Needs of African Countries Related to Implementing the UN Framework Convention on Climate Change and the Paris Agreement

AFRICAN DEVELOPMENT BANK GROUP

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ACRONYMS AND ABBREVIATIONS

ADF	African Development Fund
AFAC	African Financial Alliance on Climate Change
AfDB	African Development Bank
AFOLU	Agriculture, Forestry, and Other Land Use
AGN	African Group of Negotiators
AU	African Union
BAT	Best Available Technology
BUR	Biennial Update Reports
CC	Climate Change
CCAP	Climate Change Action Plan
CIF	Climate Investment Fund
COP	Conference of Parties
CSP	Country Strategy Paper
DoP	Date of Publication
GCF	Green Climate Fund
GEF	Global Environment Facility
GHG	Greenhouse Gas
GIZ	German International Development Agency
IEA	International Energy Agency
ILP	Indicative Lending Program
IOP	Indicative Operational Program
ISTA	Institute of Applied Technology, Project Planning, and Evaluation
KCA	Key Category Analysis
LEDS	Low Emission Development Strategy
MRV	Monitoring, Reporting, and Verification
NAP	National Adaptation Plan
NC	National Communication
NDC	Nationally Determined Contributions
PA	Paris Agreement
RIPos	Bank Group Regional Integration Policy And Strategy
RISP	Regional Integration Strategy Paper
SCF	Standing Committee on Finance
SDG	Sustainable Development Goals
SoW	Scope of Work
TNA	Technology Needs Assessment
UA	Unit of Account
UNDP	United Nations Development Programme
UNFCCC	United Nations Framework Convention on Climate Change

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EXECUTIVE SUMMARY

This report provides an account of available information and gaps on determining climate finance needs of African countries to fulfill the UNFCCC and Paris Agreement. A desk review of African Development Bank's documents covering all 54 member states and stakeholder consultations provided the basis for the determination of needs in five principal thematic areas: technical and technological needs, adaptation, mitigation, climate financing environment, and capacity building (including institutional strengthening and reform). Needs were further broken down into regional and sectoral classification, where possible. Quantitative needs were estimated as the difference between the total cost of projects or financial requirement and explicitly reported commitments by the African Development Bank or other co-financing sources. Qualitatively expressed needs were also reported. Methodologies and assumptions used for determination of needs were also identified and analyzed.

It should be noted that the determined needs are based on the available data and information obtained from the reviewed Bank's documents at the time of preparation of this report, and should not be considered conclusive or exhaustive of actual needs. The values determined may not necessarily reflect the actual needs of African countries in real-time, and should be regarded as indicative and complementary to the needs estimated by other reports. A list of all the reviewed documents is presented in Annex 1 - Description of Sources of Information for Determination of Needs, in order to avoid double counting with numbers in other reports. Based on the identified needs, gaps and opportunities, the Bank shall take into account the COP guidance on the first report on the determination of needs of developing countries to improve the structure and parameters of its data collection system for future reports.

As the main development bank in Africa, the Bank has a clear comparative advantage in representing the needs of African countries, and implementing climate action in the continent. The Bank plays a key role as a financier and partner to its Regional Member Countries (RMCs) to help them, alongside its partners, improve access to available resources as well as capitalize on future financing options. The Bank currently hosts 7 Trust Funds that directly address climate change issues. The Bank also assumes the role of a knowledge hub and an advocate of African Countries' development, capitalizing on its continental influence for comprehensive stakeholder engagement with multiple stakeholders such as the African Union (AU) and African Group of Negotiators (AGN). Through its branched network of partners, rigorous stakeholder engagement and its structural capacity to conduct data collection and management, analyses, studies, and knowledge generation/competency building for its member countries, the Bank can be in a position to act as the most suitable hub in the needs determination process of African countries.

Technical and Technological Needs

Technical and technological needs extrapolated for the time frame 2020-2030 from Indicative Operational Programs (IOPs) amount to $0.69 billion[1] for Northern Africa ($0.017 billion), Western Africa ($0.47 billion), and Central Africa ($0.2 billion). In the case of Eastern Africa, the IOP costs were fulfilled by the Bank. To complement incomplete data, Country Strategy Papers were reviewed for the Southern Africa region. Malawi's country strategy paper reports needs for upscaling technologies in the agriculture, water, and energy sectors. Mozambique's country strategy paper reports technical assistance for a windfarm amounting to $0.8 million (UA 0.6 million) and three knowledge products relevant to natural resources and agriculture sectors amounting to $0.5 million (UA 0.36 million) and $0.03 million (UA 0.02 million), respectively. Mauritius's Country Strategy Paper reports on technical assistance for analytical work to inform on energy policies, climate resilient transport infrastructure, spatial analysis of land use systems and potential environmental threats.

Adaptation needs

Total cumulative adaptation costs for African countries, based on the Africa NDC Hub, for the period between 2020 and 2030 are estimated to be between $259 to $407 billion. Assuming the ratio of international to domestic commitment remains constant at 64% to 36%, the adaptation financing needs (gap) in Africa is projected to range from $160 billion to $260 billion for the period 2020 to 2030. The sectoral adaptation needs for the top five priority sectors include Agriculture ($9-14 billion), Water ($6.7-10.5 billion), Health ($4.48-7 billion), Energy ($4.48-7 billion), and Biodiversity and ecosystems ($4.48-7 billion). On the regional level, adaptation needs (i.e., financing gap) were estimated to range from $47-74 billion for Western Africa, $58-91.5 billion for Eastern Africa, $21.5-34 billion for Northern Africa, $16-27 billion for Southern Africa, and $3.8-12.2 billion for Central Africa between 2020 and 2030. It should be noted that there are potential extra costs related to resilience-building to future climate risks over the lifetime of a given investment (i.e., uplift costs) which add up to 10% in some sectors, costs of programming (including Environmental & Social safeguards) and implementation, which could add up to 20% of the total costs, and the lack of consideration of the short-term economic effects of extreme weather events. As a result, estimated needs derived from currently reported data are likely to be underestimated.

Mitigation Needs

Mitigation needs determined based on Africa NDC Hub[2] for Africa were estimated to be $715 billion ($0.715 trillion) between 2020 and 2030. On a regional level, needs derived from RISPs amount to $7.12 billion for Eastern Africa[3], $1.96 billion for Central Africa, and $2.81 billion for Western Africa. On a sectoral level, needs extrapolated from regional

[1] It is noteworthy that calculated needs are likely underestimated due to the mismatched coverage periods of Indicative Operational Programs, incomplete cost estimation of some projects (Northern Africa), and the unavailability of a recent IOP for Southern Africa.
[2] The analysis was performed on the basis of 44 countries
[3] Values reported may be underestimated due to incomplete determination of costs for two energy projects relating to interconnection project in Eastern Africa.

integration strategy papers amounted to $11.9 billion[4], where $7.2 billion and $4.7 billion in the energy and transport sectors, respectively. Sectoral mitigation needs determined from IRENA Database amount to $454 billion for energy sector. Needs derived from African Economic Outlook range from $350-500 billion for energy, and $350-470 billion for transport; needs derived from Light-Up and Power Africa range from $420-670 billion for Energy.

Loss and Damage Needs

The projected loss and damage costs for Northern, Southern, Eastern Western, and Central Africa between 2020 and 2030 ranges from $289.2 billion to $440.5 billion[5] in the low and high warming scenarios[6], respectively. Regional needs for the same period 2020-2030 were estimated to be $82-128.5 billion for Western Africa, $78.5-131 billion for Eastern Africa, $64.2-85 billion for Northern Africa, $29.2-47 billion for Southern Africa, and $35-49 billion for Central Africa. It should be noted that the determined needs are based on the available data reported in the African Development Bank's documents, and should not be considered conclusive or exhaustive.

Climate Finance Environment Needs

One of the main needs identified is increasing and diversifying financing sources, namely via private sector engagement and international co-financing sources. The need to provide attractive financing environment was recognized in various Bank's reports, and were reported qualitatively in regional strategies. The reported needs included increasing co-financing by introducing risk-sharing instruments, introducing blending instruments, and needs for co-financiers and partnerships to improve the preparation process of bankable projects.

Capacity Building Needs

Capacity building needs were outlined as projects in indicative operational programs selected according to the Bank's selection and prioritization guidelines as well as through stakeholder consultations. Capacity building requirements were reported for Eastern, Central and Western Africa in their respective indicative operational programs in regional strategy papers, however, commitment by the Bank and other co-financiers covered the costs of associated projects.

Monitoring, Reporting, and Verification (MRV) Needs

Needs for Monitoring, Reporting, and Verification of progress on climate change were also identified. Estimates were determined as the difference between the total costs needed for

[4] Values reported may be underestimated due to unavailability of current Regional Integration Strategy for Southern Africa

[5] The costs for the period 2020-2030 were estimated via interpolation, based on the costs of L&D projected and reported in the AfDB published report on the climate change impacts on Africa's Economic Growth (2018), which projected L&D costs as percentage of GDP by 2050.

[6] Low and high warming scenarios correspond to less than 2 and more than 4 degrees increases in global average temperatures, respectively

fulfilling the MRV requirements as per the PA, and the support received by some African countries. Based on average costs referenced from GEF and African Development Bank's documents, MRV needs by 2030 were estimated at $258 million for reports preparation support (50 countries for NAPs, and 54 countries for BTR/NC reports), $46.5 to 93 million for MRV capacity building (31 countries). An example of the infrastructure needs for MRV system implementation in the electricity sector in one African country showed a need of approximately 1 Million $.

Methodologies and underlying assumptions

Common methodologies and approaches and underlying assumptions identified include lessons learned from the Bank's previous operations and results of performance reviews, consultative and stakeholder engagement processes at the national and regional levels, Bank studies and assessments aligning goals and priorities for regional, continental strategies, and national development goals strategically and operationally, and extrapolations and projections to overcome data gaps in estimating costs for adaptation and mitigation. Common underlying assumptions used for the determination of needs are based on socio-economic development indicators and physical parameters.

Gaps and Challenges for Determination of Needs

The identified gaps and challenges in determining needs include lack of standard verification of the reported data in the NDCs as highlighted in Africa NDC Hub's reports, where estimates are based on information disseminated by countries at will, thus increasing uncertainty levels in the collected data. Another identified gap is the lack of common methodologies adopted in determining needs in NDCs, which result in difficulty in aggregating the collected data (i.e. comparability challenges).

The extrapolation methodology adopted in estimating total adaptation and loss and damage needs for all African countries underline gaps and challenges including lack of sufficient quantitative data from different sectors to determine needs for all African regions/countries[7]. As a result, estimated needs derived from currently reported data are likely to be underestimated.

In regards to mitigation costs, needs are estimated based on current costs of technologies and future projections that add uncertainty to the estimations. Due to the evolution of technologies, and changes in cost over few years, one of the challenges in determining mitigation costs is the need for timely multiple re-estimations in order to update the estimated costs based on newly reported/analyzed data or information (i.e., time and capacity challenges).

With respect to developing an enabling environment for climate finance, most reports express the need for private sector investment as a key source of financing for climate related projects; however, few emphasize the need for national level MRV of climate

[7] AfDB (2020). Climate Change Impacts on Africa's Economic Growth. Available at https://www.afdb.org/en/documents/climate-change-impacts-africas-economic-growth (accessed: August 2020)

financing. Adequate standardized systems allow tracking and mapping of flows, which can help identify opportunities and/or inefficiencies to further improve the financing strategy. Furthermore, market-based barriers and the need for associated mitigation approaches such as risk sharing instruments are predominantly reported.

With respect to capacity building, a number of projects explicitly mentioned capacity building and institutional strengthening relevant to climate change issues. The predominant reporting of capacity building needs, however, were relevant to the context of improving socio-economic conditions, economic governance, trade, policy reforms, developing and encouraging private sector engagement. While indicators and targets cross-cutting with climate change are clearly expressed, associated capacity building needs such as trainings are not presented. One reason may be related to the generalized descriptions of capacity building needs and expected outcomes, where insufficient data precludes translation into projects and quantifiable terms. For example, one of the principal factors influencing training cost estimates is scale (e.g. number of trainees, institutions, regional and national levels etc.), which require defining for accurate cost determination.

Opportunities for Determination of needs

Despite the challenges, opportunities to improve the needs determination process were identified.

Challenges related to estimation of costs for mitigation, adaptation, and loss and damage highlight the need for technical/technological assistance and capacity building to improve climate-related knowledge production and management e.g. climatic information, early warning systems for improved accuracy, completeness, and comparability of determined needs.

Estimated needs on adaptation are derived from currently reported data in the Bank's documents, and are likely to be underestimated. The first step in estimating costs related to adaptation is the assessment of a country's vulnerability and readiness level. Findings from the reviewed documents reveal that one country, Malawi, explicitly reports in its country strategy paper on using a vulnerability and readiness assessment model (ND-GAIN).

Mitigation needs require common methodologies to overcome comparability and completeness issues, reduce uncertainty of reported data, and provide common approach for identifying and tracking mitigation financing in all African countries. The needs also require systematic re-estimations in order to update the estimated costs based on updated data. Estimation of climate-proofing costs of the Bank's ongoing operations is also needed to achieve the Bank's target of reaching 100% climate-proofed operations by 2020, and reflect the real needs of African countries to address climate change.

For an enabling environment for climate finance, the challenges highlight the needs for plans or assessment studies for capacities and knowledge to develop diversified strategies.

For example, a systematic approach for mixing of instruments and solutions such as blending in order to access and deliver climate finance.

On the capacity building front, for improving the climate finance environment, needs include improving country readiness in the determination of financing needs of climate actions, and formulation of bankable projects as well as monitoring and evaluation of projects progress. The ability to access and deliver finance involving the use and mixing of financial solutions, which are not comprehensive or systematic is another area for capacity building. The analysis of reviewed reports revealed that public finance management is a key area for capacity building. Moreover, capacity building should also include national level MRV of climate financing, which would include both public and private financing. Furthermore, capacity building is needed to improve estimation of costs for adaptation and loss and damage. Considering that most countries have national institutions responsible for climate change, capacity building needs for raising awareness on availability and use of tools such as vulnerability and readiness assessment indices can support detailed identification of needs.

1 INTRODUCTION

In its 24th session, the UNFCCC Conference of the Parties (COP) requested, through its decision 4/CP.24, paragraphs 13 and 14, the Standing Committee on Finance (SCF) to prepare a report every four years on the determination of the needs of developing country Parties related to implementing the Convention and the Paris Agreement. The report will inform the annual COP negotiations in its 26th session on elements regarding climate finance and the support mechanisms available through the UNFCCC. In order to prepare the report, the SCF is also requested to collaborate, as necessary, with all the financing operating entities of the Convention's Financial Mechanism including the subsidiary and constituted bodies, multilateral and bilateral channels, and observer organizations.

According to the Convention and Paris Agreement, finance flows from Developed Countries to Developing Countries shall be provided based on a country-driven assessment of the needs of developing countries. In accordance with the principle of "common but differentiated responsibility and respective capabilities, in the light of different national circumstances" set out in the Convention, the first step for accessing different finance options is identifying the role of developing countries. This role includes assessing needs based on current capacity and national context, tracking and monitoring of climate finance flows on national level, as well as reporting on the support both requested and received (as per COP 24 Decision 18/CMA.1).

The objective of this assignment is to provide an account/evidence of available information and gaps on climate finance, technological and capacity building needs of African countries to fulfill UNFCCC and PA. Moreover, the objectives include identifying the basis for identified needs, i.e., approaches and methodologies, and lack thereof, analyzing and comparing methodological processes including underlying assumptions, scope, time frame among other criteria. Furthermore, the objectives include defining advantages, disadvantages, gaps and associated implications on the outcome including limitations and potential opportunities.

The report starts by presenting the sources of information identified and considered in the desktop review in Section 2, followed by the available information and data related to the determination of climate change needs of African countries in the reviewed sources/documents. The presented information include the identified key thematic areas (mitigation, adaptation, capacity building), scope of needs, reported sectors, as well as quantified or unquantified needs. Afterwards, Section 3 analyzes the methodologies, approaches, and underlying assumptions deduced from the reviewed documents, and discuss their advantages, disadvantages, and implications on the needs determination process. The report finally identifies and analyzes the identified methodological gaps, challenges and opportunities relevant to the determination of needs.

1.1 Background: Africa and Climate Finance Support

The African continent is the world's second-largest and second-most populous continent after Asia. It is around 30.3 million km^2 in size, and it covers 20% of the Earth's land area. It contains 54 sovereign countries divided geographically into 5 main regions: Northern Africa, Southern Africa, Eastern Africa, Western Africa, and Central Africa. Africa has the youngest and fastest growing populations in the world, with more than 77% of its populations under the age of 35. Over the last decade, Africa's population under the age of 20 increased by 25.6 percent, the fastest rate recorded to date, compared to declining rates of 0.8% and 4.1% in Asia and Latin America respectively[8]. By 2050, two in every five children in the world will be born in Africa, and the urban population is expected to triple, reaching 1.34 billion. The projected regional contribution to the total increase in urban population between 2000-2060 is illustrated in Figure 1-1, with North Africa assuming the highest contribution. The growth of the urban population requires Africa to sustain substantial levels of investment to ensure strong and sustainable growth over the next decades, while reducing the contribution of its expanding cities to climate change.

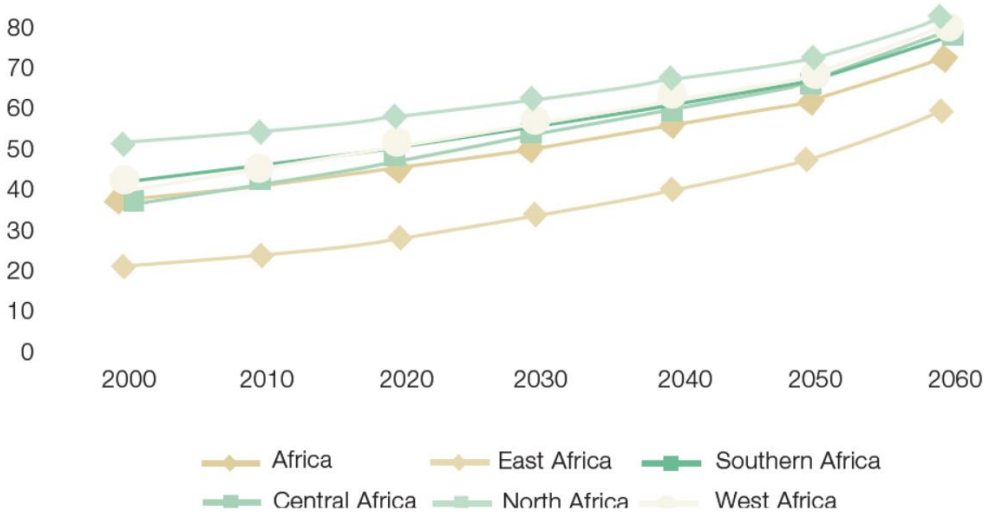

Figure 1-1 contribution of population increase by region in Africa 2000-2060

Much of the continent faces common development and social challenges albeit to varying degrees. Challenges include infrastructural weaknesses in key sectors such as energy, transport, water supply and sanitation, poverty and food insecurity, unemployment, gender disparity, institutional weaknesses, poor economic governance, and vulnerability to climate change impacts.

With respect to climate change, Africa contributes less than 4% of global GHG emissions. However, Africa is among the most vulnerable continents to climate change[9], with seven

[8] African Economic Outlook 2020. AfDB.Available at https://www.afdb.org/en/documents/african-economic-outlook-2020 (accessed: 5 December, 2020)
[9] The IPCC's Fifth Assessment Report | What's in it for Africa?. 2014. Climate and Development Knwoledge Network. Available at https://cdkn.org/wp-content/uploads/2014/04/AR5_IPCC_Whats_in_it_for_Africa.pdf (accessed: September 2020)

of the global top 10 countries that are most vulnerable to climate change being in Africa. In 2015, four African countries ranked among the 10 countries most affected: Mozambique (1st), Malawi (3rd), Ghana and Madagascar (8th). The risks of climate change pose direct and indirect threats on the lives of African people and sustainable development aspirations in Africa. It has resulted in extreme weather events, droughts and variability in rainfall affecting the largely rain-fed agricultural systems throughout the continent, thereby contributing to food insecurity, poverty, loss of livelihoods, and damaged infrastructure. The economic impacts of climate change in Africa are projected to be the most drastic, reaching up to 4.7% of Gross Domestic Product (GDP) each year by 2050, compared to other regions such as Latin America (3.8%), Middle East (3.7%), Eastern Europe (3%) and Asia-Pacific (2.6%). The economic impacts of climate change are expected to exacerbate the financial pressures on African governments' resources adding to the economic instability and fragility, vulnerability to economic shocks, lack of product diversification and the recent adverse economic impacts of the COVID-19 pandemic. In light of that, the availability and access to climate financing are essential to achieve the goals of the Paris Agreement to secure a low carbon development future that does not sacrifice development priorities and needs, and rather relies on climate-resilient economic and social systems. Currently, the demand for climate financing in Africa substantially exceeds the existing financial flows from all sources, posing challenges to increasing funds mobilization.

To facilitate the provision of climate finance globally, various sources, instruments and channels were put in place by the UNFCCC as highlighted in Figure 1-2. Most of these multilateral climate funds adopt a range of financing instruments, including grants, debt, and equity sourced from governments, other multilateral or bilateral donors, or the private sector. On a global scale, climate finance flows from both public and private sources reached $579 billion in 2017/2018, which represents a 25% increase from 2015/2016 as illustrated in Figure 1-3. The global increase was driven by deployment of more renewable energy projects, as well as increased international commitments on land use and resource efficiency[10].

[10] Global Landscape of Climate Finance 2019. Climate Policy Initiative. Available at https://www.climatepolicyinitiative.org/wp-content/uploads/2019/11/2019-Global-Landscape-of-Climate-Finance.pdf. (accessed: September 2020).

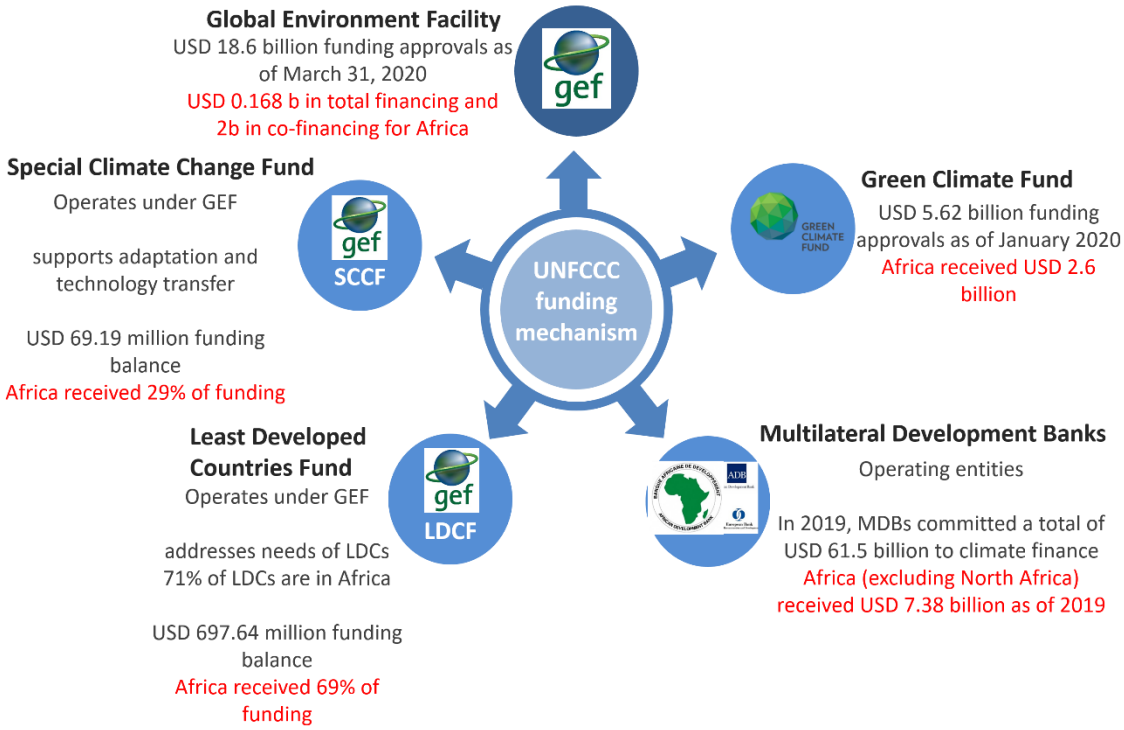

Figure 1-2 UNFCCC funding channels

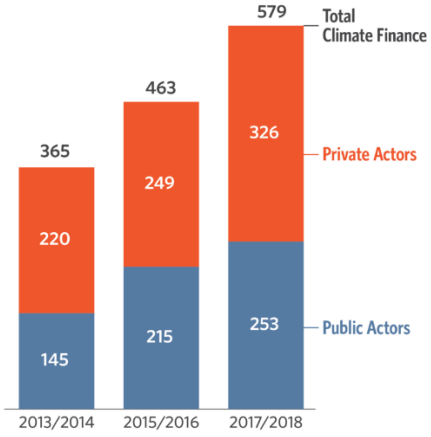

Figure 1-3 Global climate flows by private and public sources from 2013-2018 (source: Climate Policy Initiative)

With regard to geographic allocation, approximately 61% of climate finance goes to developing countries. East Asia and Pacific region is the principal recipient of developing country climate finance flows, accounting for almost 41% of total flows. It is then followed by Latin America and Caribbean, then Sub-Saharan Africa as illustrated in

Figure 1-4. Overall, Sub-Saharan Africa currently receives a third of the funding it needs for achieving sustainable development, and appropriately address adaptation and mitigation needs.

Figure 1-4 Geographic allocation for global finance flows from public and private sources in $ billion (Source: Climate Policy Initiative)

1.2 African Development Bank's Support for Climate Action in Africa

The African Development Bank is the main financing development Bank in the Africa. Having recognized the dual nature of climate change impacts, on the one hand posing threats and vulnerabilities, but also, offering opportunities for green growth and climate resilience, the Bank has made climate change considerations a core priority in its strategies and financing.

The key role of the African Development Bank includes being a primary financier and partner to its Regional Member Countries, knowledge broker and capacity-building provider, and advocate of Africa's development needs, as illustrated in Figure 1-5.

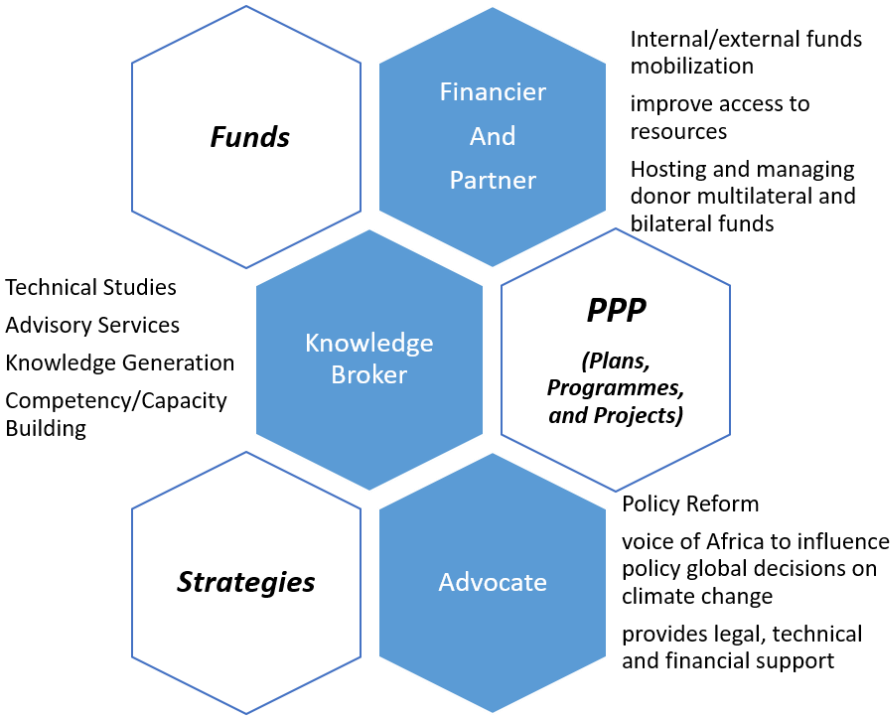

Figure 1-5 Key role of AfDB in advancing climate action in Africa

The Bank plays a key role as a financier, partner to its Regional Member Countries (RMCs) to help them, alongside its partners, improve access to available resources as well as capitalize on future financing options. The Bank currently hosts 7 Trust Funds that directly address climate change issues, and 7 other funds addressing areas indirectly related to climate change. Funds are sourced from governments, multilateral or bilateral donors, as well as private sector or philanthropic donors. As the main development bank in Africa, AfDB has a clear comparative advantage to other MDBs in implementing sustainable operations in the continent, particularly in areas such as infrastructure, clean and renewable energy, sustainable transport, smart agriculture and integrated land and water management.

As a knowledge broker and an advocate of African Countries' development, the Bank developed and launched numerous initiatives, strategies, programmes, and projects in order to advance the integration of climate change considerations into its operations and scale up its climate investments in African countries. For example, the Strategy of Climate Risk Management and Adaptation (CRMA) aims to climate-proof investments, increase support for capacity building of African countries, and reduce vulnerability to climate change while boosting African economic growth. To date, the Bank has developed two strategic Climate Change Action Plans (CCAP) covering periods from 2011-2015 and 2016-2020 to support African countries in addressing climate change impacts on financial, technical, technological, and institutional levels.

The Bank also provides advisory services, Policy Reform & Knowledge Generation/Competency Building. For example, the Bank launched ClimDev-Africa programme, which aims to enhance the provision of adequate climate and weather services in Africa, and strengthen the capacities of Africa's climate institutions to be able to generate

and widely disseminate appropriate, useful and timely climate information. As knowledge hub through its Climate Safeguards System (CSS) the Bank assists project teams in assessing and addressing climate risks in their operations. The CSS includes a tool for climate risk screening in sectors that are highly vulnerable to climate change, a screening manual, and an Adaptation Review and Evaluation Procedures (AREP). Furthermore, the regional office for the Global Center on Adaptation Africa was recently established at the Bank. In addition to the continental strategies, the African Development Bank developed national and regional frameworks, (e.g. country strategy papers and regional integration strategies) in order to guide its operations and advocacy to expand the pool of funds available for its member states.

Furthermore, the Bank capitalizes on its continental influence for deep and comprehensive stakeholder engagement; AfDB works closely with the Africa Union (AU), the United Nations Economic Commission for Africa (UNECA), the African Ministerial Conference on the Environment (AMCEN), as well as the African Group of Negotiators (AGN). The Bank provides the latter with legal, technical and financial support to enhance the AGN's effective representation of the continent in climate change negotiations. The Bank provides capacity building and studies to support the AGN representation of the African Common Position.

2 INFORMATION AND DATA ON NEEDS OF AFRICAN COUNTRIES

2.1 Sources of Information

Needs for African countries to implement the UNFCCC and PA were determined primarily on the basis of a desk review of AfDB documents. While relevant to the identification of needs, the analysis of African NDCs was not included in the review to avoid the duplication of work of other organizations, including the UNFCCC. Nonetheless, AfDB documents (e.g., Africa NDC Hub reports) were included in order to capture any supplementary information that may not have been covered in the NDCs analysis. The jurisdiction of the AfDB covers all 54 African member states, and therefore produces reports and studies across continental, regional, national, and sectoral levels. The studies and reports capture the economic, socio-political, developmental, and environmental contextual differences between the different African regions, as well as the unique characteristics of each member state. They provide the basis for determining the development needs and priority areas of African countries. Thus, they ensure that the Bank's operations align with national, regional, and continental strategies, and operationalize its role as a knowledge hub or broker across Africa. Notable examples of such reports include the Bank's High5 continental priority areas driving all of the Bank's operations towards sustainable economic development and social progress in Africa. Moreover, regional and country-level documents include the AfDB's Regional Integration Strategy Papers (RISP) for the 5 African regions (Northern, Eastern, Southern, Western, and Central), and Country Strategy Papers for each AfDB member state.

Descriptions of the documents reviewed with respect to purpose and objectives, scope (geographical and temporal), thematic areas (technical and technological, mitigation, adaptation, capacity building, financing environment), sectors, relevance to climate action, where applicable, methodologies and assumptions used for determination of needs, are presented in Annex 1. A summary of principle sources used for the desk review is illustrated in **Error! Reference source not found.**.

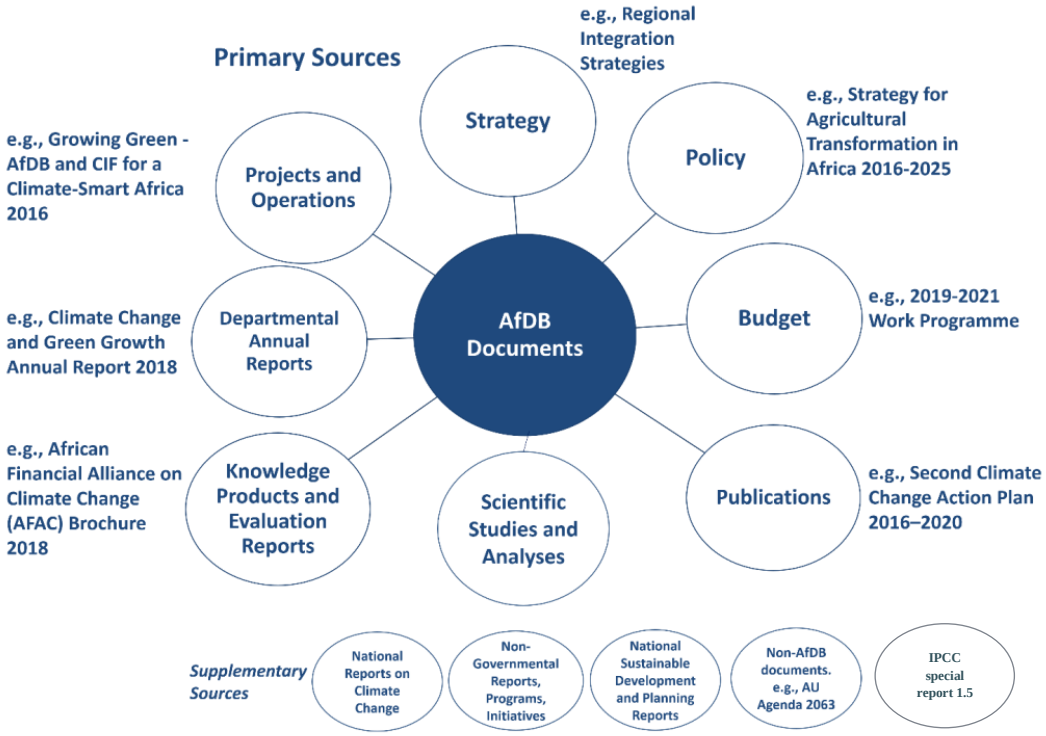

Figure 2-1: Sources of information for desk review

It should be noted that Country Strategy Papers (CSPs) for Northern Africa and Southern Africa were reviewed to complement incomplete and/or out of date regional integration strategy papers.

Northern Africa Region

Four Country Strategy Papers were reviewed, namely, Mauritania for 2016-2020, Morocco (CSP: 2017-2021; Indicative Lending Program: 2017-2019), Tunisia (CSP: 2017-2021; Indicative Lending Program: 2017-2019), and Egypt for 2015-2019; Algeria's Interim Country Strategy Paper for 2016-2018, and Libya's country note for re-engagement for 2014-2016. It should be noted that Algeria and Egypt's CSPs and Libya's re-engagement note are out dated. In the case of Morocco and Tunisia, CSPs are current; however, the timeframe of indicative lending program is outdated.

Furthermore, indicative lending programs provide lists of selected projects and activities and associated Bank commitments; co-financing needs are not consistently reported or could not be derived as total project intervention costs were not provided (to allow an estimation of needs by subtracting Bank commitments.) In selected cases, potential co-financing entities are listed.

Southern Africa Region

To estimate needs for countries in the Southern Africa region, current Country Strategy Papers were consulted for 12 countries. Three countries have updated country strategy papers covering 2020-2024, namely, Lesotho, Namibia, and eSwatini. Six countries in the Southern Region have Country Strategy papers nearing the end of their timeframe (2021-

2022). Three countries have outdated Country Strategy Papers, namely, Zimbabwe (country brief 2014-2016), Mauritius (2014-2018), and Botswana (2015-2019).

2.2 Available Information and Data on Needs

Available information and data on needs were classified according to 5 principal thematic areas: technical assistance and technologies, adaptation, mitigation, climate financing environment, and capacity building. Capacity building includes institutional strengthening and reforms.

Within each thematic area, needs are further broken down into sectoral classification, where possible, consisting of energy, transport, water supply and sanitation, information and communication technology (ICT), and Agriculture, Forestry, and Other Land Use (AFOLU) (mainly agriculture).

Needs are addressed from a qualitative and quantitative facet for each thematic area. Qualitative needs referred to herein the report consist of generally expressed requests for support for which no estimated costs and/or concrete programs and operations are provided. From a quantitative perspective, needs correspond to financing support requested, financing gaps reported or calculated on the basis of financing requirements and explicitly secured commitments by the Bank and/or other co-financing entities. Financing requirements refer to total costs of projects or programs. Bank related commitments are assumed to be secured and include regional envelope, ADB windows, ADF cycles, funds etc. Co-financing needs correspond to any estimates associated with non-Bank financing entity as potential financiers; co-financing needs are considered not secured unless explicitly stated.

2.2.1 Technical and Technological Needs

Technical and technological needs include project preparation studies such as feasibility studies, technical support programs, project development studies, project preparation support etc. Technical and technological needs are mentioned in regional integration strategy papers as projects under indicative operational programs (IOPs). Needs are estimated as the difference between total cost of projects and explicitly reported commitments by AFDB and/or other co-financing sources. Technical and technological needs for 4 regions were determined. Recent estimates for project in the Southern Africa region based on Regional Integration Strategy Paper was not available and is not included. Indicative operating programs were reported for the various regions across varying timeframes. In order to normalize and extrapolate between the 2020-2030 timeframe, a ‘per unit-based’ approach is adopted for each project outlined in an indicative operating/lending program. First, the needs were determined according to total project cost by subtracting Bank commitments for the timeframe of the Indicative Operating Program. The following step consisted of determining needs per year were determined; needs for the timeframe were then subtracted or extended to reflect 2020-2030 timeframe. To estimate needs over the 2020-2030 time frame, the financing needs of a project per year term were calculated

for each relevant project constituting an indicative operational program (IOP). Technical and technological needs were extrapolated for the time frame 2020-2030 by defining project needs/year based on the timeframe of the respective region. Resulting estimates are based on the assumptions that project types, costs and Bank commitments continue to be relevant and constant for the 2020-2030 timeframe. TT needs for 4 regions, namely, Northern Africa, Eastern Africa, Western Africa and Central Africa extrapolated for the time frame 2020-2030 amount to $0.69 billion[11]. The regional and sectoral breakdown is presented in **Error! Reference source not found.**.

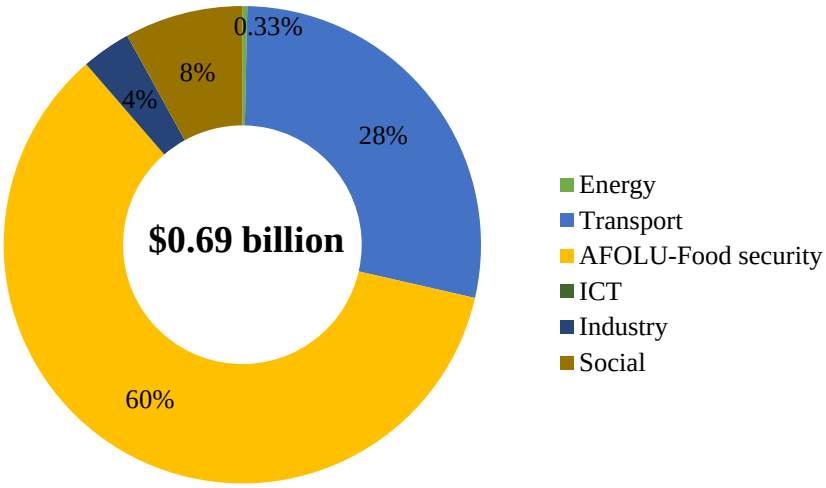

Figure 2-2: Technical and Technological needs based on IOPs (extrapolated for 2020-2030)

In the case of Eastern Africa, projects relevant to technical and technological are listed in the Indicative Operational Program, however, AfDB commitments are sufficient and no need was identified. In the case of Southern Africa, a recent strategy paper as of 2015 was not available; to represent Southern Africa, country strategy papers were reviewed and relevant needs reported, where available. Regional and Sectoral Breakdown of technical and technological needs extrapolated from current IOPs (2020-2030) are shown in Figure 2-3.

[11] All dollars ($) presented in this document are US dollars

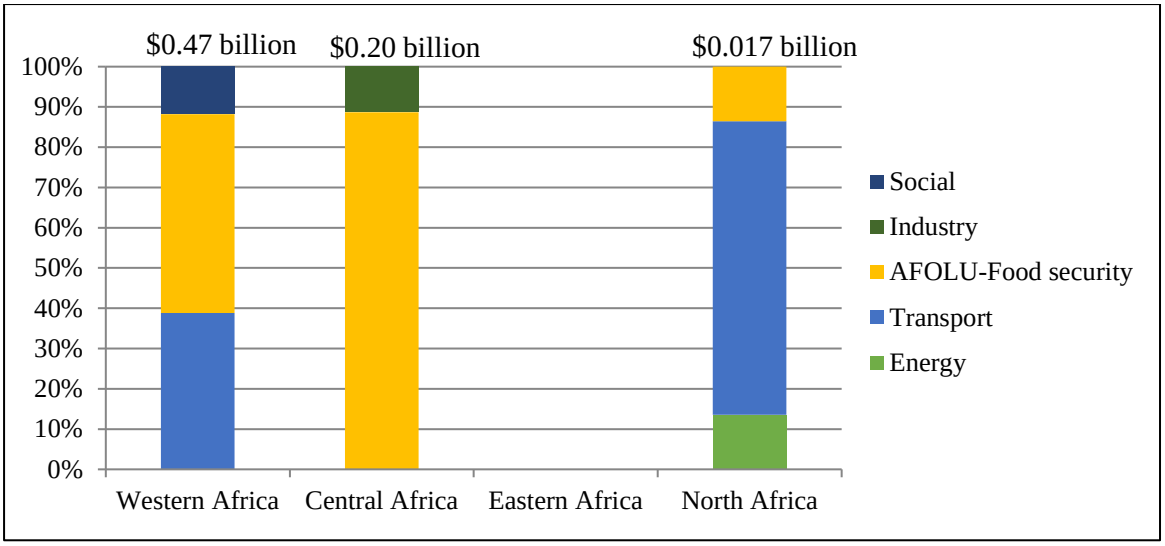

Figure 2-3: Regional and Sectoral Breakdown of Technical and Technological needs based on Indicative Operational Programs (2020-2030)

Table 2-1: Regional and sectoral breakdown for technical and technological needs

	Region				Total Needs $ Billion
Sector	**Western Africa**	**Central Africa**	**Eastern Africa**	**North Africa**	
Energy				0.0023	0.0023
Transport	0.18			0.012	0.19
AFOLU-Food security	0.23	0.18		0.0023	0.41
Industry		0.023			0.023
Social	0.055				0.0552
TOTAL	**0.47**	**0.20**	**0**	**0.01702**	**0.69**

It should be noted that calculated needs may be underestimated due to several factors; one factor is the mismatch in timeframe between current Indicative Operational Programs for the 4 regions, Western, Central, Eastern, and North Africa and for which normalization and extrapolation was performed. The estimate was calculated based on defining needs/year and multiplying with additional years or subtracting past years to normalize and extrapolate costs for the timeframe to 2020-2030. Shortcomings of the extrapolation include assumptions that projects of equivalent costs (to reported timeframe) are extended from 2022-2025 and have the same % allocation. The second factor pertains to North Africa-Regional Integration Strategy Paper, where an indicative programs consisting of projects for regional integration has not yet been developed. Another factor relevant to North Africa is ambiguity over secured and non-secured financing. In turn, a low range and high range of needs were estimated. The list of identified projects in North Africa is presented as "African Development Bank's operations that can be implemented" for which associated costs are defined as "potential technical assistance and potential loans". Potential loans include specified private entities (i.e., Blue Peak Private Capital, AfricInvest IV, EMCE Risk agreement), and are therefore assumed to be secured and excluded from reported needs. With respect to needs relevant to North Africa, the high range of estimated needs includes all projects listed (excluding the aforementioned projects with private entities

financing secured.) With respect to the low range of needs, the estimate need corresponds to two technical assistance projects explicitly mentioned as being conditional on resource availability. That said, needs derived from North Africa - Regional Integration Strategy Paper projects are underestimated and not representative of actual needs because the list of projects is not finalized. Estimates for the identified projects are nevertheless added for consistency. The third factor contributing to underestimated value is due to several projects costs not estimated. For North Africa, costs for 4 projects are not determined. In the case of Eastern Africa, the cost of one project relevant to the transport sector is not determined. The fourth factor contributing to underestimated needs is the unavailability of a recent Regional Integration Strategy Paper for Southern Africa for which needs are not considered.

Country strategy papers for Northern Africa and Southern Africa were reviewed; explicit reporting of technical and technological needs relevant to climate action is presented herein.

Northern Africa Region

Morocco's country strategy paper reports on technical assistance needs in the energy sector for promotion of energy efficiency, and in the agriculture sector for the National Wastewater Reuse Plan, and National Rural Sanitation Programme.

Egypt's country strategy paper provides a list of projects cancelled or postponed due to insufficient financing in the time frame 2016-2018. Examples include technical assistance for a feasibility study and ESIA for Abou Rawash Sludge facility in 2016. In the transport sector, the Phase II: River Nile navigation project having a total cost of $1.656 million and insufficient Middle Income Countries (MIC) Technical Assistance Fund (TAF) was not approved. Status update can inform on current needs.

Southern Africa Region

Malawi's country strategy paper reports on external support in the context of adaptation for upscaling technologies in the agriculture, water, and energy sectors. In the agriculture sector, external support relates to climate smart agriculture and irrigation. In the water sector, external support relates to water harvesting. In the energy sector, support relates to alternative technologies.

Mozambique's country strategy paper reports on one project consisting of a feasibility study for the Namacha windfarm is reported to require technical assistance categorized as 'other financing' and amounting to $0.8 million (UA 0.6 million[12]). Three projects listed as knowledge products and relevant to natural resources and agriculture sectors require other financing amounting to $0.5 million (UA 0.36 million) and co-financing amounting to $0.03 million (UA 0.02 million), respectively.

Mauritius's Country Strategy Paper reports on technical assistance for analytical work to inform on policy targets for renewable energy, climate resilient infrastructure (mass transit

[12] Units not reported and assumed to be UA million

in the transport sector), spatial analysis of land use systems and potential environmental threats.

2.2.2 Adaptation Needs

The adaptation costs for African countries, based on Africa NDC Hub's analysis of adaptation components in 48 African Nationally Determined Contributions (NDCs)[13], are projected around $7.4 billion per year until 2020. This value is at the lower end of the range provided by the United Nations Environmental Programme's (UNEP) Adaptation Gap Report of $7-15 billion/year. UNEP Adaptation Finance Gap report[14] projected that global adaptation needs in 2030 will need to be six to ten times the estimated cost for the year 2020. Africa NDC Hub assumes estimates the costs in the year 2030 at $44.4 to 74 billion to meet African adaptation needs (multiplying the $7.4 billion by 6 to 10). Therefore, assuming linear increase in cost between 2020 and 2030, the total cumulative costs of adaptation in Africa may be in the range of $259 billion to $407 billion from both domestic and international sources. The adaptation financing needs (gap) in Africa from international sources during this period may be in the range of $166 billion to $260 billion as shown in **Error! Reference source not found.**, and **Error! Reference source not found.**. This is based on the assumption that the international to domestic commitment ratio during the period 2020 to 2030 will remain the same as the year 2020: 64% of costs will come from international sources, and 36% from domestic sources. It is assumed that the portion from domestic sources is available while the needs will be for the portion from international sources. It should be noted that the determined needs are based on the available data reported in AfDB documents, and should not be considered conclusive or exhaustive of actual needs.

The UNEP Adaptation Finance Gap Report 2016 estimated that global adaptation costs are projected to be between $140 billion to $300 billion per year by 2030. The estimated annual costs in 2030 in Africa is estimated between $44.4 billion to $74 billion, which represents approximately 30% of the global adaptation costs. It should be noted that the share of Sub-Saharan African from international public adaptation finance was 16% in 2016 according to the same UNEP report.

Since the 2016 UNEP Adaptation Finance Gap Report there have been additional studies and evidence, but no new global adaptation cost assessments or synthesis have been produced. However, according to the UNEP Adaptation Gap Report 2018[15], there are various elements besides the cost of the adaptation measures that need to be accounted for in order to estimate the actual total adaptation costs needed. For example, the climate-risk

[13] Africa NDC Hub, 2019. Analysis Of Adaptation Components Of Africa's Nationally Determined Contributions (NDCs). [online] African Development Bank. Available at: <https://www.afdb.org/fileadmin/uploads/afdb/Documents/Generic-Documents/Analysis_of_Adaptation_Components_in_African_NDCs_2019.pdf> [Accessed 1 July 2020].

[14] UNEP 2016. The Adaptation Finance Gap Report 2016. United Nations Environment Programme (UNEP), Nairobi, Kenya

[15] United Nations Environment Programme (UNEP), 2018. *Adaptation Gap Report*. [online] UNEP. Available at: <https://www.unenvironment.org/resources/adaptation-gap-report> [Accessed 8 September 2020].

screening by Multilateral Development Banks may highlight additional costs/needs related to resilience-building to future climate risks over the lifetime of a given investment (i.e., uplift costs). This will likely increase the total adaptation costs needed significantly. The uplift costs can reach up to 10% in some sectors (e.g., road sector). In addition, programming and implementation costs of adaptation measures can be significant. The additional costs of design (including E&S safeguards) and implementation (capacity building, project management, reporting, monitoring and evaluation, and supervision) typically range between 10% to 20% of the total costs. These need to be included in total adaptation financing needs in order to reflect the full costs of delivering adaptation measures. Moreover, the report acknowledges new evidence of the short-term economic effects due to extreme weather events, which are usually poorly analyzed or included in the estimation of total adaptation costs. Such economic losses are rising year after year and has reached a global soaring value of $300 billion in 2017. Therefore, with similar recurring events, larger impacts may be expected, and hence further costs will be needed in order to capture economic losses and ensure effectiveness of adaptation measures. The aforementioned elements further cement that the adaptation finance gap persists, and it is likely to be larger than the estimated amounts. These amounts, however, can provide good indicative values to the minimum range of costs needed for adaptation.

Table 2-2: Estimation of Adaptation costs until 2030

Adaptation needs for NDC implementation	**Annual cost in 2020 ($ billion)**	**Annual cost in 2030 (6-10 X)**	**Annual average during 2020-2030**	**Cumulative 2020-2030**
	7.4	44.4 - 74	25.9 – 40.7	259 – 407
International support (64%)	4.7	28.4 – 47.36	16.6 – 26	**166– 260**
Domestic support (36%)	2.664	16 – 26.64	9.3 – 14.6	93.2 – 146.5

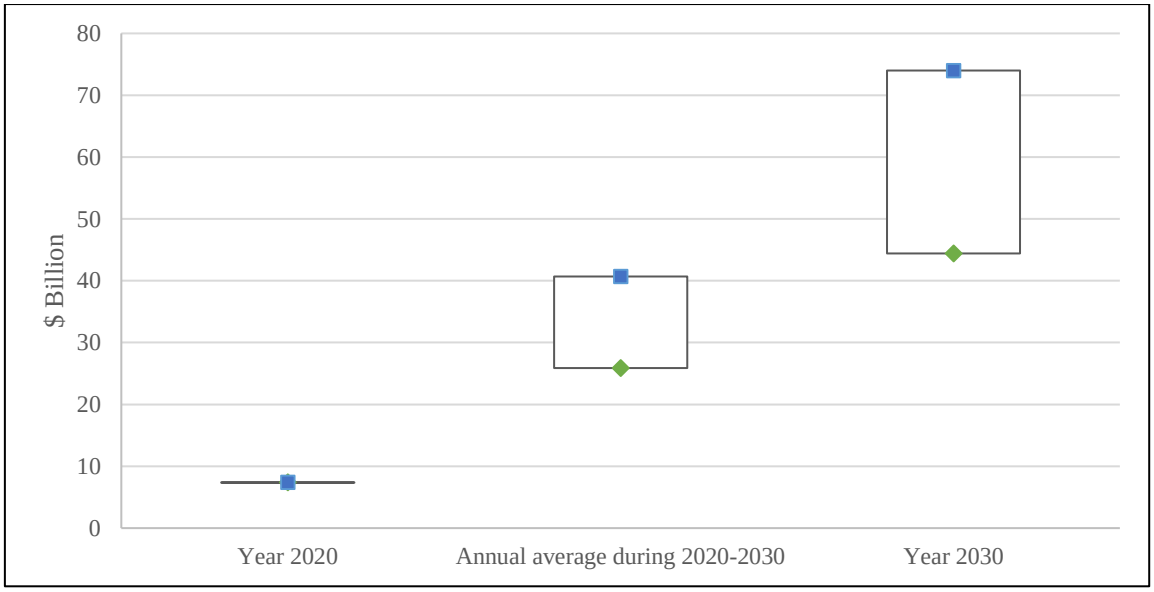

Figure 2-4: Adaptation finance needs in Africa in $ billion per year

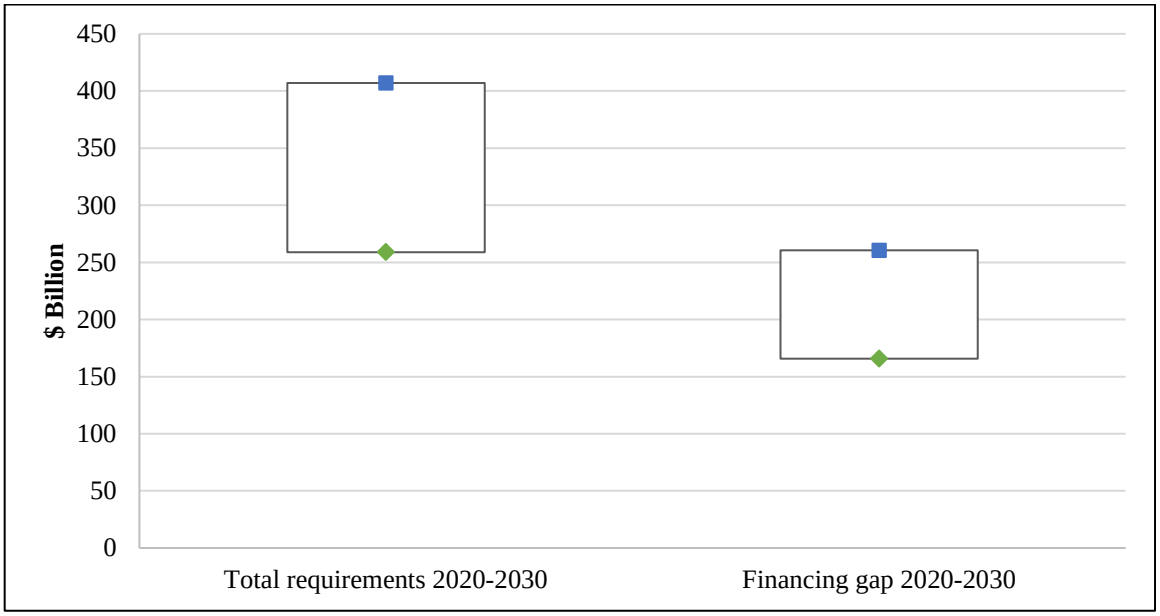

Figure 2-5: Total adaptation financing requirements and gap between 2020-2030

It should be noted that the share between domestic: international financing is suggested as 36%:64%[16] based on data for 9 countries only and may therefore not be representative of the actual circumstances of the rest of the countries. The needs from domestic sources also do not include allocations in national budgets or national development plans, which suggests total needs from domestic sources are likely higher.

As for sectoral needs, Africa NDC Hub's Analysis of Adaptation Components in African NDCs report estimated the projected annual adaptation needs for the five top priority

[16] Africa NDC Hub, 2019. Analysis Of Adaptation Components Of Africa's Nationally Determined Contributions (Ndcs). [online] African Development Bank. Available at: <https://www.afdb.org/fileadmin/uploads/afdb/Documents/Generic-Documents/Analysis_of_Adaptation_Components_in_African_NDCs_2019.pdf> [Accessed 1 July 2020].

sectors as shown in **Error! Reference source not found.** and illustrated in **Error! Reference source not found.**. The same assumptions apply for the increase needed by 2030 (6 to 10 times increase in 2030 compared to 2020 costs) and for the international and domestic resource commitment (64% to 36%, respectively).

Table 2-3: Estimated sectoral adaptation needs between 2020-2030

Sector	**2020 ($ billion)**	**2030 ($ billion)**	**2020-2030 ($ billion)**		
	Annual cost in 2020	**Annual cost in 2030 (6-10X)**	**Annual average during 2020-2030**	**Cumulative 2020-2030 ($ billion)**	**Amount needed from international resources ($ billion) (64%)**
Agriculture	0.4	2.4 – 4	1.4 – 2.2	14 - 22	**9 - 14**
Water	0.3	1.8 – 3	1.05 – 1.65	10.5 – 16.5	**6.72 – 10.56**
Health	0.2	1.2 – 2	0.7 – 1.1	7 – 11	**4.48 – 7**
Energy	0.2	1.2 – 2	0.7 -1.1	7 – 11	**4.48 – 7**
Biodiversity and ecosystems	0.2	1.2 – 2	0.7 – 1.1	7 – 11	**4.48 – 7**
Total costs for top 5 priority sectors	1.3	7.8 – 13	4.55 – 7.15	45.5 – 71.5	**29.16 – 45.56**

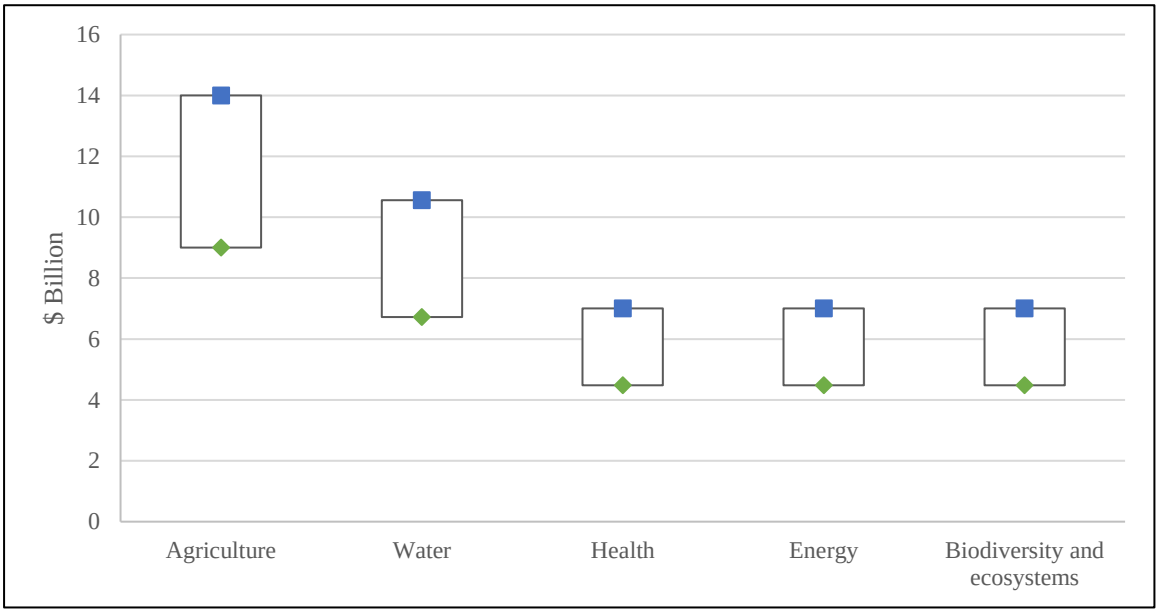

Figure 2-6: Total Adaptation Needs from international sources between 2020-2030 for priority sectors identified by NDCs

It is important to highlight the discrepancy in the total and sectoral adaptation costs reported by the Africa NDC Hub where the annual adaptation costs reported for 2020 are $7.4 billion and the sectoral costs for the top five priority sectors are $1.3 billion for the same reference year 2020. This amounts to about 18% of total adaptation costs needed for that year.

With respect to regional adaptation needs, the Africa NDC Hub Analysis of Adaptation Components in African NDCs projected annual adaptation costs for the five regions by 2020, amounting to $6.6 billion. It should be noted that the discrepancy between this figure and the $7.4 billion reported as total projected annual adaptation cost for 2020 may be due to the absence of an estimated total for Central Africa. The report included country-specific adaptation costs reported from 28 NDCs. Three Central African countries were included in the report: Cameroon, Central African Republic, and Chad, amounting to $0.175 billion per year for adaptation. This excludes Congo, Democratic Republic of Congo, Equatorial Guinea, and Gabon.

The estimation of regional adaptation costs was based on the same UNEP and Africa NDC Hub assumptions defining the projected increase needed in adaptation costs by 2030 (6 to 10 times increase in 2030 compared to 2020 costs) and the international and domestic resource commitment (64% to 36% respectively). **Error! Reference source not found.** provides the cumulative regional adaptation costs needed from international sources between 2020-2030, which are illustrated in **Error! Reference source not found.**.

Table 2-4: Regional adaptation needs in Africa for 2020-2030

Sector	2020 ($ billion)	2030 ($ billion)	2020-2030 ($ billion)		
	Annual cost in 2020	Annual cost in 2030 (6-10X)	Annual average between 2020-2030	Cumulative 2020-2030 ($ billion)	Amount needed from international resources ($ billion) (64%)
Western Africa	2.1	12.6 – 21	7.35 – 11.55	73.5 – 115.5	**47 – 73.9**
Eastern Africa	2.6	15.6 – 26	9.1 – 14.3	91 – 143	**58.2 – 91.5**
Northern Africa	0.963	5.778-9.63	3.37 – 5.3	33.7 – 53	**21.5 – 33.9**
Southern Africa	0.727	4.362 - 7.27	2.5 – 4.2	25 – 42	**16 – 26.8**
Central Africa[17]	0.175	1.05 -1.75	0.6 – 1.9	6 – 19	**3.8 – 12.2**
Total	6.56	39.4 – 65.6	23 – 36	230 - 360	**147.2 – 230.4**

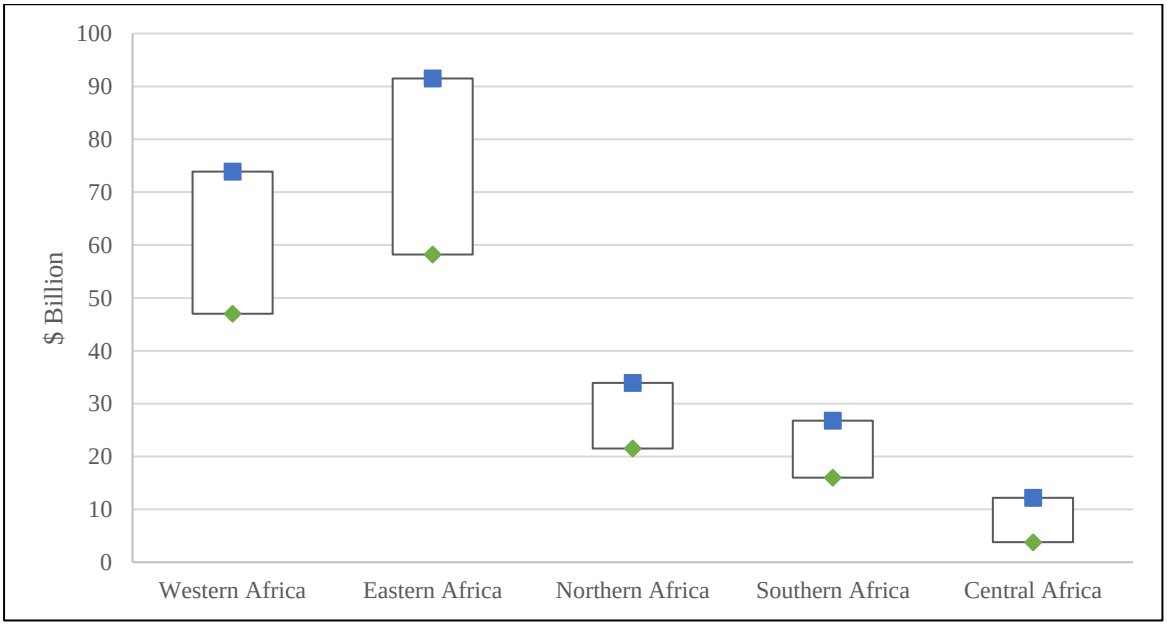

Figure 2-7: Total regional adaptation needs from international sources between 2020-2030

Adaptation needs derived from costs of projects constituting indicative operational programs in regional integration strategy papers are reported for Western Africa; the extrapolated estimate is $1.19 billion for 2020-2030. Projects relate to the Agriculture, Forestry, and Other Land Use (AFOLU) sector.

[17] This figure does not cover all countries in Central Africa, and only includes Cameroon, Central African Republic, and Chad. This excludes Congo, Democratic Republic of Congo, Equatorial Guinea, and Gabon.

Northern Africa Region

To complement data from Northern Africa and complete the review for Southern Africa, country strategy papers were reviewed. A general observation relevant to adaptation is that countries in the North Africa region (with the exception of Libya) report on vulnerability of the agriculture sector and implications on food security exacerbated by climate change impacts such as drought and variable rainfall. Needs related to interventions in the agriculture sector are covered by development of water infrastructure and technology for climate smart/resilient activities. It is also worth noting that none of the countries report on adaptation and vulnerability assessments.

Morocco's country strategy paper reports on adaptation actions in the water sector in the context water resource preservation, agricultural system and human social development. Bank commitments in 2018 for two projects on sustainable agriculture, the 'Reform Support Programme for the Development of Sustainable Agricultural Sub-sectors'**,** and promotion of agriculture value chains and entrepreneurship were $96.6 million and 69 million, respectively. Potential co-financing entities were listed but no estimates for co-financing were reported. For 2019, a Bank commitment of $69 million was reported for the project to 'Transfer Water from the North to the Centre'. Status update may inform on current needs related to those projects.

Tunisia's country strategy paper reports on increased water stress as one of the impacts of climate change with impacts on agriculture. The country strategy paper reports on government's objectives to build national disaster surveillance capacity and develop early warning systems, build national resilience and adaptation capacity. No estimates are provided. With respect to sectoral needs, the country strategy reports on government's objectives and targets relating to modernization of agriculture for food security. In 2017, the 'Small Irrigated Areas Development Project' is listed; commitments by ADB and co-financing by Africa Growing Together Fund were $41.4 and $13.8 million, respectively.

Mauritania's Country Strategy Paper reports on the agriculture sector being threatened by climate change risks, which can exacerbate shortage of food since 60% of production relies on rain-fed farming. The National Agricultural Development Plan (PNDA) for the 2015-2025 has been developed and is being implemented with the support of Technical and Financial Partners for the agricultural activities; estimates are not provided. One relevant project, the Agricultural Sector Transformation Structuring Support project financed by ADF and estimated at $9.66 million is reported. Co-financing needs are not provided.

Egypt's Country Strategy Paper climate resilient interventions are reported in the context of waste water treatment and food security in the agriculture sector. The indicative lending program includes the Canal Sugar Project, where co-financing needs of $35 million (UA 25 million) by the Africa Growing Together Fund are reported. One completed project intervention is reported, the Abu Rawash Wastewater Treatment Plant. An associated project is the Abu Rawash Sludge Facility, which was postponed to 2019. On the basis of total cost of the project and Bank commitments amounting to $63 million (UA 46 million)

and $41 million (UA 30 million), respectively, co-financing needs of $22 million (UA 16 million) were determined. Investment needs are reported qualitatively for the development of supplementary water sources and water management mechanisms for agriculture. Status update can inform on current needs.

Algeria's Country Strategy Paper reports on the vulnerability of the agriculture sector to climate change impacts such as drought. Bank support is relevant to management of water resources. The agriculture and agroindustry sectors investment project (in 2018) was listed as a new Bank operation in the indicative results matrix. No estimated costs or commitments are provided. On a national level, the Strategic Agriculture Subsectors Development Goals for 2016-2019 defines the government's strategy in the agriculture sector. Status update may inform on current needs.

Southern Africa Region

Lesotho's Country Strategy Paper reports on its vulnerability to droughts, soil erosion, deforestation resulting in the agriculture sector being mostly affected. The need for co-financing is explicitly mentioned for the 'new agriculture' project, which involves climate smart interventions. A need of $14 million (10 million UA) is reported as a financing target for the project in the financing leverage category of the performance matrix.

eSwatini's Country Strategy Paper (2020-2024) lists several strategies and plans including National strategies and plans relating to climate action National Drought Mitigation and Adaptation Plan 2016-22, National Climate Change Policy in 2016, and the National Resilience Strategy and Disaster Risk Reduction Policy and Action Plan (2017-2021), National Climate Change Policy and Strategy 2016, the National Climate Change Strategy and Action Plan (2014-2019). In the agriculture sector, a priority sector vulnerable to climate change due to drought, there are two associated projects in the Indicative Lending Program. One project relates to youth employment in the sector and the other for water augmentation scheme; both project costs are fulfilled by Bank commitments. In the water sector, climate change and water scarcity and aging infrastructure are challenges reported. A deficit between supply and demand is reported as 123 million cubic meters (supply 1,247 and demand 1,370 million cubic meters, respectively). The ILP contains one dam construction project. It is worth noting that two projects "Enhancing Readiness for Investment in Low Carbon and Climate Resilience Development Project and LUSIP irrigation project" aimed at developing mitigation measures and supported by Bank with planned dates of completion for 2019 are ongoing. Amount approved by Bank is $0.276 million.

Malawi's Country Strategy Paper reports qualitatively on the need for external support for the implementation of actions. The vulnerability of Malawi is assessed by the Notre Dame Global Adaptation Initiative (ND-GAIN). In the agriculture sector, the need for external support is qualitatively reported for adaptation measures consisting of climate smart agriculture and irrigation. While, the Indicative Lending Pipeline does not explicitly classify project operations according to adaption thematic areas, financing needs were

derived for one project in 2018 in the agriculture, the Shire Valley Transformation Programme, having a total cost of $215 million (UA 156 million.) Potential collaborating partners consist of WB, GEF and Government of Malawi, and respective commitments of $154 million (UA 111.3 million), $5 million (UA 3.9 million), and $7 million (UA 5.2 million) are reported. Assuming the co-financing by aforementioned entities is secured, needs amount to $15 million (UA 11.2 million.) Assuming co-financing are not secured, needs would amount to $182 million (UA 131.5 million.) Furthermore, the CSP references the Climate Investment Fund Strategic Programme for Climate Resilience (SPCR), where key areas for interventions relevant to adaptation are outlined; areas include climate resilient approaches to watershed management and agriculture and fisheries value chains. No estimates are provided.

Mozambique's Country Strategy Paper notes that despite having GHG emissions ranking lower than the average for Low Income Countries, according to the Global Climate Change Risk Index, Mozambique is one of the most vulnerable countries to risks of climate change such as extreme weather events (droughts, floods, tropical cyclones) and sea water level rising. The agriculture sector is particularly vulnerable; interventions relate to flood and drought control infrastructure, climate sensitive agriculture techniques and technologies, and disaster management capacity. Estimates for adaptation actions are not reported.

Angola's Country Strategy Paper reports on co-financing needs in the agriculture sector for the "Cabinda integrated agricultural project' amounting to $14 million (UA 10 million), which are planned to be secured by the Government of Angola. The second project is the "Private sector agri-business project along Lobito Corridor"; Bank commitments amount to $276 million (UA 200 million) and planned co-financing by the WB's Commercial Agricultural Development Project amounts to $317 million (UA 230 million.)

Madagascar's Country Strategy Paper reports on its vulnerability to climate change impacts such as extreme weather events including droughts and floods. The country also hosts 5% of global biodiversity. A pilot Programme for Climate Resilience was referenced in the CSP and was under preparation at the time of submission of the CSP. In the agriculture sector, seven projects including agri-business, agricultural transformation programs, biodiversity were co-financed by climate funds amounting to $249 million (UA 180.3 million) and $39 million (UA 28 million) by the private sector.

Mauritius' Country Strategy Paper reports on its vulnerability to climate change impacts including reduced rainfall, drought, extreme weather events such as cyclones, threats to ecological diversity. Climate change impacts are further exacerbated by environmental degradation. In the transport sector, the CSP reports on analytical works for the study of potential green infrastructure investments options such as climate resilient mass transport systems.

2.2.3 Mitigation Needs[18]

Africa NDC Hub's gap analysis report estimated the mitigation needs based on conditional and unconditional commitments made by 44 African NDCs for the year 2030. The baseline emissions level is estimated at 3,700 $MtCO_2eq$ in the year 2030. Based on the NDCs, 9% reduction potential can be achieved from the unconditional reduction scenario, amounting to 3,400 $MtCO_2eq$ in the year 2030. The reviewed NDCs reported additional 32% in emissions reduction that are conditional upon the receipt of international financing. This additional reduction would reduce emissions down to 2,100 $MtCO_2eq$ (42% total reduction expected from full NDC implementation) in the year 2030 as shown in Figure 2-8. Reductions from conditional NDC commitments implementation account for 77% of overall reduction.

Based on the global estimated cost of emissions reduction at just under \$100/ tCO_2eq[19], and the projected reduction potential derived from NDCs for conditional commitments amounting to 1,300 $MtCO_2eq$ in 2030 (i.e., 3400 – 2100 = 1,300 $MtCO_2eq$), the total mitigation costs requiring international resource mobilization by 2030 can be estimated as shown in Table 2-5.

Table 2-5: Cumulative annual reduction ($MtCO_2eq$) and total mitigation needs for Africa between 2020-2030

Year	**Cumulative annual reduction ($MtCO_2eq$) (130/year)[20]**	**Average cost to achieve reduction (\$billion) (annual reduction *100)**
2021	130	13
2022	260	26
2023	390	39
2024	520	52
2025	650	65
2026	780	78
2027	910	91
2028	1040	104

[18] In the case of agriculture, with respect to mitigation, relevant needs include using low carbon technologies, agroforestry, restoring degraded land and forest plantation. However, detailed information was not available to allow classification.

Continental needs in the water supply and sanitation sector are estimated at \$130 billion for 2020-2030 (assuming \$13 billion/year are needed for universal access-Improve Life Africa). Water and Sanitation activities may pertain to either mitigation and/or adaptation. Details were not available for classification.

[19] Africa NDC Hub, 2018. Gap Analysis Report: Nationally Determined Contributions (Ndcs). [online] African Development Bank. Available at: <https://www.afdb.org/fileadmin/uploads/afdb/Documents/Generic-Documents/African_NDCs_Gap_Analysis_Report.pdf> [Accessed 1 July 2020].

[20] Africa NDC Hub, 2018. Gap Analysis Report: Nationally Determined Contributions (Ndcs). [online] African Development Bank. Available at: <https://www.afdb.org/fileadmin/uploads/afdb/Documents/Generic-Documents/African_NDCs_Gap_Analysis_Report.pdf> [Accessed 1 July 2020].

2029	1170	117
2030	1300	130
Total	**1300**	**715**

Figure 2-8: Projections of emissions levels based on conditional and unconditional NDC commitments and reference baseline for the year 2030

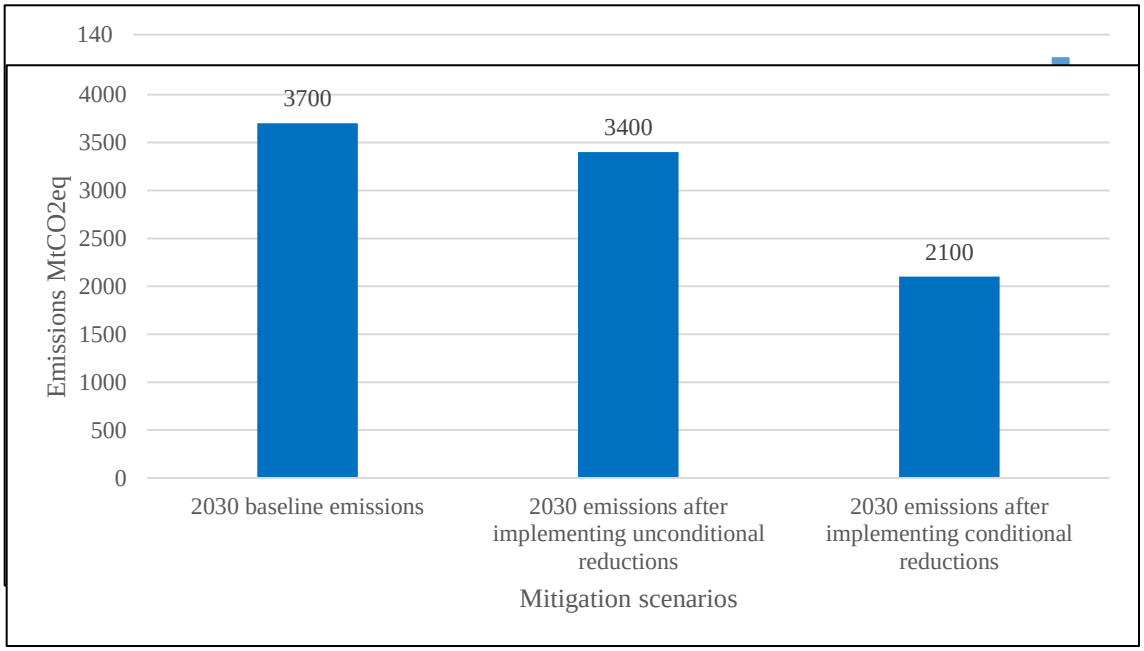

Figure 2-9: Total mitigation needs for Africa between 2020-2030

Based on the IRENA statistical database as referenced in the African Financial Alliance on Climate Change (AFAC) brochure 2018, the cumulative investment needs in the renewable energy sector between 2020-2030 for all renewable energy generation types is reported to be $454 billion ($45.5 billion annually assuming equal yearly allocation). The regional needs between 2020 and 2030 are shown in **Error! Reference source not found.** and illustrated in Figure 2-10.

Table 2-6: Mitigation needs for RE sector between 2020-2030

Region	**Annual Costs in the period 2015-2030 ($billion) (Source: IRENA as referenced in AFAC)**	**Needs between 2020-2030 ($billion)**
Northern Africa	22.8	228
Southern Africa	9.7	97
Western Africa	5.9	59
Eastern Africa	4.8	48
Central Africa	2.13	21.3
Total	**45.4**	**454**

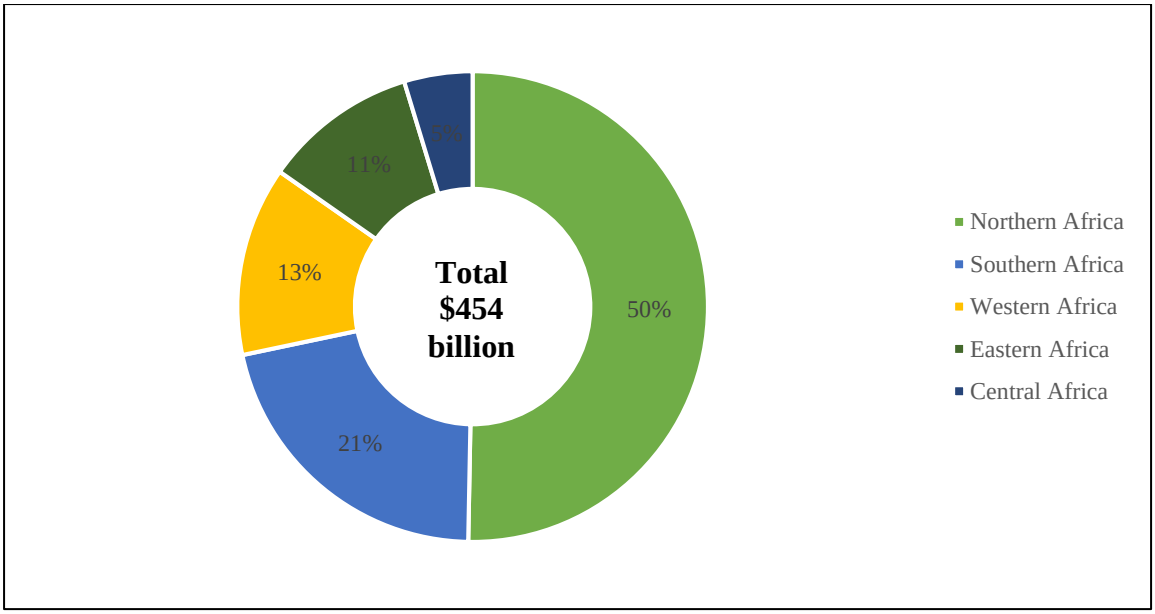

Figure 2-10: Mitigation needs for RE Sector between 2020-2030 (based on AFAC brochure 2018, IRENA database)

On a regional level, needs were determined based on indicative operational programs consisting of projects selected following a screening process by the Bank consisting of two steps. The first step pre-prioritizes project based on countries' ownership and commitment both financial and strategic, i.e., alignment with regional and continental priorities and strategies. The second step is pre-screening projects according to project readiness, alignment of project with strategies including the Ten Year Strategy and High 5s, and availability of policy components for addressing soft interventions such as institutional and sectoral reforms and strengthening, and capacity building. For fragile countries, prioritization is also based on alignment of project with fragility drivers and building resilience. In the final step, projects are scored and ranked based on countries' involvement in regional operations and commitment to regional integration and project relevant indicators. It must be noted that operations outlined in indicative operational program and/or indicative lending programs are generally not explicitly described as climate action plans and classified in terms of mitigation and other sub categories such as energy efficiency or renewable energy. With respect to the energy sector, projects pertain to transmission lines and new power generation; transmission and interconnection re-enforcement projects associated with clean energy sources are considered under mitigation and include Eastern Africa. In the case of Western and Northern Africa, no details were available to justify classification of transmission projects as relevant to mitigation actions. Where possible, on the basis of the title of project, further classification into type of mitigation was done. For example, needs for projects for establishing hydro power plants[21] and developing solar power parks were classified as mitigation needs. Mitigation needs

[21] Large hydropower plants dams are associated with many negative environmental and social impacts

reported in regional integration strategy papers for the 4 regions are shown in **Error! Reference source not found.**.

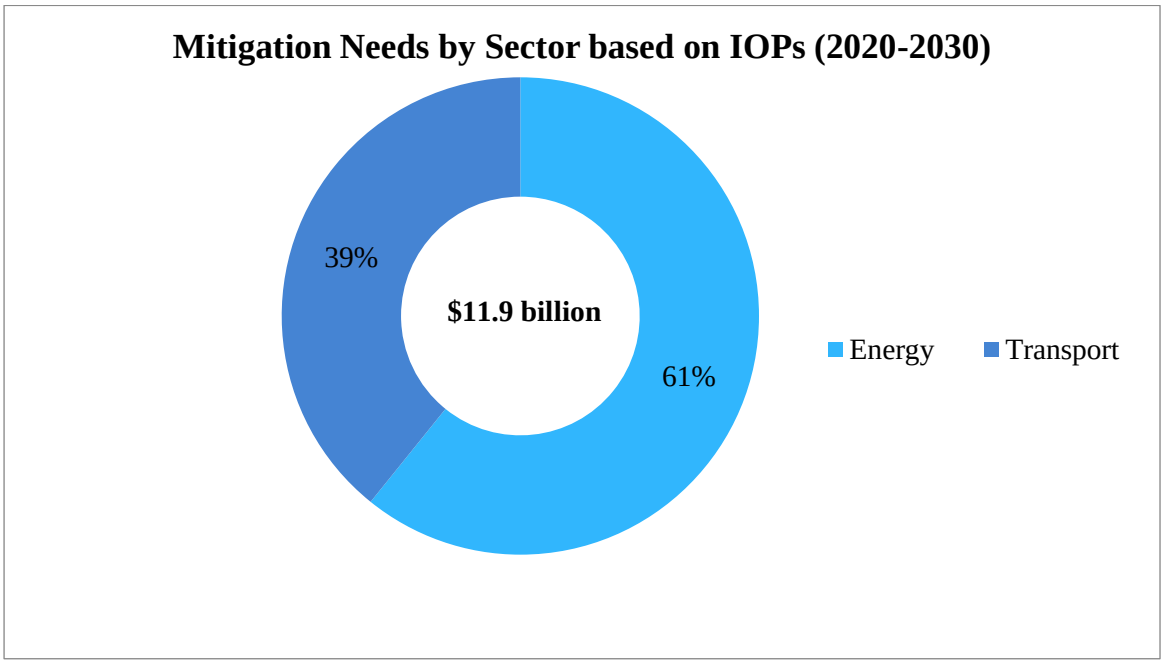

Figure 2-11: Mitigation Needs by Sector based on Indicative Operational Programs extrapolated for 2020-2030

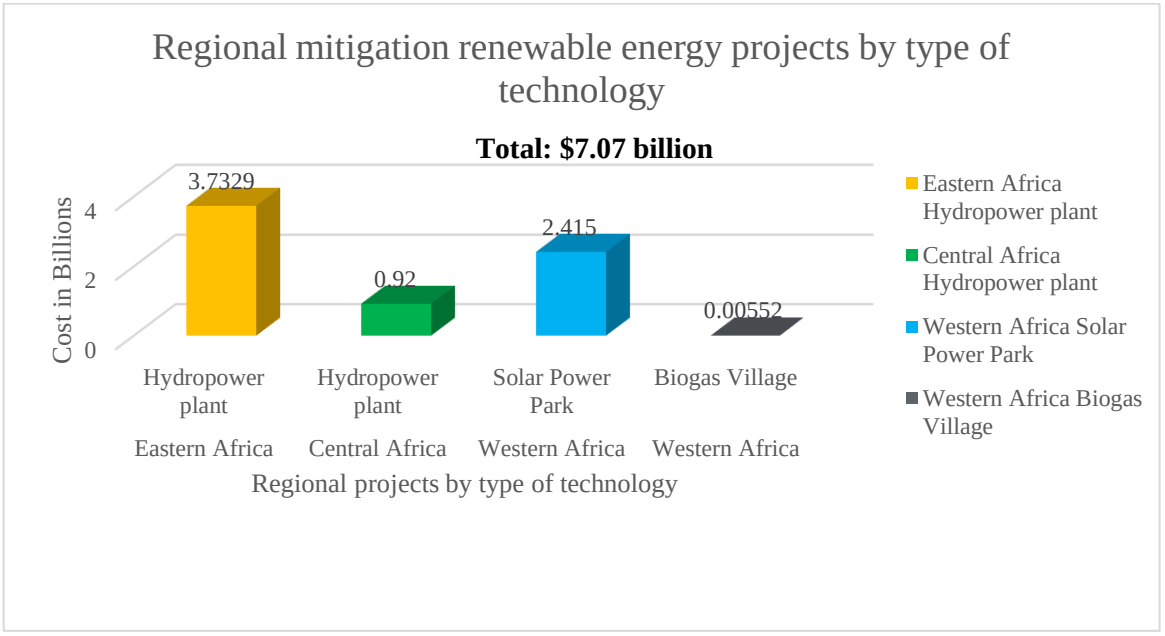

Figure 2-12: Regional renewable Energy Projects in Indicative Operational Programs for 2020-2030)

A breakdown of regional needs reported according to Regional Integration Strategy Papers: Eastern Africa, Central Africa, Western Africa, and Northern Africa and extrapolations are presented in Table 2-7. Needs for 4 regions extrapolated for the time frame 2020-2030 were determined by defining a project cost/year based on the timeframe of the respective region; the project cost/year was used to normalize mismatched timeframes (across the 4 regions

considered) by deducting or extending the years corresponding to the 2020-2030 timeframe.

Table 2-7: Financing resource requirements of Indicative Operational Programs for Mitigation in Regional Integration Strategy Papers extrapolated for 2020-2030

RISP	**Financing Mitigation Needs extrapolated for 2020-2030** 1 UA = $1.38	**Sectoral**
Eastern Africa-RISP: 2018-2022	Total: $7.12 billion	Energy: $3.9 billion includes *$3.73* billion (hydropower) and $0.16 billion (transmission and interconnection lines associated with clean energy sources) Transport: $3.23 billion
Central Africa-RISP: 2019-2025	Total: $1.96 billion	Energy: $0.92 billion (hydropower) Transport: $1.04 billion
Western Africa-RISP: 2020-2030	Total: S2.81 billion	Energy: $2.42 billion solar power parks and biogas village Transport: $0.396 billion
Total mitigation (in RISPs considered)	Total: $11.9 billion	Energy: $7.24 billion (solar power parks, hydropower, biogas village, and transmission lines associated with clean energy sources) Transport: $4.67 billion
Total RISPs (TT, mitigation, adaptation and cross-cutting social)	***$15.33 billion***	Four principal sectors: energy, transport, WSS, and ICT and others such as trade, financial integration, social, (education, gender)

It should be noted that the regional total estimated costs derived from Regional Integration Strategy Papers (RISPs) are likely underestimated due to incomplete determination of costs for 2 energy projects relating to interconnection project in Eastern Africa, incomplete development of Indicative Operational Program for North Africa-Regional Integration Strategy Paper, and unavailability of recent estimates for Southern Africa. To complement data from Northern Africa and complete the review for Southern Africa, country strategy papers were reviewed.

Northern Africa Region

With respect to Northern Africa, the approach to addressing climate change issues in Country Strategy Papers (CSPs) varies across a spectrum; at one end some have strategies explicitly geared towards mainstreaming climate action and achieving green growth and implementing their NDC. At the other extreme are strategies that do not mention climate change or green growth. In between, CSPs include selected projects relevant to developing renewable energy sources, diversifying the energy mix, adopting climate-resilient techniques for agricultural transformation. Some CSPs also report intentions to mainstream climate change related issues or reference climate action in sectoral plans without explicit

targets or concrete interventions. In this context, the documents were reviewed to identify general expressions of support and/or explicitly quantitative support needed.

As a general note, all indicative lending programs reviewed for North Africa are out of date even for countries having current CSPs (namely, Morocco and Tunisia); project status update may inform on current needs.

Morocco's Country Strategy Paper explicitly reports on green industrialization and growth as an objective. Bank annual commitment for the CSP 2017- 2021 is estimated at $483 – 552 million (UA 350 – 400 million) with co-financing needs projected to be $5.5 billion (UA 4 billion.) A breakdown of co-financing needs by project, however, is not provided. According to the CSP, conditional reduction of GHG by 32% is estimated at $45 billion. With respect to sectoral targets, reduction actions include increasing the share of renewable, notably via solar and wind energies, and energy efficiency. The solar program is reported to cost $9 billion and the wind program $3.7 billion for developing a capacity of 4000 MW by 2020.

Tunisia's Country Strategy Paper (CSP) reports on targets that can be classified as mitigation actions in the energy, transport and water supply and sanitation sectors. In the energy sector, mitigation actions include increasing the share of renewable energy from solar and wind sources to 30% by 2030 (up from 3% in 2015.) Another target is a 3% annual reduction in energy intensity (energy consumption TOE/GDP). No cost estimates are reported. In the transport sector, Tunisia's indicative lending program presents two projects. For the project to "Improve Road Connectivity in the North-West", commitments by ADB and co-financing by Africa Growing Together Fund (AGTF) were $96.6 and $41.4 million, respectively (in 2017). For the 'Road Infrastructure Modernization Programme II' project, commitments by ADB and co-financing by AGTF were $69 and 41.4 million, respectively (in 2018). In the water supply and sanitation sector, the classification of water-related targets as mitigation actions is not explicitly stated. However, targets include increasing the yield of drinking water network to 80% by 2020 up from 76% (2017), the share of recycled waste water by 50% (up from nil in 2015), and surface water rate harvesting to 95% (up from 92% in 2015.) In 2018, there was one project relevant to water and sanitation: 'Sanitation Project for 30 Priority Municipalities'; commitments by ADB and co-financing by AGTF were $55.2 and $41.4 million, respectively.

Mauritania's Country Strategy Paper (CSP) reports explicitly on financing needs required for the implementation of its NDC; the target is reducing 33.5 million tCO_2e in the timeframe of 2020-2030, where 88% of the reductions are conditional upon international support. Its commitment is to reduce emissions by 22.3 % by 2030. With respect to sectoral need, in the energy sector, a shortage in supply is anticipated. Installed generation capacity is based on heavy fuel oil and estimated at 350 MW, while electricity demand expected to reach 840-1400 MW by 2025. The CSP reports on opportunities for clean energy sources including from gas sources from recently discovered deposits in the Banda region and renewables such as solar and wind energy sources. The national target for the share of renewable energy is reaching 20% by 2020 up from 15% in 2015. A project to construct

hybrid mini-networks in rural and peri-urban areas financed by African Development Fund (ADF) and estimated at $11 million (UA 8 million) is listed in the indicative lending program covering the period 2016-2020. The unit cost of a hybrid mini network is reported at $600 000; total costs of the projects are not reported neither are co-financing needs.

Egypt's Country Strategy Paper (CSP) reports on Bank's support to the Government on climate change issues including the development of the Green Economy Strategy, the implementation of the NDC, and the development and implementation of the GCF pipeline of projects. Estimates, however, are not reported in the CSP. With respect to sectoral needs, in the energy sector explicit co-financing needs in the indicative program amount to $200 million (UA145 million) for the 'Roll-out of Smart Grid Technologies' pilot project are reported. Bank commitments amount to $199 million (UA143.9 million.) There may also be needs to support large scale solar PV Independent Power Producer projects. Status update can inform on current needs. In the water sector, assessing the feasibility of pumping irrigation water is one topic reported as subject to grant availability. Status update can inform on current needs. In the transport sector, the October 6th Dry Port (reserve) is listed in the pipeline of the indicative lending program, where Bank commitments from ADB and co-financing by EBRD amount to $41 million) UA 30 million each.

Algeria's Country Strategy Paper (CSP) is focused on support for transformation of the energy sector as one of the two pillars. The target power capacity from renewable sources is 22 GW by 2030. By 2030, renewable sources would contribute to 37% of installed capacity and 27% of power generation for domestic use. Co-financing needs are qualitatively reported for the public investment program relevant to new operations for power supply, i.e., SONELGAZ investment project in 2018; estimates are not reported. Considering various government efforts and initiatives for green growth, e.g., 2016-2019 New Economic Growth Business Model, Algeria Vision 2035, and the National Energy Efficiency Programme (2016-2030), status updates may inform on current needs.

Libya's re-engagement strategy does not consider climate change. However, the strategy reports on critical basic infrastructural developments required in the energy and water sectors. Infrastructure in the energy and water sectors is reported as poor or damaged. In the energy sector, poor infrastructure is responsible for energy shortage. Potential mitigation action opportunities include energy conservation and diversification of energy sources to bridge the energy shortage. Government investment plans are mentioned for the sector; no details are provided. Status update may inform on needs. In the case of water, essential infrastructure consists of rehabilitation of water pipes damaged during the war.

Southern Africa Region

Lesotho's Country Strategy Paper (2020-2024) reports on the government's commitment to reduce GHG by 10% by 2030 and 25% conditional of external support (NDC referenced within the CSP). Needs for mitigation are not explicitly reported in the CSP. However, projects pertinent to mitigation include the Renewable Energy Integration Study. With respect to the use of renewable energy sources, the CSP references the National Policy

2020-2025, where renewable energy is considered to help bridge the gap in energy demand. The National Adaptation Program of Action on Climate Change (NAPACC) and Environmental Act 2008 prioritize off-grid alternative sources of energy, for hydropower, where a target of 50% of the energy mix is reported. One of the challenges to renewable energy reported in the CSP is a lack of awareness of renewable energy technologies. The government's interest in potential waste to energy is also stated.

Eswatini's Country Strategy Paper (2020-2024) reports a target of increasing domestic renewable energy generation from 102 MW to 145 MW by 2024 is reported. One project related to renewable energy is listed in the Indicative Lending Program, the costs of which are covered by Bank commitments of $69 million (UA 50 million). No explicit GHG emission targets are reported.

Namibia's Country Strategy Paper (2020-2024) reports on opportunities for renewable energy, especially, hydro and natural gas. The Government's energy sector goal is to generate 755 MW by 2023 from sustainable sources and increase national electricity access rate from 49% in 2018 to 67.5% by 2023. A target of 224 MW from renewable energy sources, Namibia Power Corporation, Nampower project, by 2024 is reported. It is worth noting that reporting renewable energy share in the total final energy consumption (%) has decreased from 34.2% (2000) to 32.8% (2010) to 26.5% (2018). Reasons are not provided, but potential financing constraint should be explored.

The Country Strategy Paper of Malawi describes principal GHG emitting sectors, which consist of energy, agriculture, forestry and other land use, and waste. Potential emissions savings if a low emissions development path is adopted are estimated to be in the range of 14,000 and 16,000 Gg of CO_2 per year by 2030 conditional of financial assistance. Estimates for financial assistance are not provided. In the water sector, needs for co-financing were derived for one identified project relevant to water supply and sanitation, the Nkhata Bay Town Water Supply and Sanitation with a total cost of $29 million (UA 21.2 million.) Considering Bank commitments and government co-financing estimates of $14 million (UA 10.5 million) and $3 million (UA 2.4 million), respectively, co-financing needs amount to $11 million (UA 8.3 million.) If Government financing is assumed not secured, co-financing needs amount to $15 million (UA 10.7 million.) In the energy sector, demand in energy is estimated at 400MW while the current electricity generation capacity is 351 MW with 90% being supplied by biomass. The Country Strategy Paper reports investments are needed in order to enhance generation, transmission, distribution, and use of alternative and renewable energy sources. An estimate of needs is not provided. In the agriculture sector, a potential reduction of 400 Gg CO_2e/year by implementing climate smart agriculture by 2040 conditional upon support is reported. Unconditional reductions are estimated at 100 GgCO_2e by 2040. In the forestry and other land-use sector, a target for afforestation by a 2% increase in forest cover nationally is reported. The conditional reduction of CO_2 due to increased forest coverage is reported as 2.6 million tCO_2e. In the waste sector, external support for the implementation of actions is reported qualitatively for waste sector, where generation of waste and the need for waste management systems are projected to increase due to a high rate of urbanization (5.2%).

South Africa's Country Strategy Paper (2018-2022) references the Integrated Energy Resource Plan 2010-30, which sets a target to reduce the share of coal in the energy mix from 81% (as of 2017) to 48% by 2030. The share of energy from renewables, mostly wind and solar, is expected to increase to 13,225 MW by 2025 and constitute 42% of energy mix by 2030. The need for investment to increase capacity by 20 000 MW by 2025 is mentioned; no associated estimates are provided.

Mozambique's Country Strategy Paper references the Climate Investment Fund 2012, where the total cost for climate change mitigation actions is estimated at $450 million/year. Bank investments will focus on climate-proofing of design and planning of infrastructure and supporting diversification of energy sources and limiting deforestation. Furthermore, the CSP references Mozambique's 2013-25 National Climate Change Adaptation and Mitigation Strategy, where actions are relevant to forestry and agriculture sectors. New operations in the energy sector that may require external support include the Temane 400 MW gas to power plant project, the Quantum Power - Namaacha 120MW wind project; costs and financing information are not reported.

Angola's Country Strategy Paper reports on the lack of Nationally Appropriate Mitigation Action Plan and on the country's early stage in developing a green growth agenda. In the context of renewable energy, the National Strategy for Renewable Energy defines a target of 800 MW by 2025 from renewable energy sources. Opportunities for renewable energy sources include hydropower for which the estimated generation potential is 18,267 MW. Co-financing needs of $13.8 million were determined for Renewable Energy Mini-grid project under the indicative lending program. In the transport sector, two projects relate to infrastructural corridor developments and for which $53 million (UA 38.2 million) are planned to be secured by the Government of Angola. A third operation is a rail link, where $69 million (UA 50 million) are planned to be co-financed by the Africa Growing Together Fund. The country strategy paper also lists pipeline interventions, which are not yet at the readiness level to be part of the lending program. The total co-financing needs for a highway and port development is $139 (UA 101 million) broken into $97 million (UA 70 million) for the Luanda-Lobito Highway and $43 million (UA 31 million) for the Porto Amboim Development Project.)

Madagascar's Country Strategy Paper explicitly reports on climate financing sources in its indicative lending program. In the energy sector, co-financing from climate funds (CIF, Energy Fund) and the EU for Project to Strengthen Power Transmission Networks in Antananarivo (transmission and distribution) amounted to $47 million. Private sector co-financing amounted to $1232 million (UA 893 million) for two hydropower projects the 192 MW Sahofika Hydropower Project $708 million (UA 513 million) and the 90 MW Volobe Hydropower Projects $524 million (UA 380 million.) The country strategy paper reports on renewable energy potential. Potential Hydroelectricity resources amount to 7,800 MW; only 159 MW were utilized (2018). The solar and wind energy potentials are approximated at 2,000 kWh/m²/year and 2000 MW, respectively. Under the New Energy Policy developed for 2015-2030 timeframe, the target energy mix is 85% of renewable energy and 15% thermal to achieve an electricity access rate of 70%. Investment needs to

cover the power value chain up to 2030 were qualitatively reported. The Country Strategy paper also reports on the potential for green growth, particularly with respect to extraction of non-renewable resources such as nickel and cobalt. In the transport sector, Bank commitment and co-financing from climate funds for National Road 9 Upgrading Project (Phase 2) amounted to $52 million (UA37.5 million) and $60 million (UA 43.8 million), respectively.

Zambia's Country Strategy Paper (2017-2021) reports on the southern region's electricity deficits and on opportunities for renewable energy from hydropower estimated at 4,000 MW. The CSP reports investment will be needed. However, quantitative estimates are not provided. It should be noted, however, that climate is one of the four screening criteria reported in the country strategy paper for project preparation. Zambia adopted a National Policy on Climate Change in 2016. Furthermore, climate related issues are being mainstreamed in national development policies.

Botswana's CSP reports on the need for external support to supplement pubic resources for energy efficiency and generation projects; PPPs are mentioned as potential sources of support. Electricity demand estimated at 580 MW surpasses available capacity of 322 MW. The country relies on coal for energy generation. One project in the indicative lending program is the Extension of Morupule B Energy Project (for consideration in 2015); no costs or support are provided. However, potential co-financiers are listed (namely, JICA and WB). Green growth by adoption of cleaner technology for infrastructural developments and promotion of renewable energy is reported as an objective. However, no estimates for mitigation actions are reported. In the water sector, the CSP reports on sustainable and efficient access to safe water, where investments pertain to water supply and sanitation infrastructure and services. One project in the indicative lending program is the North South Carrier II Water Project (for consideration in 2016); no costs or support are provided. However, potential co-financiers are listed (namely, WB).

Mauritius's Country Strategy Paper (2014-2018) references a green growth framework, the Maurice Ile Durable (2008 initiative and 2013 action plan). The framework provides targets for renewable energy to reach 35% of the energy mix with a reduction in the share of fossil fuel sources to 65% by 2025. The CSP reports on the use of bagasse as a biofuel, which constituted 17% of national electricity production (2015); a potential increase to 25% was reported conditional of 'necessary investments' corresponding to a reduction of 375,000 tons of coal imported and preventing annual emission of 1.2 Million tons CO_2. The CSP provides an overview of a $10 billion infrastructure program, where updates on the program may inform on current needs. Under the Proposed and ongoing (2014-2018) operations, one proposed infrastructure program relevant to green and inclusive energy, water and cost effective mass transport systems was estimated at $138 million. Status updates may inform on current needs. Green growth related analytical works and regulatory actions relevant to mitigation reported in the outdated CSP, in the present time, may have translated into operations requiring investments and external support needs. Status update may inform on current needs. In the water sector, the CSP reports on water shortages, inefficiencies due to

aging infrastructure (old pipes). The CSP references a cancelled project in the water sector having an estimated cost of $86.29 million in 2013 (financing by AFD).

Zimbabwe's Country Strategy Paper (2014-2016) reports on potential co-financiers for the Multinational Kariba Dam Rehabilitation Project in the power sector. The total cost was $262 million (UA 190.15 million), where Bank commitments amounted to $67 million (UA 48.5 million) and potential co-financing to 196 million (UA 141.7 million.) Potential co-financiers consisted WB, European Development Fund, Sweden, Zambezi Water Authority contributing $67 million (UA 48.47 million), $89 million (UA 64.63 million), $22 million (UA 16.16 million), and $3 million (UA 2.42 million), respectively. Financing for infrastructure projects in energy and water sectors was provided by multi-donor countries consisting of Australia, Denmark, Germany, Norway, Sweden, Switzerland, and the United Kingdom administered by the Bank, the Zim-fund. Total commitments amounted to $145 million for the 'Urgent Water Supply and Sanitation Rehabilitation Project' and Emergency Power Infrastructure Rehabilitation Project - Phase 1 (EPIRP). A funding gap amounting to $14.85 million and additional commitments for phase 2 amounting to $34.85 million were reported. A breakdown of needs per project was not provided. Status update may inform on current needs.

On a continental level, infrastructural investment needs reported in the African Economic Outlook (2018) are also not classified in terms of climate action such as mitigation. In the case of the energy sector, infrastructural investment needs are determined on the basis of universal access to electricity achieved via new power generation and transmission lines to increase the power trade. Assuming that clean technologies (low carbon emissions) for infrastructure developments are planned, infrastructural investments in the energy sector were classified as mitigation actions. Investment needs in the energy sector for power generation and transmission lines were extrapolated for the time frame of 2020-2030 and are estimated to be in the range of $350-500 billion. The estimate is determined assuming no funds are mobilized and investment needs in the energy sector are in the range of $35-50 billion/year out of a total infrastructural investment requirements estimated at $130-170 billion/year (Africa Economic Outlook 2018). It is noteworthy that in 2016 infrastructural investment needs were reported to be in the range of $68 and $108 billion/year across 4 main sectors: energy, transport, Information and Communication Technology, Water Supply and Sanitation based on the mobilization of $63 billion from all sources. The mobilization of $63 billion was already in decline compared to previous years due to reductions in private sector engagement and Chinese funding. Recent economic downturns make assumptions of mobilization difficult to determine. For this reason, estimates are made assuming no financing is secured.

Continental needs in the energy sector needed to achieve universal electricity access goal by 2030 amount to $420-670 billion for the 2020-2030 timeframe assuming estimates depend mainly on the type of technology. The estimation was determined based on the difference between total requirement of $65-90 billion/year and 23 billion/year mobilized resulting in needs in the range of $42-67 billion/year for the timeframe of 2016-2025 as

reported in Light Up and Power Africa, the continental strategy for energy. The extrapolation consisted of multiplying the annual needs of $42-67 billion/year for the time frame of 2020-2030.

In the case of transport, infrastructural development pertains to developing and/or upgrading roads and network, which are considered in this report as mitigation needs since maintained roads etc. can reduce travel time and in turn emissions. An exception where infrastructural needs should be considered as adaptation is in coastal areas. However, this distinction is not reported in the aforementioned continental estimates considered. Needs in the transport/road sector assumed as mitigation amount to $350-470 billion for 2020-2030. Table 2-8 shows sectoral needs for the period 2020-2030 considered as mitigation.

Table 2-8: Sectoral mitigation needs in Africa for the period 2020-2030

Thematic Area	Sector	Continental Need for 2020-2030 ($ billion)
Mitigation	Energy	420-670 (Light up and Power Africa)
Mitigation	Energy power generation and transmission lines	350-500 (Africa Economic Outlook 2018)
Mitigation	Transport	350-470 (Africa Economic Outlook 2018)

Table 2-9 below summarizes the total sectoral mitigation costs derived from different AfDB sources, followed by illustrations in Figure 2-13 and Figure 2-14.

Table 2-9: Total Sectoral Mitigation Needs reported from different sources for the period of 2020-2030

Total Sectoral needs between 2020-2030[22]	IRENA Database ($billion)	Africa Economic Outlook 2018 ($billion)	LightUp and Power Africa ($billion)	RISPs ($billion)
Energy	454	350 - 500	420 – 670	8.23
Transport	NA	350 - 470	NA	4.67

[22] Regional estimated costs derived from Regional Integration Strategy Paper s are likely underestimated due reasons incomplete determination of costs of 2 projects relating to energy, incomplete development of Indicative Operational Programs for North Africa-Regional Integration Strategy Paper, unavailability of recent estimates for Southern Africa

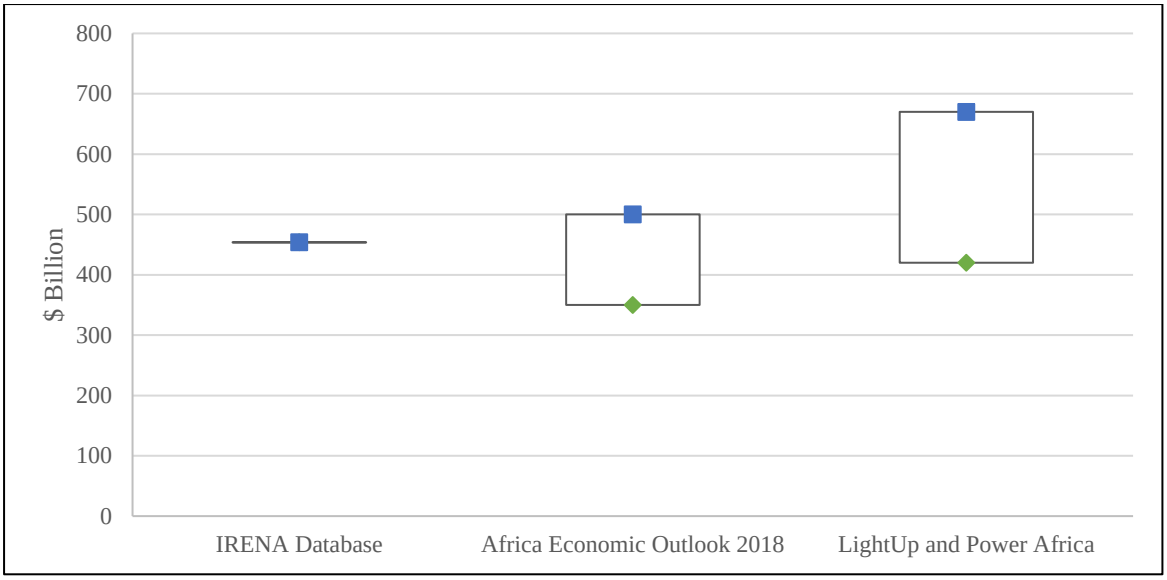

Figure 2-13: Total mitigation needs for energy sector reported from different sources

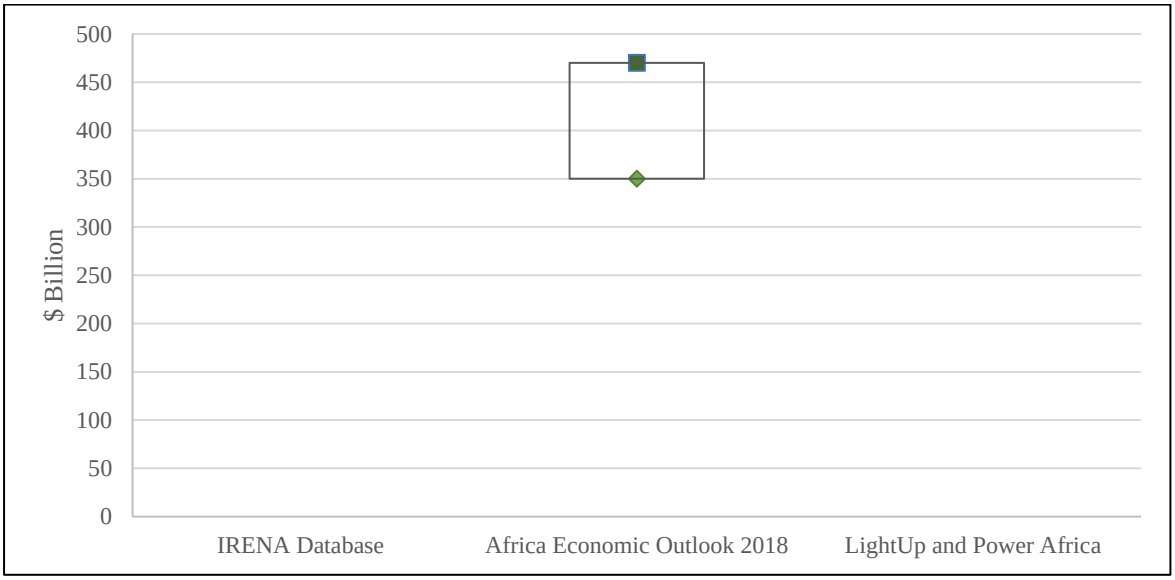

Figure 2-14: Total mitigation needs for transport sector reported from different sources

2.2.4 Loss and Damage Needs

Loss and Damage (L&D) refer to the residual impacts of climate change that occur despite mitigation and adaptation measures. Costs included in L&D are related to permanent and irreversible losses, reparation or restoration of damages, residual damages, anticipatory adaptation investments, and reactive costs. Examples of L&D include damage to infrastructure, disruption of livelihoods, reduced agricultural production, decreased provision of goods and services (e.g. tourism), loss of terrestrial territory, and decreased biodiversity or ecosystem services. L&D costs are typically derived from the analysis of climate change adaptation and disasters risk reduction. Adaptation analysis assesses loss and damage costs prior to a possible disaster to offer anticipatory measures, whereas disaster risk reduction includes a wider range of assessments that address the disaster risk

management cycle including response, recovery, mitigation and preparedness. Quantitative and qualitative analysis of both determine the total L&D costs needed.

According to the AfDB published report on the climate change impacts on Africa's Economic Growth (2018), the projected loss and damage costs for the 5 African regions (Norther, Southern, Eastern Western, and Central) between 2020 and 2030 amount to $ 440.5 billion in the high warming scenario (more than 4 degrees increase in global average temperature), and $289.2 billion in the low warming scenario (less than 2 degrees increase in global average temperature) as shown in Table 2-10 and Figure 2-15. Loss and Damage costs were reported in the Climate Change (CC) Impacts on Africa's Economic Growth report for each Region as % of GDP in the year 2050 for high global warming scenario (average temperature exceeds 4 degrees), and low (global average temperature is maintained below 2 degrees). GDP and growth rate projections were referenced from the AfDB's 2020 Economic Outlook. The costs for the period 2020-2030 were then estimated assuming equal annual costs between 2020 and 2030. It should be noted that the determined needs are based on the available data reported in AfDB documents, and should not be considered conclusive or exhaustive of actual needs.

Table 2-10: Regional Loss and damage costs by 2030 in Africa (source: African Development Bank)

Region	GDP In 2020 ($bn)	L&D costs (% of GDP) Assuming constant % between 2020-2050	L&D costs in 2020 ($bn)	Projected GDP growth rate in 2030[23] (%)	GDP in 2030 ($bn)	L&D costs in 2030 ($bn)	Annual costs (assuming equal costs between 2020-2030)	L&D costs between 2020-2030 ($ bn) Assuming linear increase between
High warming scenario (more than 4 degrees increase in global average temperature)								
Eastern Africa	417	3	12.5	9.3	455.8	13.7	13.1	**131**
Western Africa	500	2.5	12.5	5.5	527.5	13.2	12.85	**128.5**
Central Africa	271.4	1.75	4.7	6.8	290	5.1	4.9	**49**
Southern Africa	571	0.8	4.6	5.3	601.3	4.8	4.7	**47**
Northern Africa	1386	0.6	8.3	4.8	1452.5	8.7	8.5	**85**
Total			42.6			45.5		**440.5**

[23] Africa in 50 years time: The road towards inclusive growth. African Development Bank. 2011. Available at https://www.afdb.org/fileadmin/uploads/afdb/Documents/Publications/Africa%20in%2050%20Years%20Time.pdf . (accessed: 6 December, 2020)

Region	GDP In 2020 ($bn)	L&D costs (% of GDP) Assuming constant % between 2020-2050	L&D costs in 2020 ($bn)	Projected GDP growth rate in 2030[23] (%)	GDP in 2030 ($bn)	L&D costs in 2030 ($bn)	Annual costs (assuming equal costs between 2020-2030)	L&D costs between 2020-2030 ($ bn) Assuming linear increase between
Low warming scenario (less than 2 degrees increase in global average temperature)								
Eastern Africa	417	1.8	7.5	9.3	455.8	8.2	7.85	**78.5**
Western Africa	500	1.6	8	5.5	527.5	8.44	8.22	**82.2**
Central Africa	271.4	1.25	3.4	6.8	290	3.62	3.51	**35.1**
Southern Africa	571	0.5	2.85	5.3	601.3	3	2.92	**29.2**
Northern Africa	1386	0.45	6.3	4.8	1452.5	6.54	6.42	**64.2**
TOTAL			28.05			29.8		**289.2**

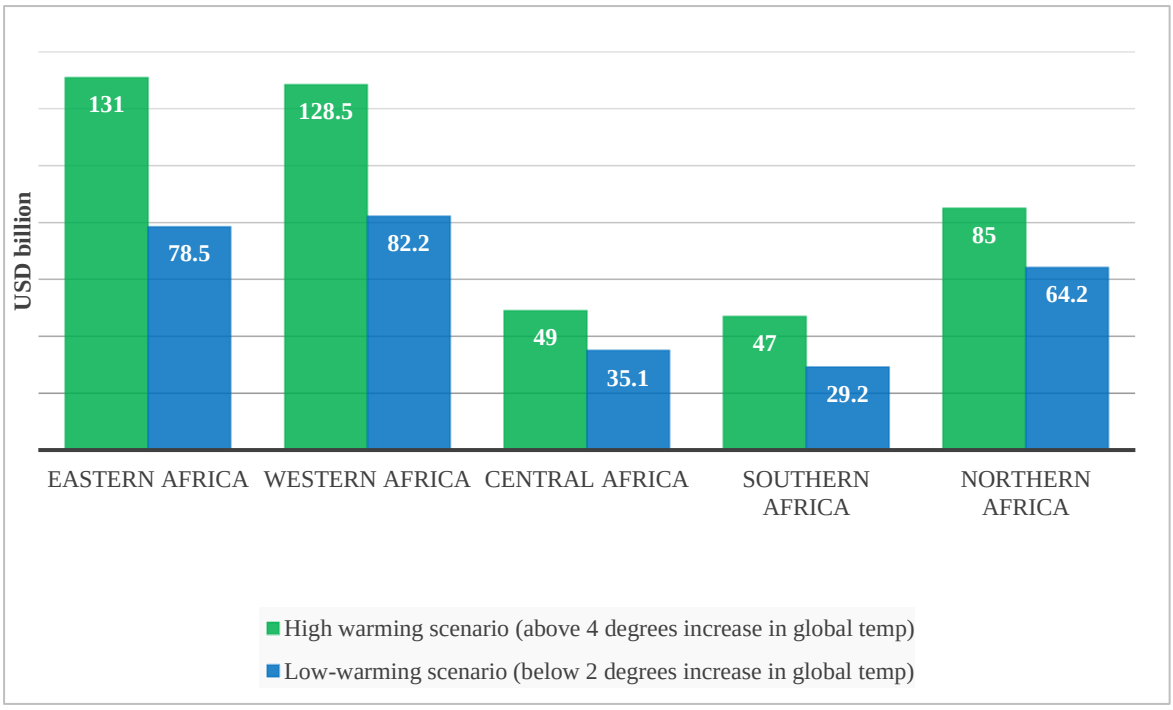

Figure 2-15: Regional CC Loss and damage costs by 2030 in Africa (source: African Development Bank)

2.2.5 Climate Finance Enabling Environment Needs

Financing gaps for projects related to climate are estimated and reported in the previous sections. One of the main needs reported for bridging the financing gaps is increasing and diversifying financing sources, namely via private sector engagement and international co-financing sources in addition to the Bank's. For example, with respect to needs pertaining to mitigation and adaptation in NDCs, the Africa NDC Hub's operational focus areas include private sector engagement, while its Gap Analysis report 2018 highlights the importance of private finance participation to achieve Climate financing needs in Africa. The report identifies priority sectors for increasing private investment mobilization. Priority sectors include renewable energy (particularly solar), agribusiness, green building, urban transport, water, and urban waste management. The report estimated that $1 trillion can be available globally as private investments in these sectors. The need to engage private sector, i.e., provide attractive financing environment, is further emphasized in the African Financial Alliance on Climate Change (AFAC) brochure 2018, where 75% of an estimated $3 trillion investment requirement based on African NDCs for climate change in Africa by 2030, is expected to come from the private sector (no methodology for determining this number is provided).

The need to mobilize resources from the private sector is reported qualitatively in regional strategies in the context of financing gaps estimated. With the Bank's project pipeline currently exceeding the funding envelope/pool available by the Bank (Climate Change and Green Growth 2018 Annual Report), the underlying assumption is that increasing private sector engagement would help bridge the financing gap. Regional projects consisting of technical studies to promote private sector are addressed in North Africa's Indicative Operational Programs. The example of North Africa can help provide an estimate for similar studies on improving financing environment for private sector in other regions.

Furthermore, the need to increase co-financing in addition to AfDB financing is reported. Approaches to increase co-financing include enhancing collaborations and engagements with Development Partners such as the -European Union, World Bank, International Monetary Fund as reported in Eastern Africa and Central Africa Regional Integration Strategy Papers. The need to increase co-financing by introducing risk-sharing instruments to finance infrastructure projects is reported in the Eastern Africa Regional Integration Strategy Papers. The need to introduce blending instruments and mobilizing climate and green finance are reported in the Western Regional Integration Strategy Papers. Other examples include, for example, the Central Africa- Regional Integration Strategy Paper, where needs for co-financiers and partnerships to support the preparation and implementation of infrastructure projects under the Central Africa Consensual Transport Master Plan and the Programme for Infrastructure Development in Africa are reported; the Eastern Africa- Regional Integration Strategy Paper reports on limited access to concessional funds for non-ADF countries resulting in co-finance needs. Another approach to increase mobilization of resources reflects the need for increasing the bankability of

projects. For example, the preparation of bankable energy project and preparation of infrastructural projects is reported in Central Africa- Regional Integration Strategy Paper.

The need to increase private sector and international financing is reflected by the Bank's approach for mobilizing more funds towards climate action, which includes improving the engagement of the private sector, mainstreaming climate change into all its operations to improve access to global/regional climate funding with a target to have 100% of its operations climate-proofed by 2020, scaling up its climate finance portfolio to reach 40% of the Bank's total project approvals by 2020, and improving bankability of projects (project feasibility and preparation support). These needs must be coupled with reduction in internal and external debt levels of African countries in order to create the necessary enabling financing environment to increase financial flows to Africa, including foreign direct investment (FDI), and international development financing. Debt reduction measures may require additional costs and relief strategies that should be estimated and considered in the total needs. Section 4.1.4 highlights the African debt level.

A summary of needs to improve climate financing environment needs is illustrated in Figure 2-16.

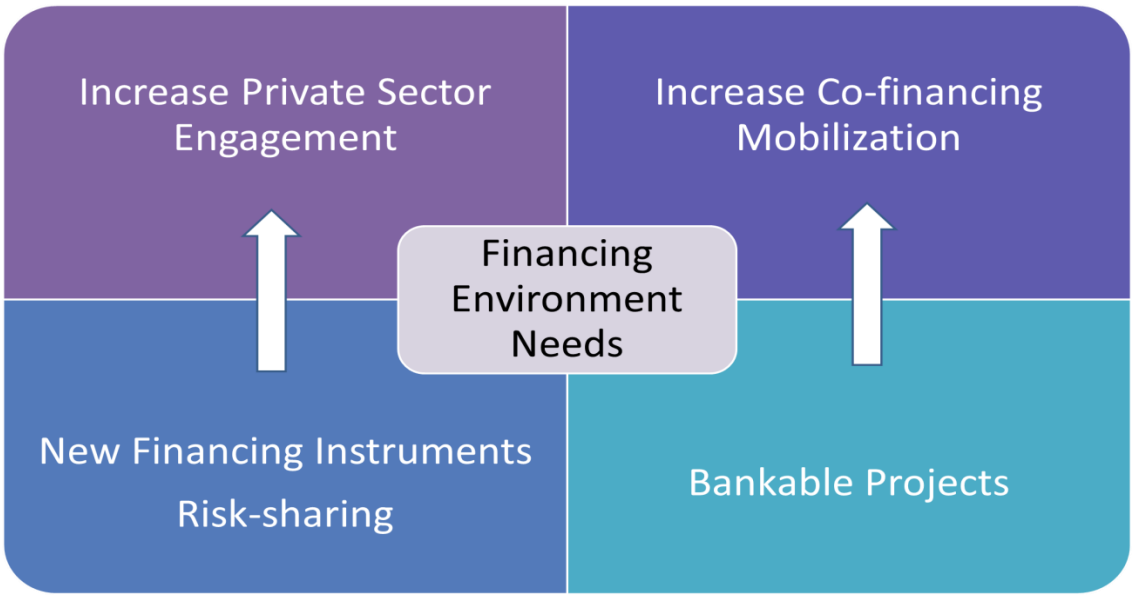

Figure 2-16: Summary of financing environment needs

2.2.6 Capacity Building Needs

Capacity building needs include institutional capacity strengthening and support. While some reports such as Central Africa's Indicative Operational Programs classify projects as capacity building specifically, others do not use the classification consistently. In the latter cases, projects were classified as capacity building if the title allowed inference of institutional capacities strengthening. Any project or program consisting of technical studies was considered under technical and technological needs. Using this definition, capacity building requirements were reported for Eastern, Central and Western Africa in

their respective indicative operational programs in regional strategy papers, however, commitment by the AfDB and other co-financiers covered the costs of associated projects.

Capacity building needs were not reported in the reviewed documents. In regional integration strategies, costs for capacity building projects were covered by Bank and other co-financing sources. However, needs derived from costs projects in indicative operational programs are likely underestimated as the projects undergo a screening process. Therefore, reported costs of projects are likely not reflective of actual CB needs.

Southern Africa Region

Malawi's country strategy paper reports on capacity building needs for adaptation actions in the water sector integrated water resources management with reference to the National Climate Change Management Policy (2016); no estimates are provided.

Mozambique reports on the need for institutional capacity building for data collection, early warning systems, and access to climate finance; estimates are not provided.

Angola's country strategy paper reports on potential co-financing needs in the energy sector to supplement Bank efforts for capacity building programs aimed at promoting of renewable energy and green growth.

Botswana's country strategy paper reports on capacity building to promote bankable projects for PPPs for infrastructural investments aimed at increasing productivity, while considering inclusive growth and transition to green growth.

Zimbabwe's country strategy paper (2014-2016) reported on capacity building needs in the water sector for rehabilitation of water and sewer infrastructure, and in the energy sector under the Emergency Power Infrastructure Rehabilitation Project (EPIRP project) for the rehabilitation of the Hwange power station.

2.2.7 Monitoring, Reporting, and Verification (MRV) needs

In order to fulfill the MRV requirements provisioned by the PA, developing countries need support in producing reports, technical, financial, and institutional capacity building for the implementation and operation of domestic MRV activities, as well as the infrastructure needed to ensure effective implementation of said activities (e.g. setting up data collection databases and systems, and institutional structure).

2.2.7.1 Reporting needs

	BTR and NC	**NAP**
Cost per report	$ 0.5 million[24]	$3 million[25]

[24] Information note on the financing of Biennial Transparency Reports (BTR) for developing country parties to the Paris Agreement. 2020. Global Environment Facility (GEF). Available at https://www.thegef.org/council-meeting-documents/information-note-financing-biennial-transparency-reports-developing (accessed: 7 December, 2020)

[25] Green Climate Fund (GCF).

Number of reports needed between 2020-2030	4	1
Number of countries needing support for producing report[26]	54	50
Total needs for fulfilling PA reporting requirement	$108 million	$150 million
TOTAL	**$258 million**	

2.2.7.2 Capacity building needs for MRV

The enhanced Transparency Framework was a key result of the Paris Agreement, aimed for tracking and reporting the progress of existing and future country commitments, with built-in flexibility included for developing countries. As a result, the Capacity Building Initiative for Transparency (CBIT) was created under the Global Environment Facility (GEF) to help strengthen the institutional and technical capacities of developing countries to meet the enhanced transparency requirements defined in Article 13 of the Paris Agreement. Out of its total global portfolio of 71 projects during the current GEF-7 period 2018-2022, CBIT priority areas are illustrated by category in Figure 2-17. It is possible that one project may have several of these individual categories, therefore the percentages in the figure overlap and do not add up to 100 percent[27].

[26] National Adaptation Plans from Developing Countries. UNFCCC. Available at https://www4.unfccc.int/sites/NAPC/News/Pages/national_adaptation_plans.aspx (accessed 7 December, 2020)

[27] Progress Report on the Capacity-building Initiative for Transparency. 2020. Capacity Building Initiative for Transparency (CBIT). Available at https://www.thegef.org/council-meeting-documents/progress-report-capacity-building-initiative-transparency-6 (accessed: 7 December, 2020)

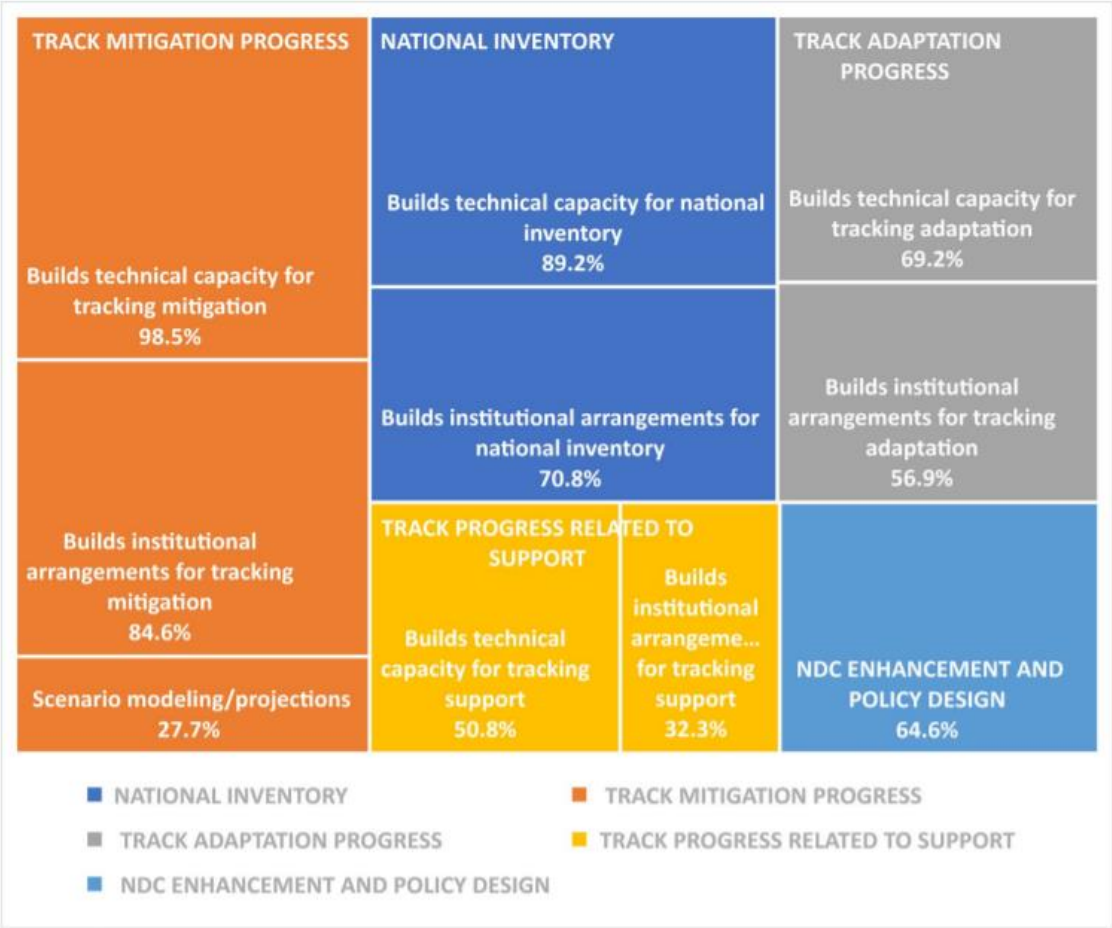

Figure 2-17 CBIT priority areas (source: GEF)

As of October 2020, CBIT provided support for 23 African countries (24 projects including regional project covering COMESA[28] members in Eastern and Southern Africa), at an average cost between $1.5 to 3 million per project, and a total funding of $36.7 million. Therefore, the remaining African countries (31 countries) are entitled for CBIT support, which is identified as MRV capacity building needs, amounting to $46.5 to 93 million, assuming a minimum of one project per country in order to improve the capacity required for transparency enhancement of MRV activities.

2.2.7.3 MRV system infrastructure needs

A Monitoring Reporting and Verification (MRV) system is essential for tracking a country's progress towards the mitigation objectives set under its Nationally Determined Contributions (NDCs). For its effective implementation, rigorous institutional structure is required to ensure clear mandates between involved institutions, clear timelines and

[28] Common Market for Eastern and Southern Africa: 19 countries including: Burundi, Comoros, Congo, Dem Rep., Djibouti, Egypt, Eritrea, Ethiopia, Kenya, Libya, Madagascar, Malawi, Mauritius, Rwanda, Seychelles, Sudan, Swaziland, Uganda, Zambia, and Zimbabwe

reporting outlines, as well as policy framework for the MRV system. In addition, the establishment of local teams, databases, and web portals responsible for providing quality data and information for homogenous MRV systems that provide a common and accurate approach for reporting progress made in the country, and the gaps requiring further support (i.e., improving quality of National Communications and Biennial Transparency Reports/Biennial Update Reports). There is a strong need for international support to establish the needed infrastructure for effective transparent reporting, which requires additional support besides the technical and institutional capacity building or report preparation needs. Based on an MRV system design and development project implemented in one of the African countries, infrastructure costs for implementation of the MRV system in the electricity sector only were estimated at $750 thousands, reported as an additional need on top of a total of $345 thousands for all other components of the system. This shows that for only one sub-sector in one country, approximately 1 Million $ is needed for infrastructure support.

2.2.8 Past Projects and Operations

The financial models, unit cost, or estimated investments in past projects and operations can form a basis for the estimation of analogous costs and needs for mitigation and adaptation projects in other regions or countries with similar conditions. Additionally, some lessons learned can be extracted from the experiences gained in the preparation and implementation of those projects to enhance the financing environment and alleviate financial risks in the African countries. It also provides an overview of the focus areas or scope of some funds and/or multilateral organizations that can be useful in determining the eligible sectors or projects for climate finance.

Annex 4 wraps up the highlights of some relevant projects documents and reports. Nevertheless, the GCF proposals have been included in this section since they provide thorough information and insights into relevant mitigation/adaptation projects in key sectors (e.g. energy and agriculture) in different African countries.

In the agriculture sector, GCF approved a “Program on Affirmative Finance Action for Women in Africa (AFAWA): Financing Climate Resilient Agricultural Practices in Ghana”. The purpose of the project is to support agribusiness owned by women by providing a line of credit and technical assistance activities. The project supports the Ghana Incentive Based Risk Sharing System for Agricultural Lending (GIRSAL). The GIRSAL can serve as an approach for implementation elsewhere to improve financing environment for growing high investment risk sectors such as agriculture. The reported costs of the program for support of the risk sharing financing mechanism, GIRSAL, $25.6 million, where the line of credit costs is $23.5 million, and the lifetime is 5 years.

Another programme, named “Integrated Development and Adaptation to Climate Change in the Niger Basin (PIDACC/NB), aims at enhancing the resilience of natural and human systems in the Niger Basin against climate change, climate variability and associated risks. The programme will strengthen the resilience of health and well-being, food and water

security, ecosystem and ecosystem services. Furthermore, it will result in less emissions from forestry and other land use (around 1.4 million tCO_2eq annually, 7 million tCO_2eq during the project lifetime) due to the sustainable forest and soil management by developing 40,000 ha of forests and building capacity of 200 members of community associations in REDD+. The estimated cost for reduction of 1 tCO_2eq in this project is $4.4.

Since energy access has been a nuisance in several African countries, there are two programmes for green mini-grid systems in Democratic Republic of Congo (DRC) and Yeleen in Burkina Faso in addition to another energy related project in Zambia for a renewable energy financing framework. The goal of DRC's programme is to deliver clean energy to three towns, which are currently off the grid, through financing three solar hybrid mini-grid model. The programme target is to install 18.5 MW solar PV with battery. The project will mainly result in Mitigation of GHG emissions. It will also have some Adaptation co-benefits since energy access will enhance the social and economic resilience of low income communities in highly vulnerable areas to climate change. Moreover, the project has a component that is concerned with capacity building and technical assistance. The total cost of the 3 projects equals $87 million. The energy sector (mini-grid solutions) estimated cost per tCO_2eq in this project is $155/$tCO_2eq$. Those units can be used to estimate costs for similar projects.

Whilst, Yeleen rural electrificatin project aims at delivering clean energy with a target capacity of installed PV systems equals to 11.4 MWp. The project will culminate in mitigation of GHG emissions (Expected lifetime emission reductions = 390,000 tCO_2eq) with some adaptation co-benefits. The project will help in increasing the resilience of the agriculture sector and rural population by developing a sustainable model for rural electrification that will enable them to access irrigation, provide sustainable livelihoods, and eradicate poverty. It will also help Burkina Faso as a landlocked country to adapt to climate change impacts and recover from political and social instability. The project also incorporates technical assistance activities to strengthen the sector institutions with about 30% women (Gender) trained. Total project financing is equivalent to EUR 53.1 million. The total capital cost of the mini-grid kWp is estimated as 5000 $/kWp (EUR 4,310 /kWp). The operation costs are amounted as 2.5 % of capital costs. The estimated cost per tCO_2eq = EUR 136 / tCO_2eq

Zambia Renewable Energy Financing Framework will result in reduction of GHG emissions due to the increase of renewable energy share in the energy mix, and decreasing the use of firewood and charcoal in cooking. The total reduction in emissions amounts to 159, 677 tCO_2eq annually, and 3.9 million tCO_2eq over the programme lifetime. This will occur as a result of the increase in electricity stability, which in turn leads to less deforestation and land use change. The programme will also entail capacity building and technical assistance as well as adaptation co-benefits due to access to energy, diversification of the energy mix and including more sustainable energy resources. The total project financing is $154 million and estimated cost per tCO_2eq is $37.58 / tCO_2eq.

2.2.9 Summary of Reported Financial Requirements

Table 2-11 provides summary to the financial requirements and gaps derived from the desktop review of different document types published by the African Development Bank.

Table 2-11: Summary of reported financial requirements and gaps

Document	Financial requirement	Financial Gap/Support required	Scope	Thematic area	Sector	Notes
Regional Integration Strategy Framework: 2018-2025 (Africa Economic Outlook 2018)	$130–$170 billion/ year $1.3-1.7 trillion (2020-2030)	$130–$170 billion/ year $1.3-1.7 trillion (2020-2030)	Continental	Mitigation Mitigation Unrelated to CC Mitigation/adaptation	Energy: $350-500 billion Transport: $350-470 billion ICT: $40-70 billion WSS: $560-660 billion	Financing gap based on assumption that no resources are mobilized
The New Deal Strategy– Light up & power Africa (2016 – 2025)	$65-90 billion/year	$42-67 billion/year $420-670 billion (2020-2030)	Continental	Mitigation	Energy	Assuming universal access over 10 years Gap = difference between requirements and current investments of $23 billion/year
Feed Africa (2016 – 2025)	$31.5-40 billion/ year $315-400 billion (2020-2030)	$23-31 billion/ year	Continental	Mitigation/adaptation	Agriculture	18 value chains
	$1800 billion (over 10 years)					Gap is calculated based on: AfDB, multilateral and bilateral, public

Document	Financial requirement	Financial Gap/Support required	Scope	Thematic area	Sector	Notes
						and private sector investments will fund roughly $9 billion of transformation of the priority agricultural commodities. Full transformation over 10 years
Improve the quality of life for the people of Africa	$13 billion/year		Continental	Mitigation/adaptation	Water supply and sanitation	
Eastern Africa-Regional Integration Strategy Paper (2018-2022)	Mitigation energy: $6.02 billion Mitigation transport: $8.53 billion	$7.12 billion (2020-2030)	Regional	Mitigation	Energy: $3.96 billion includes *$3.73* billion (hydropower); Transport: $3.23 billion	assuming financing allocation are constant
Central Africa-Regional Integration Strategy Paper: 2019-2025	Mitigation energy: $1.9458 billion Mitigation Transport: $1.541 billion	$1.96 billion (2020-2030)	Regional	Mitigation	Energy: $0.92 billion (hydropower) Transport: $1.04 billion	assuming financing allocation are constant
	Technical/Technological AFOLU: $0.27 billion(2020-2030) Technical/Technological Industry: $0.12 billion	$0.20 billion (2020-2030)	Regional	TT	AFOLU: $0.18 billion Industry: $0.02 billion	

Document	Financial requirement	Financial Gap/Support required	Scope	Thematic area	Sector	Notes
Western Africa-Regional Integration Strategy Paper: 2020-2025	Mitigation energy: $3.17billion (2020-2030) Mitigation transport: $1.17 billion	$2.81 billion (2020-2030)	Regional	Mitigation	Energy: $2.42 billion solar power parks and biogas village Transport: $0.39 billion	Bank commitment: $4.33 billion (2020-2030)
	$2.76 billion	$1.19 billion	Regional	Adaptation	AFOLU: $1.19 billion	
	TT transport: $0.28 billion TT AFOLU: $0.30 billion TT social: $0.11 billion	$0.47 billion	Regional	TT	Transport : $0.18 billion AFOLU-Food security: $0.23 billion Social: $0.06 billion	
Northern Africa-RISP 2020-2026					E	total requirement excludes 2 projects Tripoli-Niamey-N'Djamnea corridor (Lybia) and Africa Trade Platform project (Egypt) – needs not estimated
	Energy: $0.0023 billion Transport: $0.0124 billion	$0.017 billion	Regional	TT	Energy: $0.0023 billion Transport: $0.0124 billion	

Document	Financial requirement	Financial Gap/Support required	Scope	Thematic area	Sector	Notes
	AFOLU: $0.0023 billion				AFOLU: $0.0023 billion	
Africa NDC Hub Gap Analysis of adaptation components	$7.4 billion/year $74 billion (2020-2030)			Adaptation		$7.4 billion: low estimate
Africa NDC Hub Gap Analysis Total Mitigation Needs		$13 billion/year $130 billion (2020-2030)		Mitigation		Conditional needs Estimated based on global emissions reduction cost: $100/tCO$_2$eq reduced.
Climate Change Impacts on Africa's Economic Growth		$289.2 billion to $440.5 billion between 2020-2030	Continental	Loss and damage		
AFAC brochure 2019	$454 billion by 2030			energy sector between 2020-2030		Cumulative investment needs for all renewable energy generation types
Africa NDC Hub Gap Analysis Report: Adaptation needs	$259- $407 billion between 2020-2030	$165.7 billion to $260.5 billion between 2020-2030	total adaptation costs for fulfilling NDC commitments	.		The gap is based only on the reported costs in NDCs, relying on extrapolation of data derived from figures provided by 28 NDCs out of

Document	Financial requirement	Financial Gap/Support required	Scope	Thematic area	Sector	Notes
						the 54 African countries as stated in the report. Annual costs per year until 2020 is reported as $7.4 billion/year
Africa NDC Hub Gap Analysis Report: Mitigation needs	$715billion between 2020-2030	$457.6billion between 2020-2030 (64% of total) will need to be mobilized from international sources		Conditional Mitigation needs for NDCs implementation		Estimated based on global emissions reduction cost: $100/t$CO_2$eq reduced.

To sum up, Table 2-12, Figure 2-18 and Figure 2-19 present the total sectoral adaptation and mitigation needs between 2020-2030.

Table 2-12: Total sectoral needs between 2020-2030 in $billion

Total Sectoral needs between 2020-2030	Adaptation ($billion)	Mitigation ($billion)
Energy	7 – 11[29]	350[30] - 670[3132]
Agriculture/AFOLU	14[33] - 310[34]	-
Transport	-	350 - 470[35]
Water and Sanitation	10.5 – 16.5	-
Biodiversity and ecosystems	7 – 11	-
Health	7 – 11	-
Total	45.5 – 359.5	700 – 1,140

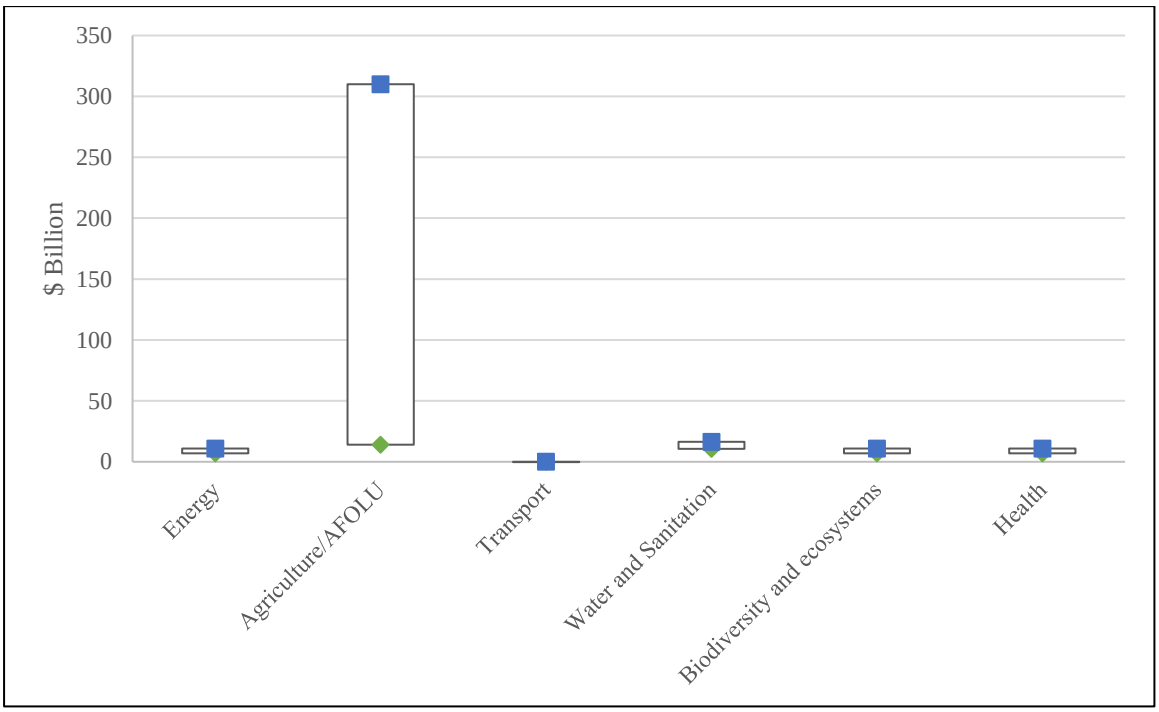

Figure 2-18: Total sectoral adaptation needs between 2020-2030 in $ billion

[29] Average value between low and high ranges derived from Africa NDC Hub's analysis of African NDCs

[30] Derived from Africa Economic Outlook 2018 (range betweeb $350-500 billion)

[31] Upper range value derived from Lightup and power Africa strategy ($420 billion -670 billion).

[32] This range also includes values derived from two other sources. Africa Economic Outlook 2018 estimates $350-500 billion, and IRENA database projects $454billion for renewable energy projects.

[33] Derived from NDCs (lower range of $14-22billion)

[34] Derived from Feed Africa Strategy (upper range of $230-310billion)

[35] Derived from Africa Economic Outlook 2018.

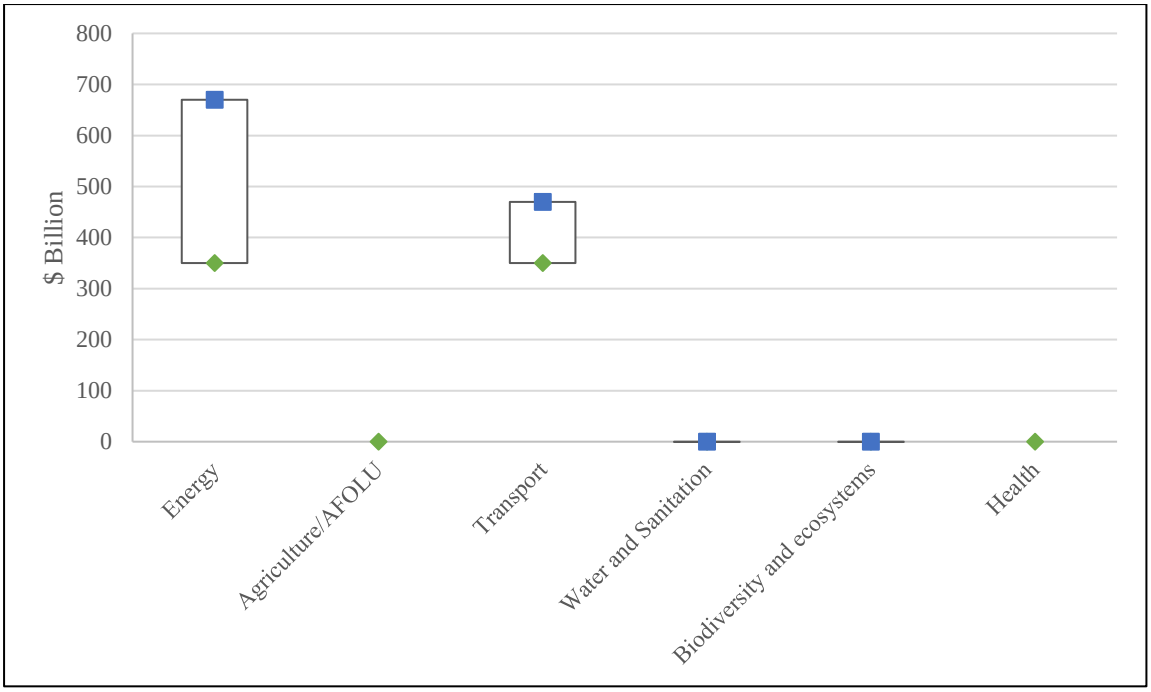

Figure 2-19: Total sectoral mitigation needs between 2020-2030 in $ billion

3 METHODOLOGIES, APPROACHES, AND UNDERLYING ASSUMPTIONS

3.1 Methodologies and Approaches

3.1.1 Technical and Technological Needs

Technical and technical needs are reported in regional strategy papers. In each regional strategy paper, an indicative operational or lending program consisting of projects in priority areas to fulfill objectives of the strategy is defined. The estimation of needs was determined on the basis of costs of projects relevant to technical and technological needs. In this context, methodologies, approaches, and underlying assumptions relate to the selection of priority areas for project. The selection of priority areas for projects constituting Indicative Operational Programs or Indicative Lending Programs is based on:

Lessons learned

Lessons learned from Bank's previous interventions are based on previous strategies, analytical works, evaluation results from the Bank Independent Development Evaluation (BDEV)

Consultative processes

The selection of priority areas was also guided by consultations with stakeholders including regional economic community (REC) such as Arab Maghreb Union, Common Market for Eastern and Southern Africa (COMESA), Economic Community of Central African States (ECCAS), and Central African Economic and Monetary Community (CEMAC) among others. Other stakeholders include Country Economists, national authorities, civil society, development partners, and private sector.

Studies and assessments

One of the steps in the Bank's selection and prioritization tool is the assessment of alignment with national, regional and continental strategies. One of the criteria for selection of priority areas depends on alignment with regional and continental priorities outlined in plans and strategies such as African Union Program for Infrastructure Development in Africa's Priority Action Plan, Regional Integration Strategic Framework 2018-2025, AfDB's High5s strategy documents including the New Energy Deal 2016-2025, and at the national level priorities in country strategy papers. The selection and prioritization process is also based on an assessment of ownership level and policy component determined by a country's confirmed intent to support financing. For fragile states, a fragility assessment tool is also used to determine the impact of the project on addressing fragility and building resilience.

Regional Diagnostic Note (RDN) developed based on sectoral analytical notes and economic sector works (ESWs) have as of 2018 become requirements to guide Bank interventions. Topics covered in regional diagnostic notes relate to themes and sectors such as oil and gas, agriculture, energy, climate change and green growth, transport, Information and Communication Technology, gender, finance, poverty and social development, regional fragility among others. Other types of studies include Bank Technical Notes. In North Africa, for example, technical notes presented during regional consultations included (i) Industrial development and promotion of regional value chains in North Africa; (ii) Energy integration in the Maghreb and Egypt: status, prospects and guidelines; (iii) Transport and infrastructure development for regional integration in North Africa; and (iv) North African financial systems: towards financial integration.

The costs of projects and program are used to determine financing needs. On the regional level, investment estimations for technical and technological needs, defined via soft infrastructural interventions per region were estimated from the difference between total cost of projects and explicitly reported commitments by AfDB and/or other sources.

3.1.2 Adaptation Needs

Adaptation needs in NDC-focused reports consisting of the AfDB's Africa NDC Hub's "Gap Analysis Report" and "Analysis of Adaptation Components in African NDCs" and UNEP reports, Adaptation Gap Report 2016[36] and Africa's Adaptation Gap Technical Report 2014[37].

Projections and extrapolations

Costs for adaptation are not reported consistently by all African countries in their respective NDCS. The estimation of adaptation costs for all countries are determined on the basis of costs available and reported by individual countries, which are extrapolated to determine the projected adaptation costs for the remaining countries.

The Africa NDC Hub reviewed and analysed the African NDCs submitted to the UNFCCC in the reports "Gap Analysis Report", and "Analysis of Adaptation Components in African NDCs". Basis for determining costs include sectoral prioritization defined by the analysis of African NDCs and the estimated adaptation financing gap. The adaptation finance gap is estimated based on the projections and estimations made by the Africa NDC Hub as

[36] UNEP 2016. The Adaptation Finance Gap Report 2016. United Nations Environment Programme (UNEP), Nairobi, Kenya

[37] United Nations Environmental Programme (UNEP), 2014. Africa Adaptation Gap Technical Report :Climate-Change Impacts, Adaptation Challenges And Costs For Africa. [online] UNEP. Available at: <https://www.researchgate.net/publication/266140870_Africa_Adaptation_Gap_Technical_Report_Climate-change_impacts_adaptation_challenges_and_costs_for_Africa> [Accessed 1 July 2020].

referenced from UNEP's Adaptation Gap Report 2016[38] and Africa's Adaptation Gap Technical Report 2014[39].

The annual cost of $7.4 billion projected for adaptation until 2020 was determined by extrapolation of analyzed data from the 28 NDCs that included explicit adaptation costs in their NDCs (out of 48 NDCs).

The adaptation needs for the period 2020-2030 were derived based on the estimations and projections made in the UNEP adaptation gap report. These projections were determined by estimating the adaptation gap, which is the difference between the projected adaptation costs in 2030 and the international climate financing projected to be available for the same year. This approach assumes that the Paris Agreement's commitment of mobilizing $100 billion per year from 2020 is fully met (and potentially increased after 2025), and that this amount is distributed equally between mitigation and adaptation. Based on the assessment of national and sector studies, the report shows that the global annual adaptation needs in 2030 will be 6 to 10 greater than the annual adaptation costs in 2020. The Africa NDC Hub report on Analysis of Adaptation components in African NDCs adapted the same increase figure for African needs, estimating the costs in 2030 at $44.4 to 74 billion to meet African adaptation needs. Therefore, the cumulative costs of adaptation in Africa may be in the range of $259 billion to $407 billion for 2020-2030. Assuming similar commitment levels for fulfilling these costs to the current levels (i.e., 64% from international sources, and 36% from domestic sources)[40], the adaptation financing gap in Africa was determined in the range of $165 billion to $260 billion between 2020-2030.

As for sectoral needs, Africa NDC Hub's Analysis of Adaptation Components in African NDCs report estimated the projected annual adaptation needs for the five top priority sectors based on the assumptions for the increase needed by 2030 (6 to 10 times increase in 2030 compared to 2020 costs) and for the international and domestic resource commitment (64% to 36% respectively).

Studies and assessments

The use of vulnerability assessment model, the Notre-Dame GAIN is referenced in Malawi's Country Strategy Paper.

[38] UNEP 2016. The Adaptation Finance Gap Report 2016. United Nations Environment Programme (UNEP), Nairobi, Kenya

[39] United Nations Environmental Programme (UNEP), 2014. Africa Adaptation Gap Technical Report :Climate-Change Impacts, Adaptation Challenges And Costs For Africa. [online] UNEP. Available at: <https://www.researchgate.net/publication/266140870_Africa_Adaptation_Gap_Technical_Report_Climate-change_impacts_adaptation_challenges_and_costs_for_Africa> [Accessed 1 July 2020].

[40] Africa NDC Hub, 2019. Analysis Of Adaptation Components Of Africa's Nationally Determined Contributions (Ndcs). [online] African Development Bank. Available at: <https://www.afdb.org/fileadmin/uploads/afdb/Documents/Generic-Documents/Analysis_of_Adaptation_Components_in_African_NDCs_2019.pdf> [Accessed 1 July 2020].

3.1.3 Mitigation Needs

Mitigation needs were determined based on reported values from 5 types sources: the Africa NDC Hub's gap analysis report, the African Financial Alliance on Climate Change, Africa Economic Outlook 2018, the New Deal on Energy, and regional integration strategy papers. Country strategy papers for Northern Africa and Southern Africa were reviewed due to incomplete and/or unavailability of current regional integration strategy papers. For each source, the different methodologies used in the documents are presented.

Projections and extrapolations

Mitigation needs were derived on the basis of projected baseline emissions level of CO_2 for 2030 and conditional/unconditional commitment levels, estimates for costs of emissions reduction \$/tCO_2eq.

Based on the mitigation data presented in Africa NDC Hub's gap analysis report, the total mitigation need covering the period 2020-2030 was estimated at \$715 billion. It is calculated based on conditional and unconditional commitments made by African NDCs for the year 2030. Reference baseline emissions estimation at 3,700 MtCO_2eq was projected for 2030. Based on analyzed NDCs, 9% reduction potential can be achieved unconditionally to reduce emissions level down to 3,400 MtCO_2eq. Additional 32% reduction in emissions are reported as conditional commitments upon the receipt of international financing. This additional reduction would reduce emissions down to 2,100 MtCO_2eq (42% total reduction expected from full NDC implementation). Based on the global estimated cost of emissions reduction at just under \$100/tCO_2eq, the total mitigation costs requiring international resource mobilization in the period 2020-2030 were estimated (\$710 billion).

Consultations (questionnaires)

As for sectoral needs for all the five African geographic regions (Northern, Southern, Eastern, Western, and Central) , based on the African Financial Alliance on Climate Change (AFAC) brochure 2018, the cumulative investment needs in the energy sector, which is the topmost priority sector for mitigation are estimated to be \$454 billion between 2020-2030 for all renewable energy generation types (based on reported \$681 billion for 2015-2030 and assuming \$45.5 billion annually and equal yearly allocation). . The reported estimates are referenced from the IRENA[41] statistics database (International Renewable Energy Agency). IRENA statistics are based on data provided by countries via questionnaires and from desk research when data is unavailable.

[41] IRENA publishes detailed statistics on renewable energy generation, costs, and investments trends. The needed data is collected directly from members using the IRENA Renewable Energy Statistics questionnaire and is also supplemented by desk research where official statistics are not available.

African Development Bank lessons learned, consultations, and studies and assessments

Regional mitigation needs determined from Regional Integration Strategy Papers are based on costs of projects screened according to lessons learned, consultations with stakeholders, studies and assessments, which include the Bank's selection and prioritization tool, sectoral works, econometric studies etc described in3.1.1.

Continental mitigation needs in continental strategies such as the Light up and power Africa – The New Deal Strategy on Energy for Africa 2016-2025 are based on consultations with African Countries, energy sector stakeholders, utilities, private investors, foundations and financiers. Investment needs are prioritized according to the highest impact of the investment that can be achieved for beneficiaries (individuals and households) and developmental impacts on the country and sub-regional levels. This is measured by indicators such as percentage of population with energy access and electricity installed capacity in GW. Another selection criterion is the impact on increasing the use of green energy systems and best practice energy efficiency technologies.

Investment needs in the energy sector reported in the Africa Economic Outlook 2018 are determined from the Balmorel energy system model, where actual calculations were based on 12 countries and totaling $7 billion. The methodology to extrapolate for the continent reaching 35-50 $billion/year is not reported.

Underlying assumptions

In addition to the aforementioned methodologies, the selection and prioritization of projects constituting the indicative operational programs described in regional integration strategies is also based on underlying assumptions, which consist of using socio-economic development indicators and targets such as increasing access to electricity and clean water and physical indicators such as new energy capacity (MW), new/upgraded roads (km), and Africa Infrastructure Development Index (AIDI) scores.

Methodologies In the present report

Annual needs from the reviewed sources were extrapolated to reflect needs for 2020-2030 by multiplying such annual needs by 10 years. Where annual costs were not reported in the reviewed sources, as is the case for regional integration strategies, needs were first determined as the difference between total costs of projects and explicitly reported commitments by the Bank or other financing sources. The resulting value was then divided by the strategy's timeframe to obtain an annual need, which was then multiplied by the required years to reach 2030. For the Eastern Africa and Central Africa strategies, the time frames were 2018-2022 and 2019-2025, respectively. To normalize the timeframe, two and one year were deducted to reflect the lower end of the timeframe 2020, and 8 and 5 years added to reflect the higher end of 2030. In the case of North Africa and Western Africa, needs corresponding to 4 and 5 years were added.

3.1.4 Loss and Damage Needs

Studies and assessments

The "Climate Change impacts on Africa's Economic Growth" report provides a continental coverage, assessing the impacts of climate change on economic growth of the 5 African regions: Northern, Western, Southern, Eastern, and Central Africa. The approach in this report rely on empirical climatological and socioeconomic evidence in the five African regions on the macroeconomic scale, complemented by five country case studies (Morocco, Ethiopia, Mozambique, Nigeria and Togo). The assessment is carried out for two warming potential based on the Paris Agreement target of 2 degrees maximum increase in global average temperature.

The report presents costs related to residual damages, anticipatory adaptation investments, and reactive adaptation costs, i.e., loss and damage costs were reported in the Climate Change Impacts on Africa's Economic Growth report for each Region as % of GDP in the year 2050 for high global warming scenario (average temperature exceeds 4 degrees), and low warming scenario (average temperature is maintained below 2 degrees). Based on the Gross Regional Product (GRP), referenced from the Regional Economic Outlook reports published in 2020 by the AfDB, the total needs for the period 2020-2030 were then estimated at $ 440.5 billion and $289.2 billion for high and low warming scenarios, respectively.

3.1.5 Capacity Building Needs

Capacity building requirements were outlined as projects in indicative operational programs selected according to the Bank's selection and prioritization guidelines as well as through stakeholder consultations. Bank and other financing commitments, however, were sufficient and no needs were deduced from projects in indicative operational programs.

3.2 Comparison of Methodologies and/or Approaches Adopted for Needs Determination

Common methodologies and approaches and underlying assumptions to determining needs were identified across reviewed documents.

A summary of methodologies and underlying assumptions used to determine needs across thematic areas in shown in **Error! Reference source not found.**.

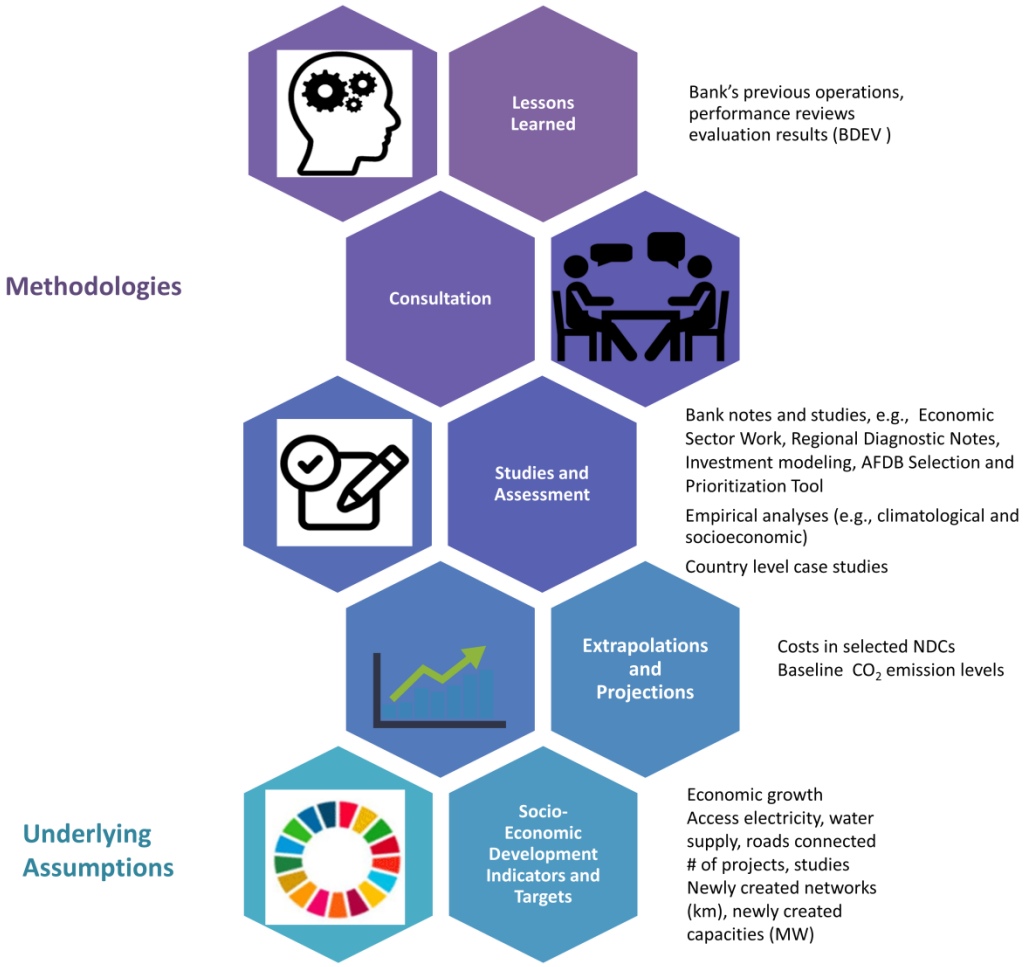

Figure 3-1: Principal Methodologies and Underlying Assumptions for Determination of Needs

Methodologies

Lessons learned were used in regional and continental strategies. Lessons learned from previous Bank interventions such as implementation of previous strategies are outlined in review reports and assessments. Examples include Regional performance portfolio review RPPR, Bank's evaluation results from Bank's Independent Evaluation Department to determine priority areas. Relying on lessons learned allows a continuation and targeting of efforts in priority areas and provide guidance on where needs can be expected. For example, the new results framework allows assessing results and monitoring of Bank performance according to criteria. One type of performance criteria is amount of mobilized co-financing, which can help identify needs. Another example is the Bank's Regional performance portfolio review, which can help determine needs based on a quantitative assessment of achieved development targets (e.g., access to services electricity, water supply etc.) resulting from regional project operations. Lessons learned can be used to inform on further projects with clear quantitative expected outcomes that can help estimate needs.

The second common approach relies on consultative and stakeholder engagement process at the national and regional levels via Country Economists and Regional Economic

Community members, respectively. Consultative approach was also reported for collection of statistical data used to estimate investment needs in the energy sector (IRENA[42]) Consultations facilitate political buy-in and ownership of policies and reforms. For example, in North Africa high policy dialogue was reported as key to identifying and agreeing on priority areas for Regional Integration. Consultations allow for cohesive and region specific representation of needs. Consultations also allow identification of needs that would otherwise be more complex to determine such as institutional capacity building, and needs related to complex sectors such as agriculture. A disadvantage of consultative process relates to the subjectivity and dependence of priorities on authority consulted, which can be motivated by different interests (e.g., political economy). An extreme example is that of North Africa, where regional integration is not a priority across the countries. Implications on financing needs include inaccurate/incomplete representation of needs leading to under or even lack of estimates for financing needs.

The third common approach classified under studies and assessment. Bank studies and assessment involved aligning goals and priorities between regional, continental strategies, and national development goals and priorities strategically and operationally. Alignment of priorities and goals can facilitate resource allocation and unify and direct efforts to achieve priorities across sectors and climate change mainstreaming). Disadvantages may result if country level priorities are not mainstreamed with climate change objectives and/or SDGs relating to climate action. Also related to the possible lack of climate change mainstreaming, operationally, projects are based on development targets (e.g., Indicative Operational Programs are usually defined by sector and type of operation), but do not explicitly or consistently state climate change action benefits or contributions. The only exception was Western Africa-Regional Integration Strategy Paper, where Indicative Operational Programs include climate and green growth and classification of projects with associated contributions to climate change vulnerability, low carbon development and resilience and ability to attract climate finance. Studies and assessment also included empirical climatological and socioeconomic studies used for estimation of loss and damage.

The fourth approach is based on extrapolations and projections. Extrapolations were used to overcome gaps in NDC related costs for adaptation and mitigation. Projections were used for baseline emission levels of CO_2 and estimations of mobilized resources based on which needs and financing gaps were determined. Extrapolations and projections provide a simple method to estimate continental needs. However, uncertainties relating to normalization of individual country needs required to perform extrapolations may not accurately represent actual individual needs.

Underlying assumptions

[42] IRENA publishes detailed statistics on renewable energy generation, costs, and investments trends. The needed data is collected directly from members using the IRENA Renewable Energy Statistics questionnaire and is also supplemented by desk research where official statistics are not available.

Common underlying assumptions used for the determination of needs are based on socio-economic development indicators and physical parameters. Indicators include access to services such as electricity access rates% and clean water supply, time to reach destination (min, hours) via new/upgraded networks (road, marine, air), infrastructure index used in models for investment needs, % contribution to GDP. Physical parameters include newly created or upgraded roads (km) and energy capacity (MW) . The use of socio-economic indicators and physical parameters allows a quantitative measure linking project and outcomes. However, relying on socio-economic indicators based on implemented projects may underestimate needs not translated into projects. This is particularly true for capacity building and institutional strengthening needs, which can be more complex to determine and quantify compared with projects having clear quantifiable outcomes such as achieving targets.

A summary of the analysis of common methodologies, approaches and underlying assumptions used to determine needs are presented in **Error! Reference source not found.** and Table 3-2.

Table 3-1: Comparison of Methodologies to Determine Needs

Methodology, and approach to determination of needs based on:	Document type/description	Advantages	Disadvantages	Implications on determining financing needs for climate action
Lessons learned from previous interventions, experiences, or strategies	RISPs: Lessons learned from previous Bank interventions including RDN, BDEV	Iterative process: Continued, adapted to 'new' needs and targeted efforts building upon identified regional needs	May not be completely inclusive of disaggregated national level priorities May not be consistently and completely translated operationally	Underestimated overall financing needs due to potential accumulated country-level underestimations
	Ten Year Strategy (TYS) 2013-2022: lessons learned from the Medium Term Strategy 08-12 CCAP-II 16-20: from CCAP-I 11-15 High Five documents: from previous experiences and initiatives	Building on previous successes; avoiding similar failures; and setting out measures to address risks, challenges and barriers at an early stage Evolution of the results monitoring framework	Overlooking other issues that might not be reported as a lesson learned	
Consultative approach	TYS 2013-2022, High5s, CSPII-Egypt15-19: Consultations with key stakeholders	Ensuring that the identified needs consider the views, concerns, and interests, and needs of the different stakeholders	No explicit information on the needs for climate actions, albeit it is one of the main drivers behind change	
	RISPs: Consultative Process with national authorities, and regional entities	Ensures/facilitates political buy-in Allows practical region specific identification of needs	May be motivated by other interests	Incomplete representation of needs leading to under or even lack of estimates for financing needs.
	NDC implementation Gap Analysis: Consultative process (survey) with NDC focal points on NDC implementation challenges	Streamlined consultation process (survey) makes it easier for identifying	No data verification: It depends on what the countries are willing to	The approach helped identifying the most urgent challenges captured from NDCs:

Methodology, and approach to determination of needs based on:	Document type/description	Advantages	Disadvantages	Implications on determining financing needs for climate action
		common gaps and challenges. The approach captures what countries have started doing well and areas where additional effort is required to achieve NDCs.	share or report, increasing uncertainty levels	• Financial resources • Technology • Capacity Building Needs • Institutions • Socio-economic situation • Legal framework • Availability of climate data Technical Assistance
Studies and assessments including assessment of alignment with national, regional, continental priorities in strategies and plans, Bank's selection and prioritization tool, Bank notes (technical, economic etc.) and empirical analyses	High5 Jobs for Youth: Alignment with: other strategies and High 5 priority areas AFS 14-19 and OG: other country and regional documents and the Bank's operations Progress Report on CCAP 11-15: RISPs and CSPs and prioritizing national and regional projects CCAP-II 2016-2020: High 5s, SDGs, Gender strategy and action plan, and priority areas in the African NDCs CSPII-Egypt 2015-2019: national goals, priorities, challenges and SDS 2030	Taking into account developmental needs of the country, region and the entire continent Mainstreaming developmental needs, sustainable development and climate actions Decoupling development from CO_2 emissions Identifying specific needs of fragile states	Assessments based on financial commitment of host countries as selection criteria may result in screening out of potential climate related projects.	Complexity in identifying needs such as capacity building may result in underestimation of needs

Methodology, and approach to determination of needs based on:	Document type/description	Advantages	Disadvantages	Implications on determining financing needs for climate action
	Addressing Fragility and resilience in Africa strategy 2014-2019 and Operational Guidelines: Key stakeholders needs and concerns (governments, citizens, development partners)			
	RISPs: Alignment with development goals and priorities in national (CSPs), regional, continental strategies	Unified and directed efforts to achieve priorities, effective resource management aligned/associated with outcomes pertinent to climate change (vulnerability, low carbon development → increase ability to attract climate finance	Country level plans and strategies may Not be consistently aligned with climate related plans and strategies (NDCs)	unidentified needs
	"Climate Change impacts on Africa's Economic Growth" Identifying projected climate change impacts in Africa by 2030 and 2050 on the basis of empirical climatological and socioeconomic evidence in five regions on the macroeconomic scale (Northern, Eastern, Southern, Central, Western Africa), and five country case studies (Morocco, Ethiopia, Mozambique, Nigeria and Togo)	Empirical evidence yields results that better reflect the dynamic nature of CC impacts over time depending on projected human behaviors. Case studies allow practical comparison with empirical results	labor and time intensive analysis Requires numerical data collection from multiple sources, and parameters (qualitative and quantitative) Requires consistent and comparable sets of data, which are difficult to obtain across many African countries	The study was conducted on regional level, and may have overlooked country-specific projected impacts

Methodology, and approach to determination of needs based on:	Document type/description	Advantages	Disadvantages	Implications on determining financing needs for climate action
			It is not a dynamic simulation, and newer studies based on latest mitigation and adaptation measures is needed regularly	
Extrapolation	**Estimation of adaptation financing costs:** sum of adaptation costs provided by African countries in their NDCs. **Extrapolation of data derived from figures provided by 28 NDCs**	Provide rough estimate to the total adaptation costs needed for all African countries, by projecting data received from few countries.	Many NDCs did not provide complete information on adaptation measures (lack of quantitative and qualitative data) Difficulty in distinguishing adaptation from development finance, as well as the methodological challenges involved in the economic assessment of adaptation	Uncertainty associated with extrapolation in determining adaptation financing needs. Multiple re-estimations are needed to update the estimated financing costs based on newly reported/identified data or information. This can affect funds mobilization and disbursement cycles (time consuming)
Projections	Estimation of mitigation costs in 2030 based on the projected emissions gap, conditional and non-conditional commitments made in NDCs, projected reduction potential, and the average cost per unit of emissions reduction as adapted from UNEP's Emissions Gap Report 2017.	Provide estimations based on the projected mitigation potential in Africa	Estimation is based on cost of unit reduction in 2020, which is likely to change over the years as technologies mature (e.g., solar PV costs are expected to decrease)	Uncertainties resulting from incomplete/inaccurate data gathered from NDCs Under-over estimations due to changing costs of unit emissions reduction

Methodology, and approach to determination of needs based on:	Document type/description	Advantages	Disadvantages	Implications on determining financing needs for climate action
	AFAC 2019: climate change needs US $3 trillion investments in Africa by 2030 based on projections derived from African NDCs	The estimation of the potential pool of investment helps better gauge the opportunities investors have in climate financing. It highlights that high returns on investment can be realized from climate financing, which can incentivize and attract private financing sources	No methodology reported on the projected total investment opportunity	Uncertainties associated with projections based on a number of countries may result in underestimations of investment needs

Table 3-2 Underlying assumptions, their advantages, disadvantages, and implications on Determining Needs

Underlying assumptions to determination of needs based on:	Document type/description	Advantages	Disadvantages	Implications on determining financing needs for climate action
Socio economic Indicators and physical parameters	RISPs: indicators used in modeling of sectoral investment needs such as electricity access rates, number of studies and received assistance. Physical parameters such as newly created networks (km) etc.	Quantitative measure linking project and outcomes	CB and institutional strengthening needs may be more complex to translate into number of studies and assistance requirements	Underestimation of needs not translated into projects or studies
	TYS 2013-2022: Development indicators as basis for determination of needs High 5 Jobs of Youth: Indicators for evaluating the implementation	Robust monitoring and evaluation system for the implementation of the strategy	No target values (baseline only) for the provided indicators relevant to CC mitigation in some documents (e.g. TYS13-22)	Uncertain priorities and improper planning due to the lack of defined targets and indicators for climate actions, which conduce to

	The New Deal and Light Up Africa: Indicators on the investments impacts High5 Feed Africa Strategy: Prioritization criteria based on different indicators & indicators to evaluate the implementation of the strategy		No particular indicators to measure the impact of CC activities, especially Mit. actions, (e.g. number of MWs generated by renewable energy resources, or saved from utilizing energy efficient technologies, tCO_2 reduced, number of population affected by extreme weather events, etc.)	inaccurate estimation of financing needs

4 GAPS AND CHALLENGES FOR DETERMINATION OF NEEDS

This chapter addresses gaps due to methodological challenges identified during the needs determination process.

4.1 Available Data and Information On Needs

4.1.1 Technical and Technological Needs

Explicit technical and technological needs were determined from Indicative Operational Programs. Gaps in determined needs can result from incomplete representation of projects in Indicative Operational Programs, for example if needs are not explicitly reported or translated as projects.

Technical and technological needs are deduced from challenges identified in the reported estimates relevant to mitigation and adaptation in NDCs, and loss and damage. With respect to mitigation and adaptation, the approach adopted in the NDC Gap Analysis relies on a consultative process (surveys) with national focal points on NDC implementation challenges. The gaps and challenges of this approach include lack of verification of the reported data in the NDCs and relying primarily on what countries are willing to share or report, thus increasing uncertainty levels in the collected data. Another identified gap include the lack of common methodologies adopted in determining needs in NDCs, which result in difficulty in aggregating the collected data (i.e., comparability challenges).

With respect to loss and damage, comparability challenges were identified in the approach adopted in the study of "Climate Change Impacts on Africa's Economic Growth". The analysis is rooted in empirical climatological and socioeconomic evidence in Africa's five regions on the macroeconomic scale. Empirical analyses require numerical data collection from multiple sources and parameters (qualitative and quantitative), and require consistent and comparable sets of data, both of which are difficult to obtain across many African countries.

4.1.2 Adaptation Needs

Only 28 countries reported quantitatively on their adaptation needs in their NDCs (out of 48 analyzed NDCs). The extrapolation methodology adopted in estimating total adaptation needs for all African countries underline gaps and challenges including:

- Lack of sufficient quantitative data to determine adaptation needs for all African regions/countries[43]
- Lack of sufficient quantitative and qualitative data on climate finance tracking for adaptation or mitigation (completeness issues)

[43] AfDB (2020). Climate Change Impacts on Africa's Economic Growth. Available at https://www.afdb.org/en/documents/climate-change-impacts-africas-economic-growth (accessed: August 2020)

- Comparability limitations due to differences in costs estimation of adaptation financing needs in African NDCs[44]
- Difficulty in distinguishing adaptation from development finance, as well as the methodological challenges involved in the economic assessment of adaptation. As a result, estimated adaptation needs are likely to have high levels of uncertainty.
- Lack of definition of infrastructure projects as adaptation or mitigation
- Not all NDC provided the same level of climate finance details and there was a wide range of different climate finance figures expressed. Only a few countries have differentiated between types of climate finance sources (external, domestic, public, and private) in their NDCs[45].

Gaps in adaptation costs determined from projects in indicative operational programs may result from incomplete translation of needs into projects. Reasons for the incomplete representation can be due to the Bank's selection and prioritizing tool. Another underestimation may be related to the lack of consistent classification of projects as adaptation. Only Western Africa specifies projects where climate change and green growth are mainstreamed within the indicative operational program.

4.1.3 Mitigation Needs

Similar to adaptation needs, the total mitigation costs are estimated based mainly on the costs reported in only 31 African NDCs for the year 2030 and a projected baseline emissions scenario for the same target year 2030. The estimation distinguished between conditional and unconditional commitments reported in NDCs. Completeness and comparability issues raise the levels of uncertainty in the extrapolated totals, since not all countries reported mitigation costs in their NDCs, and the methodologies adopted in identifying and tracking mitigation financing may not be the same across all African countries. Furthermore, not all NDC provided the same level of climate finance details and there was a wide range of different climate finance figures expressed. For example, only a few countries have differentiated between types of climate finance sources (external, domestic, public, private) in their NDCs.

The total mitigation needs are estimated based on current costs of technologies and future projections that add uncertainty to the estimations. Due to the evolution of technologies, and changes in cost over few years, one of the challenges in determining mitigation costs is the need for timely multiple re-estimations in order to update the estimated costs based on newly reported/analyzed data or information (i.e., time and capacity challenges).

[44] AfDB Africa NDC Hub (2019). Analysis of Adaptation Components in African NDCs. Available at https://www.afdb.org/fileadmin/uploads/afdb/Documents/Generic-Documents/Analysis_of_Adaptation_Components_in_African_NDCs_2019.pdf (accessed: August 2020)

[45] AfDB Africa NDC Hub (2018). African NDCs Gap Analysis Report. Available at https://www.afdb.org/fileadmin/uploads/afdb/Documents/Generic-Documents/African_NDCs_Gap_Analysis_Report.pdf (accessed: August 2020).

On the regional level, for mitigation needs determined on the basis of Indicative Operational Programs in regional integration strategy papers, gaps may result from incomplete reflection of needs into projects in Indicative Operational Programs. For example, the projects in the Indicative Operational Programs of Eastern Africa for 2018-2022 do not include agriculture related operations. In contrast, the active portfolio for Eastern Africa includes agri-related operations constituting 13% of total Bank commitment. Considering that agriculture has potential to grow and presents potential opportunities for climate-smart agriculture, its absence from the updated projects may point to a gap. Reasons may be related to the screening process by the Bank, which includes criteria such as confirmed countries financial commitments.

With respect to costs of climate proofing investments, for example, for urban infrastructure, according to the AfDB publication "Paving the way for climate-resilient infrastructure: Building sustainable cities and low-carbon mobility in Africa", an estimated $20-25 billion in investments are needed in basic urban infrastructure. Additional costs for climate-proofing were identified as a need in the report, yet without quantification highlighting a gap.

4.1.4 Climate Financing Enabling Environment Needs

With respect to developing an enabling environment for climate finance, most reports express the need for private sector investment as a key source of financing for climate related projects; however, few emphasize the need for national level MRV of climate financing. Adequate standardized systems allow tracking and mapping of flows, which can help identify opportunities and/or inefficiencies to further improve the financing strategy. Furthermore, market-based barriers and the need for associated mitigation approaches such as risk sharing instruments are predominantly reported; however, needs for plans or assessment studies for capacities and knowledge to develop diversified strategies, for example, considering mixing of instruments and approaches including mixing solutions such as blending to accessing and delivering climate finance are not systematic.

The increasing internal and external debt levels across Africa is a major challenge in determining the actual needs for improving the enabling financing environment, as it has direct impact on the financial flows to Africa, including foreign direct investment (FDI), and international development financing. The impacts of internal and external debts across African countries depends on their national conditions and socio-economic circumstances. The increasing debts can be attributed to the increasing ratio of debt to gross domestic product (GDP), the increasing debt servicing costs (i.e. interest payments) due to the increased non-concessional loan financing for development, and poor public financial management. As of 2018, 19 out of 54 countries in Africa exceed the 60% debt-to-Gross Domestic Product (GDP) threshold prescribed by the African Monetary Co-operation Programme (AMCP) and 24 countries have surpassed the 55% debt-to-GDP ratio suggested by the International Monetary Fund (IMF). Figure 4-1 illustrates the debt to GDP ratio of sub-saharan African coutnries. Exceeding these thresholds imply that these countries are

highly vulnerable economically and their governments have fragile abilities to provide support to the economy, including the introduction of new economic instruments and promotion of private sector engagement via loans and funding agreements that could intensify debt levels.

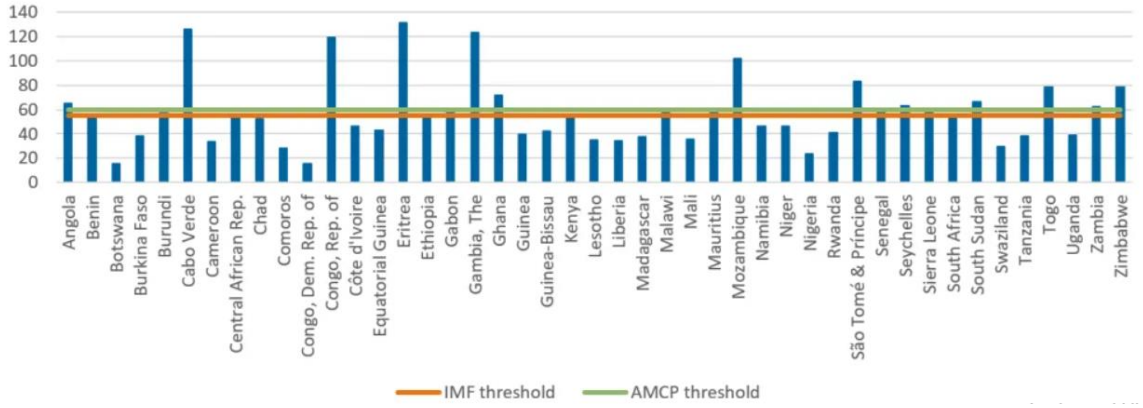

Figure 4-1 Government debt levels (as % of GDP) in African countries. Source: IMF Regional Economic Outlook – Sub Saharan Africa 2018)

4.1.5 Capacity Building Needs

Capacity building needs were not reported in the reviewed documents. In regional integration strategies, costs for capacity building projects were covered by Bank and other co-financing sources. However, needs derived from costs projects in indicative operational programs are likely underestimated as the projects undergo a screening process. Therefore, reported costs of projects are likely not reflective of actual CB needs. Gaps in quantitative estimates for capacity building may also be due to methodological challenges. For example, the underlying assumptions adopted in determining needs for mitigation projects in some Regional Integration Strategy Papers include socio-economic development indicators used in modeling of sectoral investment needs, number of studies and received technical assistance. For determining capacity building and institutional strengthening needs, it may be complex or challenging to translate indicators and modelling results into training requirements, which result in potential underestimation of needs that are not translated into projects. Furthermore, complexity may be related to the generalized descriptions of capacity building needs and expected outcomes, where insufficient data precludes translation into projects and quantifiable terms. For example, one of the principal factors influencing training cost estimates is scale (e.g., number of trainees, institutions, regional and national levels etc.), which require defining for accurate cost determination.

The analysis of adaptation components in African NDCs highlighted gaps including a lack of data and synergy between sectors and institutions, and incomplete disclosures of the needs for policy strengthening to support the development and implementation of National Adaptation Plans (NAP) (lack of political will). Only four countries explicitly mentioned needs in their NDC.

Capacity building gaps and challenges hindering the implementation of the NDCs include[46]:

- Lack of institutional and technical capacity to identify opportunities for maximizing mitigation/adaptation co-benefits from the implementation of projects in different sectors to achieve climate change targets
- Lack of enabling frameworks to ensure effective and efficient provision of capacity-building and technology funding.

In the context of climate finance environment, gaps in determining estimates for capacity building needs can prevent access to climate finance. For example, the lack of rigorous support on project feasibility, identification and development (i.e., preparing bankable proposals), may limit access to climate financing form Africa Climate Change Fund (ACCF annual report 2018). On a similar note, gaps in project feasibility, development and preparation and capacity building are reported in the Trust Funds Annual report 2018, but are not quantified.

[46] Africa NDC Hub, 2018. Gap Analysis Report: Nationally Determined Contributions (Ndcs). [online] African Development Bank. Available at: <https://www.afdb.org/fileadmin/uploads/afdb/Documents/Generic-Documents/African_NDCs_Gap_Analysis_Report.pdf> [Accessed 1 July 2020].

Methodological gaps, challenges, and opportunities in determining Africa's needs (adaptation, mitigation, capacity building, technological/technical) in the reviewed documents are presented in Table 4-1.

Table 4-1: Methodological gaps, challenges, and opportunities in determining financing needs in regional integration

Thematic area	Document type	Processes, methodology, underlying assumptions	Need	Gaps/challenges	Opportunities including instruments to overcome challenges
Technical/Technological	RISP	Lessons learned from previous Bank interventions to determine priority areas, which translate into the IOPs: # and cost of projects in IOPs	Infrastructural financing for soft interventions (project preparation)	Lessons learned strategically may not be comprehensively translated into project operations leading to under estimation of financing need	
	Africa NDC Hub	NDC implementation Gap Analysis approach: Consultative process (survey) with NDC focal points on NDC implementation challenges	Technical/technological needs (knowledge production)	No verification of the reported data in the NDCs. No common methodologies adopted in determining needs in NDCs	Identifying needs for robust knowledge production and management
	Publication: Climate Change Impacts on Africa's Economic Growth	identifying projected climate change impacts in Africa by 2030 and 2050: Analyses in this report are rooted in empirical climatological and socioeconomic evidence in five regions on the macroeconomic scale (Northern, Eastern, Southern, Central, Western	Technological/technical needs (knowledge production)	Requires numerical data collection from multiple sources, and parameters (qualitative and quantitative) Requires consistent and comparable sets of data, which are difficult to obtain across many African countries	Identifying technological needs in order to improve climate related knowledge production and management

Thematic area	Document type	Processes, methodology, underlying assumptions	Need	Gaps/challenges	Opportunities including instruments to overcome challenges
		Africa), complemented by five country case studies (Morocco, Ethiopia, Mozambique, Nigeria and Togo)			
Adaptation	Africa NDC Hub	Estimation of adaptation financing costs: sum of adaptation costs provided by African countries in their NDCs. Extrapolation of data derived from figures provided by 28 NDCs	Adaptation need	lack of sufficient quantitative and qualitative data on climate finance tracking (for adaptation or mitigation) Differences in costs limits the comparability of adaptation financing needs in African NDCs. Difficulty in distinguishing adaptation from development finance, as well as the methodological challenges involved in the economic assessment of adaptation	Support for updating climate finance tracking mechanisms (Last updated in 2012), in order to ensure rigorous criteria for reporting on climate finance needed or received (what needs to be reported as climate finance, and how it should be reported)
Mitigation	Africa NDC Hub	Estimation of mitigation costs in 2030 based on the projected emissions gap, conditional and non-conditional commitments made in NDCs, projected reduction potential, and the average cost per unit of emissions reduction as adapted from UNEP's	Total Mitigation needs	Estimation is based on cost of unit reduction in 2020, which is likely to change over the years as technologies mature (e.g., solar PV costs are expected to decrease). Uncertainties resulting from	Support for updating climate finance tracking mechanisms (Last updated in 2012), in order to ensure rigorous criteria for reporting on climate finance needed or received (what needs to be reported as climate finance, and how it should be reported)

Thematic area	Document type	Processes, methodology, underlying assumptions	Need	Gaps/challenges	Opportunities including instruments to overcome challenges
		Emissions Gap Report 2017.		incomplete/inaccurate data gathered from NDCs	
	AFAC	Regional needs for the renewable energy sector by 2030 are adapted from the IRENA statistics database, and using the same assumptions made for the total mitigation costs by the Africa NDC Hub Gap analysis report and UNEP's Emissions Gap report	Mitigation needs in the renewable energy sector	Discrepancy in estimations between reported needs in NDCs and renewable energy sector needs ($130billion in total for mitigation Vs. $454billion reported for renewable energy in the same period 2020-2030)	Coordination in order to align sectoral plans with national plans and NDCs. Institutional strengthening to improve project identification and preparation support, and establish clear common methodologies for financing needs estimation MRV in order to improve mitigation finance tracking
	RISP	Lessons learned from previous Bank interventions to determine priority areas, which translate into the IOPs: # and cost of projects in IOPs	Mitigation need: Infrastructural financing for hard interventions	Lessons learned strategically may not be comprehensively translated into project operations leading to under estimation of financing need	
Loss and Damage	Publication: Climate Change Impacts on Africa's Economic Growth	identifying projected climate change impacts and loss and damage costs in Africa by 2030 and 2050: Analyses in this report are rooted in empirical climatological and	Loss and damage needs & Technological/technical needs (knowledge production)	Requires numerical data collection from multiple sources, and parameters (qualitative and quantitative) Requires consistent and comparable sets of data,	Identifying technological needs in order to improve climate related knowledge production and management

Thematic area	Document type	Processes, methodology, underlying assumptions	Need	Gaps/challenges	Opportunities including instruments to overcome challenges
		socioeconomic evidence in five regions on the macroeconomic scale (Northern, Eastern, Southern, Central, Western Africa), complemented by five country case studies (Morocco, Ethiopia, Mozambique, Nigeria and Togo)		which are difficult to obtain across many African countries	
Finance	RISP	# of PPPs, amount of resources mobilized	Finance need: Co-financing Multi-lateral finance agreement	Outcomes of Indicative Operational Programs not explicitly linked to climate change vulnerability, low carbon development plans; Context for total resources required not estimated, i.e., contribution to financing gap not defined Bankability of energy projects	Access to different financing instruments can be enhanced by identifying and defining climate change contributions of IOPs (e.g., WA-RISP) Developing instruments such as Africainvest, African50
	AFAC	AFAC brochure 2019: Attracting private investments to increase Africa's share of global climate finance and help African countries achieve their NDCs in alignment	Finance needs (private sector financing)	Approach is generic and does not provide indicators to assess its performance (no targets defined, no time-frames provided). Data gaps between high-level drivers and	Identifying the potential of private sector engagement in bridging climate financing gaps

Thematic area	Document type	Processes, methodology, underlying assumptions	Need	Gaps/challenges	Opportunities including instruments to overcome challenges
		with high5s, SGDs, and national priorities AFAC Drivers for mobilizing funds: • Paris Agreement and Sustainable Development Goals • Financial Sector Assets under management, globally • Increasing Africa's 3% global share of climate finance • Africa is most vulnerable to climate change		regional/national drivers for determining financing needs.	
Capacity Building	RISP	Qualitative need	Capacity Building need	Not easily quantifiable	
	SEFA	Eligibility criteria for project preparation Grants by SEFA: Projects must be implemented in an AfDB regional member country Total project size must be between $30 million and $200 million (small to medium scale)	Capacity building (project preparation grants)	The definition of small-medium scale is based mainly on project costs, which are estimated at the time of proposal writing. During the due-diligence process, project costs may increase over time and may exceed the $200m cap.	Capacity strengthening for streamlining of project due-diligence process to expedite approvals and funds disbursement

Thematic area	Document type	Processes, methodology, underlying assumptions	Need	Gaps/challenges	Opportunities including instruments to overcome challenges
		Grant co-funding varies up to $1 m, a minimum co-financing requirement of 30%.		SEFA primarily targets small to medium scale projects, but not large or mega-scale projects that may also require project identification/preparation support.	
	AfDB Work Programme and Budget 2019-2021	2019-2021 AfDB Work programme: Approach for developing Indicative Operational Programme (IOP): Accelerated delivery of the High 5s and crosscutting priorities. Aligns with The Bank's reforms to strengthen delivery capacities, expedite loan approval and disbursement at advanced stages	Capacity building needs	Approach does not set targets for project delivery, capacity strengthening, increased and faster approvals (no time-frame provided), or disbursement steps for advanced stages	The IOP focuses on bridging financing needs/gaps addressing key development challenges in Africa: • lack of electricity • food insecurity • infrastructure gap, • low intra-regional trade • low employment, especially for the youth and women
Cross-cutting	Africa NDC Hub	NDC implementation Gap Analysis approach: Consultative process (survey) with NDC focal points on NDC implementation challenges	Costs needed for NDC implementation (adaptation, mitigation, capacity building, and technological)	No verification of the reported data in the NDCs. No common methodologies adopted in determining needs in NDCs	Identifying needs for robust knowledge production and management

Thematic area	Document type	Processes, methodology, underlying assumptions	Need	Gaps/challenges	Opportunities including instruments to overcome challenges
	Ten Year Strategy 2013-2022 High5 – The New Deal & LightUp Africa 2016-2025 High5-Feed Africa Strategy 2016-2025			Ten Year Strategy & The New Deal on Energy Strategy included only lump sum numbers for the total infrastructure needs in the country and energy sector infrastructure needs, respectively, whereas Feed Africa Strategy entailed more details (information on the needs for each enabler). Nevertheless, the lack of further specifics hinders the determination of accurate climate needs. However, they do not contain breakdown of the pertinent needs to implement each pillar and achieve the desired targets. The absence of the needs specifics might result in double counting of needs, uncertainty, etc. For instance, calculating capacity building as a separate need, then including it in the required soft infrastructure.	

Thematic area	Document type	Processes, methodology, underlying assumptions	Need	Gaps/challenges	Opportunities including instruments to overcome challenges
				Another example is that it is not clear whether the reported $100 billion in the Ten Year Strategy includes soft infrastructure needs, agricultural infrastructure needs, etc. Therefore, this represents a challenge in determining adaptation, mitigation, technological, or capacity building needs that are relevant to the context of these strategies.	

5 OPPORTUNITIES FOR DETERMINATION OF NEEDS

According to the identified gaps and challenges, opportunities, where applicable, to the determination of needs are addressed in this section.

5.1 Technical and Technological Needs

Challenges related to estimation of costs for mitigation, adaptation, and loss and damage highlight the need for technical/technological assistance to improve climate-related knowledge production and management for improved accuracy, completeness, and comparability of determined needs.

5.2 Adaptation Needs

In order to overcome the identified challenges, it is essential to ensure that rigorous climate financing tracking mechanisms are in place. The existing climate finance tracking guidance manuals published by the AfDB were last updated in 2013[47]. Therefore, updating the tracking process and the guidance manual will provide streamlined criteria for reporting on climate finance needed or received (what needs to be reported as climate finance, and how it should be reported), thus improving accuracy of the data used to estimate climate financing needs for both mitigation and adaptation. Costs related to improving the financing tracking mechanisms (guidance manuals) should also be accounted for in the total financing needs.

5.3 Mitigation Needs

Gaps and challenges related to identifying mitigation needs can be tackled by addressing completeness and comparability issues during the analysis of submitted NDCs. Developing common methodologies can reduce uncertainty of reported data, and provide common approach for identifying and tracking mitigation financing in all African countries. The Paris Agreement's Modalities, Procedures, and Guidelines (MPGs) also provides an opportunity to improve completeness, comparability, and overall quality and transparency of reported data and needs. In addition, regular re-estimations of mitigation needs are needed in order to update the estimated costs based on newly reported/analyzed data or information (i.e., address time and capacity challenges). Moreover, estimation of climate-proofing costs of the Bank's ongoing operations is important to achieve the Bank's target of reaching 100% climate-proofed operations by 2020.

[47] Latest AfDB Climate Finance Tracking Guidance Manual was published in 2013. Available at https://www.afdb.org/en/search/content/climate%20finance%20tracking?title=climate+finance+tracking+guidance&type_1=All

5.4 Capacity Building Needs

Opportunities for overcoming the challenges and gaps for identifying capacity building needs should include improving country readiness, which includes costing of climate actions and formulation of bankable projects, as well as monitoring and evaluation of projects progress. Capacity building is needed to develop ability to access and deliver finance involving the use and mixing of financial solutions, which are currently not comprehensive or systematic.

The analysis of reviewed reports also revealed that capacity building is needed to improve the estimation of costs for adaptation and loss and damage. Considering that most countries have national institutions responsible for climate change, capacity building needs for raising awareness on availability and use of tools such as vulnerability and readiness assessment indices can support detailed identification of needs. In addition, capacity building for developing and implementing Measuring, Reporting and Verification (MRV) systems for estimations of costs can also improve the needs identification process.

Public finance management is a key area for capacity building. However, considerations of climate financing are not explicit. Therefore, capacity building ought to include national level MRV of climate financing, which would include both public and private financing.

6 CONCLUSION

Bank documents were reviewed to identify needs, analyze associated methodologies and underlying assumptions, gaps in determined needs (e.g. due to methodological and/or process related challenges), and opportunities to increase climate financing to support implementation of PA in African countries.

The review of Bank documents revealed that actual needs for the implementation of PA in African countries can be categorized according to 5 thematic areas: technical/technological, adaptation, mitigation, climate finance environment, and capacity building. Quantitatively, actual needs for African were estimated for the time frame of 2020-2030. It should be noted that the determined needs are based on the available data reported in AfDB documents, and should not be considered conclusive or exhaustive of actual needs.

Needs

Technical and technological needs consisting of feasibility studies and technical assistance in the energy, transport (includes roads, air, rail, ports), AFOLU, industry, cross-cutting social, and ICT, determined from regional integration strategy documents amount to $0.69 billion. No other values were reported in reviewed documents.

The total adaptation costs for African countries are projected around $7.4billion/year in 2020. The annual adaptation needs will increase 6 to 10 times the annual cost in 2020 to reach $44 to $74 billion in 2030. Therefore, the cumulative costs of adaptation in Africa between 2020-2030 may be in the range of $259 billion to $407 billion. Assuming the same commitment level for fulfilling costs in 2020, 64% of total costs will need to be mobilized from international sources. Therefore, adaptation financing gap in Africa may be in the range of $169 billion to $260 billion between 2020-2030.

As for sectoral adaptation needs, Africa NDC Hub's Analysis of Adaptation Components in African NDCs report estimated the projected annual adaptation needs for the five top priority sectors (Agriculture, water and sanitation, health, energy, and biodiversity and ecosystems) at $12.5 billion to $15.8 billion between 2020 and 2030.

Based on the global estimated cost of emissions reduction of $100/ tCO_2eq, the total mitigation Costs needed between 2020-2030 to meet conditional NDC commitments amount to $715 billion.

With respect to regional mitigation, needs were determined based on infrastructural projects in Indicative Operational Programs (IOPs) in the energy and transport sectors. Regional mitigation needs in the AFOLU and Water and Sanitation sectors based on IOPs could not be explicitly classified as mitigation. Needs in the energy and transport sectors are estimated to be $7.23 billion and $4.67 billion, respectively for 2020-2030. Energy projects explicitly relevant to mitigation consisted of solar power parks, a biogas village, and hydropower plants amounting to $7.07 billion and transmission lines associated with clean energy sources amounting to $0.16 billion for 2020-2030.

With respect to continental mitigation needs, the continental infrastructural financing gap extrapolated for 2020-2030 is $1300–$1800 billion. , The extrapolated estimated gaps amount to $350-500 billion for energy, $350-470 billion for transport/road, $560-660 billion for WSS and $40-70 billion for Information and Communication Technology.

In regards to Loss and Damage, the projected loss and damage costs for the 5 African regions (Norther, Southern, Eastern Western, and Central) covering the period 2020-2030 amount to $440.5 billion in the high warming scenario (more than 4 degrees increase in global average temperature), and $289.2 billion in the low warming scenario (less than 2 degrees increase in global average temperature). The needs were estimated based only on the data available in the AfDB documents.

Qualitatively, climate finance enabling environment needs were determined based on statements in documents for the need of financing. The review of Bank documents reveals an emphasis on increasing co-financing needs and private sector engagement by developing new instrument to promote private sector engagement including Risk-sharing instruments, by increasing bankability of projects, and aligning climate change in infrastructural projects. These needs must be estimated with consideration to Africa's increasing debt levels, which can adversely affect the efficiency of the proposed new instruments, and add further costs related to sustainable debt management.

Capacity Building, institutional strengthening/policy reforms needs are reported qualitatively based on statements in documents for the need to strengthen institutions and capacities.

Needs for Monitoring, Reporting, and Verification of progress on climate change were also identified. Rough estimates were determined as the difference between the total costs needed for fulfilling the MRV requirements as per the PA, and the support received by some African countries. Based on average costs referenced from GEF and AfDB documents, MRV needs by 2030 were estimated at $258 million for reports preparation support, $26.5 to 93 million for MRV capacity building. An example of the infrastructure needs for MRV system implementation in the electricity sector in one African country showed a need of approximately 1 Million $.

Methodologies and underlying assumptions

The main methodologies used to identify needs depend on the type of document reviewed. For regional strategies, technical and technological, adaptation, and mitigation needs are based on costs of projects constituting Indicative Operational Programs. The methodologies used to determine priority projects consist of lessons learned, consultations, and studies and assessments. Assessments defining the Bank's selection and prioritization tool pertain to alignment with other continental and national priorities and financial commitments of host countries among other.

Common underlying assumptions used for the determination of needs from project constituting indicative operational programs were based on socio-economic development indicators and physical parameters. Indicators include access to services such as electricity access rates% and clean water supply, time to reach destination via new or upgraded networks (road, marine, air), infrastructure index used in models for investment needs, and % contribution to GDP. Physical parameters include newly created or upgraded roads (km) and energy capacity (MW).

The adaptation costs were derived from the projections and estimations made by the Africa NDC Hub and referenced from UNEP's Adaptation Gap Report 2016 and Africa's Adaptation Gap Technical Report 2017. These projections were determined by estimating the adaptation gap, which is the difference between the projected adaptation costs in 2030 and the international climate financing projected to be available for the same year.

As for sectoral adaptation costs, they were derived from the estimations made by the Africa NDC Hub Analysis of Adaptation Components in African NDCs which provided adaptation costs for the top five priority sectors in 2020 identified from 28 analyzed NDCs. Projections for 2030 were made based on projected increase in adaptation costs of 6 to 10 times, and 64% international finance mobilization needs.

Mitigation costs were derived from conditional and unconditional commitments made by African NDCs for the year 2030 as estimated by Africa NDC Hub's Gap Analysis Report using a projected reference baseline emissions level for 2030 and the reduction potential of both conditional and unconditional commitments.

Loss and damage costs were identified for each Region as % of GDP in 2050 for high global warming scenario (average temperature exceeds 4 degrees), and low where global (average temperature is maintained below 2 degrees) as indicated in the AfDB report on Climate Change Impacts on Africa's Economic Growth. GDP and growth rate projections were referenced from the AfDB's 2020 Economic Outlook.

Finance enabling environment needs were determined qualitatively based on statements for co-financing and increasing private sector engagement needs. Underlying assumptions consist of insufficient secured funding from co-financier (explaining the recurrent mentioning of the Bank's efforts to mobilize additional resources) and of insufficient contribution/financing of projects by the private sector.

Gaps

Gaps in needs determined across the thematic areas were identified. With respect to adaptation needs determined, half of countries did not report adaptation costs resulting in an underestimated value. Reasons include complexity in estimating adaptation costs.

With respect to mitigation needs determined, the total investment requirement of $130-170b for 2016-2025 were extrapolated for 2020-2030 resulting in $1300-1700 billion. The sectoral breakdown consists of power investment: $350-500 billion, transport (air, rail,

port)/road sector at $350-470 billion, ICT at $40-70 billion, and WSS at $560-660 billion.. Energy needs derived from infrastructural investment requirement were estimated at 350-500 billion, which is comparable in order of magnitude to energy needs reported in the Power Africa report estimated to be $420-670 billion, but smaller. The variability may be methodological issues such as different modeling systems. Another point on mitigation needs in the energy and transport, estimates from IOPs are two orders of magnitude smaller than continental needs derived from the infrastructural gap. The discrepancy can be associated to the methodologies used to determine each estimate. In the case of regional projects, Indicative Operational Programs present projects following a screening process, which includes project readiness and national commitments among others. Therefore, these estimates do not provide an account of all required projects, and hence associated needs are not reflected in the Indicative Operational Programs. Furthermore, other factors contributing to underestimated values include incomplete determination of costs of projects, unavailability of a finalized projects list for North Africa, and unavailability of recent estimates for the Southern Africa region. For these reason costs derived from regional strategies are underestimated.

With respect to finance enabling environment, needs consist of increasing mobilization of resources in addition to AfDB's commitments and private sector engagement. Additional costs related to sustainable debt management must be estimated and included in the total needs, in order to account for the adverse impacts of the increasing debt levels of African countries on the enabling climate finance environment.

Opportunities

Opportunities to increase climate finance were identified. Though regional needs based on Indicative Operational Programs (IOPs) may present an underestimated value, aligning Indicative Operational Programs/Indicative Lending Programs with climate change may present opportunities for climate finance, which can relieve the pressure on the Bank's commitments. Regional Integration Strategy Papers (RISPs) do not consistently report on climate change links despite projects being implemented in key sectors causing and/or affected by climate change (mitigation and adaptation). The case of Western Africa-Regional Integration Strategy Papers can serve as an example for mainstreaming climate change in Indicative Lending Programs, where projects are classified according to relevance to climate vulnerability and/or mitigation and a ranking for ability to attract climate finance. Furthermore, linking with gender, education, and health can also open a channel for inclusive growth and green jobs creation.

Enhancing quality of project proposal preparation can also increase number of bankable projects and attract investment. Also, developing risk sharing instruments can encourage private sector engagement in high risk investment sectors such as agriculture.

Increasing contribution of manufacturing sector to GDP and for intra-regional trade is also another goal mentioned in strategies. The manufacturing sector presents green growth opportunities in terms of efficient technologies and cross-sectoral co-benefits such as

generation of green jobs contributing to youth unemployment reduction and gender inclusiveness.

Opportunities also exist for green growth and inclusive growth in agriculture sector as agriculture constitutes only 25% of the African GDP while women constitute 50% of employed- Feed Africa.

Overall, financing needs deduced from reviewed documents are likely underestimating the actual needs of African countries mainly due to underestimated costs of RISPS, unreported adaptation costs for half of the African countries, ambiguity over climate-proofed infrastructural projects, inconsistent needs reported on technical needs for preparation of projects and increasing bankability, costs related to promoting private sector engagement via risk sharing instruments.

Threats

Insufficient mobilizing of resources can increase pressure on domestic resources such as increasing tax to use revenues in implementing mitigation and adaptation projects, shifting resource allocation 2-3% of annual GDP and fuel and electricity subsidy removal, which can shift the burden to an already impoverished continent.

ANNEXES

Annex 1 - Description of Sources of Information for Determination of Needs

Regional Integration Strategies

As developing countries, which include Least Developed Countries, a generalized/common key objective is socio-economic development to fulfill basic needs: reducing poverty (e.g., through sustainable employment, creation of value-added products), food security, access to services, economic growth etc., which define the common regional context. One of the approaches to addressing those challenges is by fostering regional integration implemented via 2-3 pillars consisting of hard interventions infrastructure development in four main sectors Energy, Transport, Water Supply and Sanitation (WSS), Information and Communication Technology (ICT), and soft interventions consisting of Capacity Building (CB), Institutional strengthening, reforms in aforementioned sectors and financial/market/trade-related interventions.

Therefore, for Africa, addressing NDC and PA successfully is dependent on 'clean' processes and interventions for infrastructural development, which constitutes key priority areas for achieving socio-economic development goals and targets outlined in regional integration strategies. In other words, practically adequate climate action depends on clean infrastructure and adoption of smart practices in vulnerable sectors (affecting food security, and other core goals for the continent). In this context, regional integration strategies were reviewed to determine needs with implications on successful implementation of climate change actions.

Three types of reports were reviewed: framework (RISF), policy and strategy (RIPoS), Regional Strategy papers by region (RISPs), which are operational documents for the implementation of RIPoS.

Definition of Needs from Integration Strategies- The implementation of RISPs is operationalized by Indicative Operational Programs (IOPs)s/Indicative Lending Programs (ILPs), which consist of operations (projects and programs) that will reduce challenges to achieving RI and translate into infrastructural projects, institutional reforms/policies/CB etc.

RIPoS is blueprint for Africa's long term strategy for RI and is implemented by RISPs for the 3 regions (Central, Eastern, North, Western and *Southern Africa-pending update*) and CSPs. RISPs describe operational priorities, which are broadly classified to fulfill 3 pillars: 1) infrastructural development, 2) capacity building/institutional strengthening and 3) reforms, and financial integration/promotion of intra-African trade.

Needs from RI Strategy documents were determined by:

- Identifying explicitly reported financing needs (infrastructure gap/deficit estimates)
- Estimating financing resource requirements of Indicative Operational/Lending Programs (IOPs/ILPs) on the basis of co-financing, private sector engagement requirements

At the Center of Africa's Transformation Strategy - Ten Year Strategy (2013-2022)

The Center of Africa's Transformation Strategy, the Bank's Ten-year Strategy (TYS) shows how the AfDB (hereon referred to as the 'Bank') can bolster Africa in its transformation to be a "stable, integrated and prosperous continent".

At the Center of Africa's Transformation Strategy - Ten Year Strategy (2013-2022)

The strategy has dual objectives: inclusive growth and green growth through five pillars:

1. Infrastructure development,
2. Regional integration,
3. Private sector development,
4. Governance and accountability
5. Skills and technology.

Three special areas are emphasized and touch upon thematic areas and sectors relevant to determining needs for climate change action:

1. Fragile and conflict-affected states,
2. Agriculture and food security,
3. Gender

The strategy underlines the need for bankable infrastructure projects as well as soft infrastructure and enabling environment including policy and regulatory reforms, training and building capacities of officials. Sectoral challenges identified include:

- **Water and sanitation:** gap in water and sanitation infrastructure weighs 5% of Africa's GDP
- **Transport:** high transport costs increase the price of African goods by 75%
- **Energy:** 30 countries suffer from recurrent power outages.
- **AFOLU:** is a key sector in Africa that is highly vulnerable to climatic changes and needs infrastructure in rural roads, storage facilities, irrigation and markets– food insecurity and high importing rates of food – low value of raw agricultural products
- **Social**: lack of skills needed for youth to compete in employment markets – Gender inequalities in the majority of the African countries.
- **Trade:** lack of regional integration to connect people and expand trade opportunities across the continent.
- **Finance**: Low private sector engagement - nascent financial sector that is not fully developed with problems of volatility, scale, long-term liquidity and unfavorable

risk perception from international counterparts - public financial management, which is a key hurdle for many RMCs (p.18).

- **Institutional/Capacity building:** lack of conducive policies and enabling environment for involvement of the private sector
- **Political:** fragility and lack of stability in some states, which results in higher vulnerability in these countries.

Document	Financial Requirements	Thematic Area	Notes
TYS (2013 – 2022)	$100 billion/year	Inf. Dev.	Breakdown of types of infrastructure not specified
Total = 100*10 = **$1 trillion**			

Thematic Area

The twin objectives of the strategy have strong implications on addressing climate change through the five pillars of the strategy. The objective of green growth will result in less greenhouse gas emissions (**Mitigation**) and increasing the resilience of systems (**Adaptation**). Moreover, inclusive growth will reinforce the capacity of communities and individuals to adapt to climate change, specifically youth, women and other marginalized and vulnerable groups (**Adaptation**).

Scope: The TYS is a long-term strategy (10 years) that reflects the African continent's vision to transform. It focuses particularly on the AfDB role in conducing to this transformation.

Financial needs: *The financing scheme emphasizes the need for* innovation in existing windows (leveraging all instruments), mobilization of continent's own resources, climate finance, emerging economies, co-financing, sovereign wealth and pension funds, social and philanthropic investors, leveraging Bank capital and new instruments [e.g. more PPP, risk mitigation instruments (e.g. guarantees)].

Initiatives between AfDB and other MDBs

The desired growth in Africa will be led by the private sector in partnership with the public sector.

Partnerships with development institutions, e.g., the European Union and the World Bank, as well as key bilateral development agencies in Africa.

Other Partnerships: African Union, the secretariat of the New Partnership's for Africa's Development, African Energy Ministries, Economic Community of West African States, the African Ministerial Council on Water, the African Bond Market Initiative, the African Investment Climate Facility, the African Peer Review Mechanism and the Collaborative Africa Budget Reform Initiative, the African Organization of Supreme Audit Institutions, the Africa Regional Technical Assistance Centers and the African Tax Administration Forum, United Nations Economic Commission for Africa, Global Environment Fund

(GEF), Green Climate Fund (GCF), Climate Investment Fund (CIF), the Bank's Sustainable Energy Fund (SEF), African Water Facility (AWF), the Social Business Fund, the Rural Water Supply and Sanitation Initiative, the Multi-Donor Water Partnership Program and the NEPAD Infrastructure Project Preparation Facility.

Co-financing arrangements between AfDB and other strategic partners, e.g.: India, France, Japan, Korea and the Islamic Development Bank.

High 5 Documents

Despite being rich in natural resources much of the continent is characterized by poverty, energy insecurity, low electrification rates, food insecurity, climate change vulnerability, low intra-regional trade, youth unemployment etc. In this context, the High 5s reports define priority areas for development and requiring support. Priority areas consist of: universal access to energy, agricultural transformation, economic diversification, regional market, and access to socio-economic The High 5s are in alignment with the TYS, UN Sustainable Development Goals (SDGs), and goals of COP 21. **Error! Reference source not found.** shows the High 5 priority areas and their targets:

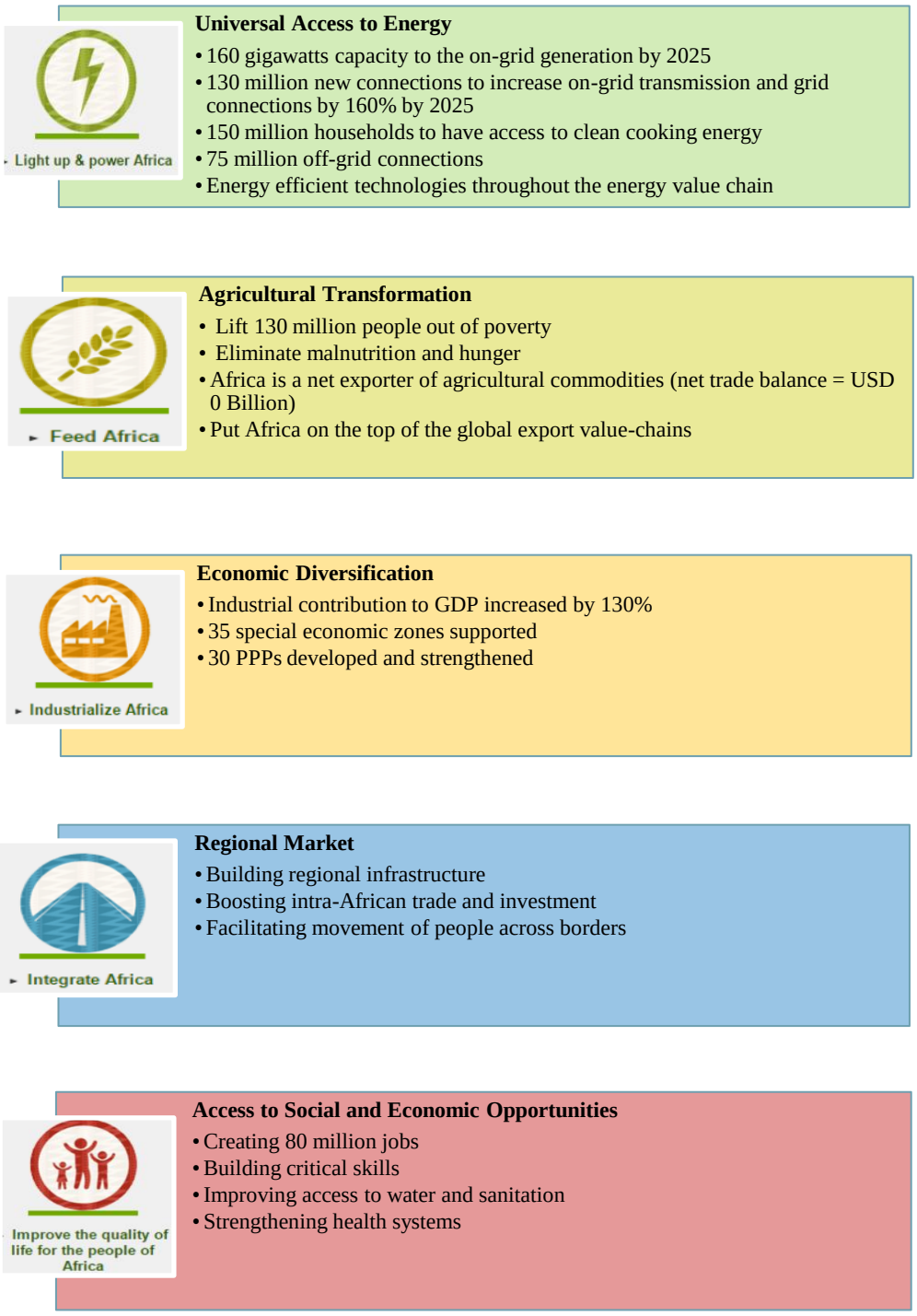

Figure 6-1: The High 5s and their targets

Development needs in the High 5 priority areas are related to climate change mitigation and adaptation. For example, with respect to adaptation and resilience, agricultural transformation can enhance resilience to CC impacts, (e.g., variability in precipitation due to CC affects rain-fed agricultural practices). On the mitigation front, adopting cleaner technologies in infrastructural development (e.g., electricity generation, efficient transport

etc.) can help reduce greenhouse gas (GHG) emissions, while achieving socio-economic development goals. The High 5 documents were reviewed to identify climate needs interrelated to the five priority areas.

Light up and power Africa – The New Deal Strategy on Energy for Africa 2016-2025

The access to reliable, affordable, and sustainable energy is crucial for Africa's economic and social growth and transformation. Accordingly, the main objective of this strategy is to provide "universal access" to energy to over 645 million people in Africa (around 40% of the continent's population) by 2025, which means reaching 95% in rural areas and 100% in urban areas through both off-grid and on-grid options. The meaning of universal access to energy by 2025 is to connect 205 million households and to roughly grow the grid generation capacity twofold to accommodate the rapid increase of Africa's population, the households' number and the GDP.

In this context, the Transformative Partnership on Energy for Africa was launched in the World Economic Forum to be a platform for PPPs to support the energy sector in Africa with innovative financing.

The goal of providing energy to over 645 million Africans will be achieved through five targets as illustrated in Figure 6-1:

1. Adding 160 gigawatts capacity to the on-grid generation by 2025
2. Adding 130 million new connections to increase on-grid transmission and grid connections by 160% by 2025
3. Providing access to clean cooking energy to 150 million households
4. Expanding the off-grid production by adding 75 million connections by 2025, which is twentyfold the current generation in Africa
5. Energy efficient technologies throughout the energy value chain starting (i.e. generation, transmission, and distribution to end users)

The strategy works on seven strategic themes:

1. Establishing proper enabling policy environment
2. Supporting utility companies by improving operations, restructuring, and providing technical assistance and **capacity building**
3. Enlarging the number of bankable energy projects
4. Growing the **funding pool** needed for the delivery of new projects
5. Underpinning the "bottom of the pyramid" energy access programmes
6. Increasing significant regional projects and boosting integration

Leading energy transformation on country level

The strategy underpins the implementation of other strategies and policies of the Bank, inter alia, the RIPoS (2014-2023), the Gender Strategy (2014-2018), the TYS, the Bank's Private Sector Development Strategy (2013-2017) and the Governance Strategic

Framework and Action Plan (2014-2018). The strategy also bolsters the achievement of the High 5s strategic goals of the Bank as well as the SDGs (SDG 7, 1, 13, 3, 5 & 10) and the goals of Paris Agreement and the African Countries NDCs (both **mitigation**: 40% reduction in emissions by 2030 against BAU and **adaptation** of the energy sector to consider the impacts of climate change). For instance, the transition to low carbon energy (renewable energy systems, more energy efficient appliances and technologies, utilization of clean cooking energy instead of wood and charcoal etc.) will support combating climate change and the global sustainability. In addition, it will increase the resilience of the communities. The New Deal will result in decoupling CO_2 emissions per unit of increase energy output by 2025.

The New Deal is underpinned by these five pillars:

1. Raise the ambitions for solving energy challenges in Africa through mobilization of financial resources and political will
2. Set up a Transformative Partnership on Energy for Africa
3. Mobilize and deploy local and international capital to innovatively finance the energy sector in Africa
4. Reinforce energy regulatory framework, policy and sector governance in African governments
5. Promote the AfDB's energy investments and climate finance
6. Financial needs

Document	Financial Requirements	Thematic Area	Sector	Notes
The New Deal Strategy & High 5 – Light up & power Africa (2016 – 2025)	$65 - 90 billion/year	Inf. Dev.	Energy	This number is for the infrastructure needed for the universal access to energy goal over the ten years period of the strategy.
African NDCs (25 countries)	$ 480 billion	Inf. Dev.	Energy	This number encompasses only the energy projects that are stated in 25 African NDCs (mitigation &/or adaptation).

Infrastructural investment for universal electricity access(Financing source breakdown of current investments of approximately $23 billion/year [11% Private sector, 33% National governments and 56% Multilateral Development Banks (MDBs)/Development Financial Institutions (DFIs)-power AFRICA)

There are three potential scenarios for financing the strategy:

- *Scenario 1:* increasing the current funding patterns proportionally, so that private sector would contribute $8 billion, the governments would have the share of $25 billion, and the MDBs/DFIs would invest around $ 40 billion annually.

- *Scenario 2:* failure to attract the private sector and in this case governmental investments need to reach $ 48 billion per year, which is 6.5 the current rate through taxes, subsidy removal and GDP. Whereas, MDB/DFI financing would be double the present figures at least.
- *Scenario 3:* enhancing the enabling environment to attract private sector investments anticipating that the private sector share would grow seventeen folds the current number (from $2.5 billion to $ 43 billion) and assuming that the MDB/FDIs contribution would double. However, achieving this would depend on the public sector capacity to provide a stable and well-developed regulations to attract more investments.

Feed Africa Strategy (FAS) for agricultural transformation in Africa 2016-2025

The overarching goal of Feed Africa Strategy is to multiply the gains of the agriculture sector and lead it towards a sustainable transformation for all lives with the inclusion of the most vulnerable and poorest population in Africa.

About 60% of Africans live in rural areas and earn their livelihood from agriculture. Additionally, women comprise around 50% of the agricultural labor force in Africa. Despite this, the agriculture constitutes only 25% of the African GDP.

Climate change is a key driver for the agricultural sector transformation. Feed Africa Strategy is explicitly concerned with the disproportionate impacts of the climate variability and risks due to the high vulnerability of the continent to its repercussions particularly the agricultural sector and the Sahel area. This has resulted in the increase of food insecurity in many countries in Southern and East Africa. Therefore, the adoption, promotion and financing of climate-smart agriculture (CSA) is indispensable.

The strategy is in alignment with the vision of the 2063 strategy for Africa that aims to "consolidate the modernization of African agriculture and agro-business", the dual objectives of the AfDB TYS (i.e. inclusive growth and green growth), and COP 21 commitments. In light of this, it will support countries to fulfill the agricultural sector commitments in their NDCs.

This strategy has evolved alongside the other "High 5s" (i.e. light up and power Africa, industrialize Africa, integrate Africa and jobs for youth in Africa) to ensure the harmonization of their objectives and the avoidance of investments duplication.

Thematic Area

Adaptation: increasing food security, promoting **youth and women** engagement; and promoting **resilience** against climatic changes and their adverse impacts.

Mitigation: using low carbon technologies, agroforestry, restoring degraded land and forest plantation.

Capacity building and Institutional Arrangements: reinforcing the **capacity** of **governments and multilateral institutions**, **among others** to underpin this transformation

Scope

Feed Africa Strategy is a long term continental (10 years) strategy. However, the targets are to be achieved on country level.

Financial needs

The transformation of 18 selected value chains is valued at **$315-400 billion** throughout 2015-2025 **($31.5-40 billion per annum**). However, full transformation of the agriculture sector is estimated to cost around **$1.8 trillion** over ten years.

Document	Financial Requirements	Thematic Area	Sector	Scope	Notes
High 5 – Feed Africa (2016 – 2025)	$315-400 billion **$31.5-40 billion per annum**	Inf. Dev.	Agri.	18 value chains	This number includes six enablers: value chain development (production & value added); soft and hard infrastructure; agriculture finance; enabling environment; inclusivity, sustainability & nutrition; and Agricultural Transformation Agenda (ATA) for Africa.
	$1.8 trillion	Inf. Dev.		Full transformation of the sector over ten years	-

Financial resources

AfDB, multilateral and bilateral, public and private sector investments will fund roughly **$9 billion** of transformation of the priority agricultural commodities, hence the gap will be **$23-31 billion per year**.

The African Development Bank envisages to raise its investments in agricultural and agribusiness from $612 million in 2011-2015 to **$2.4 billion per year** henceforth.

The Bank will fund FAS through African Development Fund (ADF) and African Development Bank (ADB) funds and other existing funds at the Bank, Nigeria Trust Fund, private sector, bilateral donors, foundations and DFIs funds that target the ATA.

Initiatives between the African Development Bank and other MDBs

There are several partnerships that will help achieve the agricultural sector transformation. Figure 6-2 depicts the high level setup of partnership for agricultural transformation in Africa.

Figure 6-2: High level setup of partnership for agricultural transformation in Africa - Source: FAS

Integrate Africa

The key objective of Integrate Africa Strategy is to reinforce all aspects of connectivity in Africa to facilitate the achievement of a common single market through initiatives in ICT, power generation, transport infrastructure, investment and trade, in addition to financial market integration and inclusion.

The five key priorities of Integrating Africa will help the continent adapt to climate change impacts, i.e.:

1. Expanding markets and prepare them to attract more investors
2. Connecting landlocked countries with other regional and global markets
3. Boosting regional trade and investment in Africa
4. Promoting private investments and the know-how through the improvement of business environment
5. Reaping the benefits from the free movement of people, cultures, information and ideas.

Thematic Area

Adaptation: Infrastructure for electricity access including renewable energy projects (**Mitigation co-benefits**); sustainable water resources management projects; expansion of rail, roads, ports and air links; telecommunications infrastructure to improve logistics and information flows; strengthen the business environment for regional, continental and global

trade; enhancement and liberation of capital flows all over Africa to promote investments (all these areas can support **adaptation to climate change**)

Capacity building and Institutional Arrangements: integrating Africa supports concerted regulations, policies, laws, intact governance, robust institutions and an enabling business environment that encourages private sector investments across borders.

Scope

Integrate Africa is a long term continental (10 years) strategy.

Financial needs

Industrialize Africa

The industrialization of Africa is necessary to achieve inclusive and sustainable growth. The strategy focuses on six leading programmes, which are:

1. Promoting effective industrial policies
2. Fostering strategic partnerships in Africa
3. Increasing liquid and effective capital markets
4. Encouraging and driving development of enterprises
5. Bolstering the development of industrial clusters across Africa
6. Attracting and directing funds for industry and infrastructure projects

Thematic Area

Industrialization provides opportunities for **mitigation** projects from a technological standpoint, e.g., use energy efficient technology, renewable energy, etc. and inclusive growth and green growth, (e.g., job creation to vulnerable and marginalized population.)

Scope

Industrialize Africa is a long term continental (10 years) strategy.

Financial needs

Initiatives and Partnerships

AfDB makes partnerships with other significant stakeholders such as **UNIDO** to expedite Industrialize Africa and to cooperate on joint activities in areas, inter alia, eco-industrial parks; enterprise development; access to finance; innovation and technology investments; circular economy; and agro-industry development.

Improve the quality of life for the people of Africa

Improve quality of life for the people of Africa aims at alleviating poverty, social exclusion and inequality. This will take place by harnessing the capabilities of 1 billion Africans through developing skills and boosting technologies to create better jobs. AfDB will achieve this via different programmes and projects that focus on employment, youth entrepreneurship, education, health, water and sanitation, nutrition and skills development.

The focus is on two enablers, i.e. inclusive social and financial systems and inclusive growth as the rate of informal work in Africa is predominant, especially among women.

Thematic Area

All programmes and projects under this priority area will promote the resilience and **adaptation** of communities against climate change impacts.

Scope

Improve the quality of life for the people of Africa is a long term continental (10 years) strategy.

Financial needs

It is estimated that about **$13 billion is needed annually** to fulfill the SDG target of universal access to water supply and sanitation.

Document	Financial Requirements	Thematic Area	Sector
High 5 - Improve the quality of life for the people of Africa	$13 billion	Inf. Dev.	Water supply and sanitation

Initiatives and Partnerships include collaboration with multinational organizations such as Safaricom, Rockefeller, Facebook, and Microsoft to train youth and women on ICT skills. Moreover, AfDB is partnering with the African Institute of Mathematics and Sciences to establish an industry-led research institution in Africa.

Partnership with Ford Foundation to train around 100 SMEs for better business linkages for youth and women who work in the oil and gas sector in Kenya and Uganda.

Additionally, AfDB strives to render the agriculture sector more attractive to youth and to support young entrepreneurs in the agriculture sector.

Jobs for Youth in Africa – Strategy for creating 25 million jobs and equipping 50 million youth 2016-2025

The youth population in Africa is anticipated to reach over 830 million by 2050. However, this can foster the inclusive economic growth across Africa and increase productivity if properly leveraged.

The strategy's main objective is to create about 25 million jobs for youth and to equip them with the necessary skills having positive impacts on 50 million youth over the next decade to address the gap since only 3 million formal jobs are provided every year, whilst 10-12 million youth join the workforce annually.

The strategy will achieve this through promoting entrepreneurship, inclusive employment, enhancing human capital, and developing strong labor market by intervening in three strategic aspects, which are innovation, investment and integration.

The Bank will integrate youth employment in all projects, systems and staff, and support RMCs technically and financially to set plans and policies that lead to better outcomes. Focusing on innovation, the Bank will adopt, implement, evaluate and scale up solutions that have high potential. The initial focus will be the Bank's high priority sectors, i.e. industry, agriculture, and ICT). In addition, the Bank will spur private sector investments and entrepreneurship that stimulate creation of jobs and youth employment.

The strategy will drive towards the achievement of SDG8 (inclusive growth, productive employment and decent work for all), SDG4 (equitable education and skills development) and SDG1 (ending poverty).

Youth employment will be incorporated in the CSPs and RISPs to guarantee that Jobs for Youth in Africa is considered in country level programmes.

Thematic Area

Creating jobs for youth and improving their lives, while supporting other priority areas with **adaptation** and **mitigation** co-benefits such as agriculture, energy, regional integration, and industrialization.

Adaptation: the strategy particularly targets youth in fragile states and post-conflict zones, which are among the most affected population by climate change impacts. In addition, it sheds the light on the reduction of gender inequality in the labor market.

Scope

Jobs for Youth in Africa (JYA) is a long-term continental (10 years) strategy.

Sectors: Flagship programmes in priority sectors, i.e. ICT, industry and agriculture

Financial needs

The Bank's target **in 2030 is to reach $1.4 billion additional financing** made available to businesses through investment activities (Annex 1)

The Bank needs to pool UA 350 million (= **$483 million**, since 1 UA = $1.38) annually for the implementation of the JYA strategy between 2016 and 2025.

Financial resources

Activities will be financed by three funding sources, which are the Jobs for Youth in Africa Facility, cost sharing for flagship programmes and other sources of funding (the Bank will pool resources from other private, public, and philanthropic organizations).

Jobs for Youth in Africa Facility is a special fund that will pool resources from the Bank and similar donors and focus on youth employment.

Initiatives and partnerships

The Bank will be keen to establish long-term partnerships with actors and other initiatives that address unemployment. The four areas of collaboration are: knowledge and incubation, programmatic design and implementation, job linkages and funding. Private sector is a key player with nine out of 10 jobs offered by the private sector.

Complementary initiatives such as: S4YE, ILO and Let's work.

AfDB Strategy for Addressing Fragility and Building Resilience in Africa (AFBRA) 2014-2019

Addressing Fragility and Building Resilience in Africa (AFBRA) 2014-2019' and 'Operational Guidelines for the Implementation of the Strategy for Addressing Fragility and Building Resilience in Africa and for the Transition Support Facility ORTS – 2014'

Two reports address impact of fragility status of African countries. The fragile state of several countries in Africa can result in specific impediment to development and climate change action such as building resilience. The AFBRA was reviewed to identify needs of fragile states.

The focus of the AFBRA is on the main access points that would assist in managing the major drivers for fragility and building more resilient states since fragility is a major challenge for Africa's development.

The Bank will particularly focus its involvement on three strategic areas, which are: 1. build and enhance capacity of the state and provide support to effective institutions; 2. encourage building more resilient societies via impartial and inclusive access to essential services, employment, and shared benefits of natural resources wealth, and 3. boost the Bank's roles in profound policy dialogues, partnerships and advocacy to solve fragility issues.

Thematic Area

The AFBRA will depend on the following: 1. Impartial access to basic infrastructure, 2. Promotion of private sector involvement to lead employment and livelihoods, 3. Social inclusion, 4. Fostering responsible natural resources management and 5. Gender equality. The implementation of this strategy will be accompanied by **adaptation** benefits especially that it addresses fragile communities and systems, which are more susceptible to climate

change impacts. It might also have some **Mitigation** co-benefits due to carrying out sustainable natural resources management and green infrastructure systems.

Scope

This strategy is a medium-term (5 years) continental strategy.

Financial Needs: No information on the financial needs reported in the strategy

Financial Resources

All the Bank's instruments will back this strategy based on the context of each case. The Bank's finance will be through the ADF, ADB, NTF, FSF and other facilities and trust funds.

New instruments entail: Africa50 Infrastructure Fund, the Partial Risk Guarantee (PRG), the Partial Credit Guarantee (PCG) and the Private Sector Credit Enhancement Facility (PSF).

Initiatives and partnerships

Partnerships and different stakeholders, inter alia: the African Union, Regional Economic Communities (RECs), UNECA, development partners, African governments, CSOs and the private sector, Bretton Woods Institutions, the EU, bilateral partners, UN agencies, OECD-INCAF and G7+.

Initiatives, e.g.: the New Deal for Engagement in Fragile States, the African Solidarity Initiative, the International Conference on the Great Lakes Region (ICGLR), the Intergovernmental Authority on Development (IGAD), and other African peer learning initiatives.

Operational Guidelines for the Implementation of the Strategy for Addressing Fragility and Building Resilience in Africa and for the Transition Support Facility ORTS - 2014

This document provides guidelines for the implementation of the AFBRA strategy (2014-2019). It gives further elaboration on the different categories of fragile states, methodology to assess fragility, the Bank's Transition Support Facility (TSF) (previously Fragile States Facility (FSF)), risk assessment and management in fragile situations and states, and monitoring and evaluation and results framework for the implementation of the strategy.

The three pillars that FSF will provide resources for are: 1. Enhance performance-based allocations (PBA), 2. Clear arrears, and 3. Meet the vital needs for capacity building, targeted assistance knowledge and service delivery

Financial Resources and Instruments

AfDB will use all its resources and financial instruments, mobilize internal and external resources, promote private investments in fragile states and pipeline of operations in fragile states, program-based operations, effective partnerships and multi-donor trust funds (MDTFs) to address fragility.

The financing instruments from both the AfDB's Group non-statutory (i.e. bilateral and thematic trust funds, dedicated facilities and special funds) and statutory (i.e. ADF, NTF and ADB) financing windows will be available to low-income RMCs including grants, guarantee instruments**,** sovereign equity participations, lines of credit, **capacity building, technical assistance,** project preparation grants, and project and programme loans.

The sources of funds for the TSF are the Bank, the fund, other donors and beneficiary countries (in case of the arrears clearance).

6.1.8. 'November 2013 - Progress report on the implementation of the CCAP 2011–2015' and 'AfDB Group's Second CCAP 2016 – 2020'

The African Development Bank has developed two Climate Change Action Plans (CCAP) for Africa; the first CCAP cover 2011-2015 and the second 2016-2020. The Bank prepared a progress report on the status of implementation of the 1st CCAP (2013), which includes challenges.

6.1.9. November 2013 - Progress report on the implementation of the Climate Change Action Plan (CCAP) 2011–2015

This report presents updates on the implementation of the CCAP, which is based on three pillars: 1. Adaptation climate resilient development and building adaptive capacity, 2. Low-carbon development, and 3. climate financing platform.

The report stated that the existing investments in adaptation fall behind the planned targets in CCAP 2011-2015. The majority of projects in the CCAP pertain to infrastructure development in energy and transport.

Total investments for adaptation and mitigation projects implemented between 2011 and 2012 amounted to $17.75 billion. The Bank contributed $4.30 billion about 45% of the target investment of $9.6 billion for the implementation of the CCCAP 2011-2015.

Thematic Area

Adaptation: **Agriculture**: increasing agricultural productivity and sustainability and food security, boosting incomes in rural areas, **Forests**: foster engagement of community and raise knowledge on sustainable forest management, **Water**: enhancing water resources supply, clean water resources and irrigation systems.

Mitigation: **Energy**: clean renewable energy, energy efficiency, **Transport**: sustainable transport and **AFOLU**: sustainable land use systems.

Some issues are **cross-cutting** among the three pillars of the CCAP, such as: **capacity building, communication and awareness, institutional and policy reforms, international cooperation and partnership, and knowledge**.

Financial Needs

Sectoral needs: The Bank has reinforced its partnership with other MDBs intending to invest **$175 billion** in sustainable transport throughout the next decade.

Document	Financial Requirements	Thematic Area	Sector	Notes
November 2013 - Progress report on the implementation of the Climate Change Action Plan (CCAP) 2011–2015	$175 billion	Inf. Dev.	Sustainable transport	The methodology for estimating this number is not provided. It is also not clear what it specifically includes

Scope

Timeframe of the first CCAP: medium term (4 years)**,** *Geographical Scope:* Continental

Financial Resources, Instruments, Initiatives and Partnerships

Partnerships: Adaptation Fund, Global Green Growth Institute, the Institute for Global Environmental Strategies, the Partnership for Action on Green Economy (PAGE – Africa), and Green Growth Knowledge Platform (GGKP).

Various climate change related initiatives and financing instruments are managed and hosted by the Bank such as: AWF, Climate for Development in Africa Special Funds, the Congo Basin Forrest Funds, Sustainable Energy Fund for Africa, and Rural Water Supply and Sanitation Initiative Trust Fund in addition to other bilateral and multilateral funding.

Furthermore, the Bank's access to the GEF and the CIFs resources has increased. However, there is still a need to attract private sector investments and international support to uphold Africa's development in a low-carbon climate resilient way.

A total of UA 724.2 million (~ $999.4) million from external financial resources (CIF, GEF and other funds) were approved and ready to be channeled through the Bank. Whereas, the amount of program-level commitments pledged by donors from the Bank-hosted initiatives is equivalent to UA 480.80 million (~ $663.5 million).

AfDB Group's Second Climate Change Action Plan (CCAP) 2016 – 2020

There is a considerable gap between financing mitigation and adaptation, therefore adaptation is a priority for the Bank in this CCAP. This CCAP aims to achieve a 50/50 financing goals between mitigation and adaptation.

The four pillars that overarch the activities of this action plan are: 1. Climate-resilient development, 2. Low-carbon development, 3. Mobilizing financial resources and 4. Enabling environment to address (cross-cutting) issues, inter alia, technology development and transfer, capacity building, partnerships and networks and policies and institutional reforms.

GCF Approved proposals

Considering similarities in socio-economic, environmental/CC features between countries within a specific region, successful project proposals can help inform on needs of other countries. Approved funding proposals by GCF were reviewed to investigate needs with respect to types (e.g., sectoral, thematic area) and costs of activities, which can serve as basis to estimate similar needs in other countries. Five GCF proposals were reviewed:

Table 6-1: GCF Approved Funding Proposals Reviewed

GCCF Proposal	Region	Thematic Area	Sector
Program on Affirmative Finance Action for Women in Africa (AFAWA): Financing Climate Resilient Agricultural Practices in Ghana (2019)	Western Africa (WA)	Technological, Finance, Adaptation Social	Agricultural
Democratic Republic of Congo (DRC) Green Mini-Grid Program (2018)	Central Africa (CA)	Technological	Electricity
Yeleen Rural Electrification Project In Burkina Faso through a private sector driven Green Mini Grid model (2018)	WA	Technological Finance	Electricity
Programme for Integrated Development and Adaptation to Climate Change in the Niger Basin (PIDACC/NB) (2018)	WA	Adaptation	Infrastructure
Zambia Renewable Energy Financing Framework (2018)	Southern Africa (SA)	Mitigation, Finance	Electricity

Trust Funds Annual Report 2018

The Bank currently hosts total of 42 Funds under three types: thematic[48], Bi-lateral[49], and Other[50] Funds. The Bank manages 20 thematic trust funds, which constitute 70% of all trust funds. In addition to the thematic funds, the existing 16 Bi-lateral Funds makes up 12% of the total pool of funds, whereas the Bank also manages 6 Other Funds constituting 16%. There is an increase in the amount of mobilized funds each year from $1479 million (UA 1072 million) in 2018 compared to $1319 million (UA 956 million) in 2016. The Bank's Trust Funds received total cumulative contributions from donors estimated at UA 1.16

[48] Funds for specific sectors, regions or countries, or covering specific themes or topics (e.g., water, energy, etc.
[49] Established based on funding agreements between two countries/organizations (mostly developed country and an African country)
[50] All other funds that are not the above. Include bi and multilateral agreements between multiple countries, funds for multiple sectors, etc

billion ($1.6 billion) as of 2018. In 2018, $69.2 million was approved for 108 projects under the Trust Funds portfolio.

There are 10 Trust Funds related to addressing CC directly or indirectly as shown in Table 6-2. These funds serve mitigation, adaptation and resilience, and capacity strengthening financing, with emphasis on fragile states that are more vulnerable to the impacts of CC.

Table 6-2: Trust Fund operating under The Bank's auspices

Trust Funds related to CC	**Cumulative contributions Received from donors**
Thematic Funds	
ACCF	10.2m since 2014
African Water Facility	UA 137.7m since 2004
Agriculture Fast Track Fund	17m since 2013
ClimDev Africa Special Fund (CDSF)	UA 27.66
Congo Basin Forest Fund	NA in the report
Rural Water Supply and Sanitation Initiative (RWSSI)	NA in the report
Sustainable Energy Fund for Africa (SEFA)	74.4m since 2011
SFRD of the Great Lakes Region	NA in the report
"Other" Funds	
Infrastructure Consortium for Africa (ICA)	NA in the report
Global Strategy to Improve Agriculture and Rural Statistics (GARS)	NA in the report

Scope:

The report highlights some of the key highlights from the Trust Funds activities in 2018, focusing on addressing challenges related to 'soft infrastructure'. Programmes and projects funded by the Bank's Trust Funds as of 2018 are more focused on national, multinational and sub-regional scope than regional, and are developed for short-medium time-frames (3-5 years). Project portfolio of the Bank's Trust Funds are focused towards the more fragile states in Africa with poorer infrastructure.

Key sectors reported:

The focus of the Trust Fund supported projects is on **Infrastructure development** as a cross-cutting need for addressing CC mitigation, adaptation, and capacity building across different sectors including Energy(renewable and conventional), Water and sanitation, Agriculture, and transport. The report concludes that infrastructure is a core need to achieving progress on the SDGs, the high 5's, and the AU Agenda 2063, all being overarching frameworks for the Bank's operations.

The Top priority areas receiving funds from the thematic trust funds pool as of 2018 include:

1. Renewable energy infrastructure (31% of total TTF approved projects) **(Mitigation)**

2. Transport Infrastructure (airports, roads, etc) (22%) **(Mitigation and Adaptation)**
3. Water and sanitation infrastructure (18%) **(Adaptation)**
4. Private sector development (12%) **(Capacity building)**
5. Power infrastructure (5.5%) **(Mitigation)**
6. Social development (3.2%) **(Adaptation)**

Priority areas receiving funds from Bilateral Trust Funds pool:

1. Multisector (40% of total BTF approved projects) **(Mitigation and Adaptation)**
2. Agriculture (35%) **(Adaptation and resilience building)**
3. ICT (14%) **(Adaptation)**
4. Water (8%) **(Adaptation)**
5. Energy (2%) **(Mitigation)**
6. Governance (1%) **(Capacity Building)**

The number of approved climate finance projects only consistuted 0.52% of the total trust funds pool as of 2018.

Reported needs:

Quantified needs: The report suggests that high-quality infrastructure is essential for Africa to achieve the Sustainable Development Goals (SDGs). In the same report, the Bank acknowledges country needs for infrastructure development, particularly in fragile states with poorer infrastructure, and commits to investing further in infrastructure development in order to reduce a reported **infrastructure financing gap estimated between $70 billion and $100 billion per year**, and it is reported as the basis upon which funds mobilization targets are set.

The 2019-2021 Trust Funds Annual Allocation is $51 million, 55 million, and 58 million respectively. 40% of the needed resources were directly available for commitment in 2019, and expected to increase to 45% in 2020 and 45% in 2021**. This implies that almost half of the targeted funding to be mobilized is still unavailable or unallocated**

Document	Financial Requirements	Thematic Area	Notes
Trust Funds Annual report 2018	**$70 billion and $100 billion per year financing gap**	Infrastructure	it is reported as the basis upon which funds mobilization targets are set.
	$51 million, $55 million, and $58 million	2019-2020-2021 Trust Funds Allocation	40% of the needed resources were directly available for commitment in 2019, and expected to increase to 45% in 2020 and 45% in 2021**.**

Unquantified needs:

- The report identified clear needs for **project proposals development and preparation** and **capacity building,** as they remain major challenges requiring financial support besides infrastructure needs. Yet, the needs are not quantified.
- The Bank is also committed to climate-proof 100% of its investment portfolio (currently at 40% and targeting 100% by end of 2020).

Climate Change and Green Growth - 2018 Annual Report

The report presents the CC and Green Growth department's key highlights and achievements for its activities in 2018, and provides progress reporting on the implementation of the Bank's second climate action plan 2016-2020.

The Bank nearly achieved parity between adaptation (49%) and Mitigation finance (51%), a 19% increase compared to 2016. Mitigation investments reached $1.62 billion, Adaptation $1.6 billion and climate finance reaching $3.27 billion.

Scope

Similar to the scope of projects and programmes presented in the Trust Funds report, the focus of the presented example projects is on multi-national and national projects for immediate to medium term implementation (3-5 years). The project examples selected cover the Bank's High 5s.

Key sectors reported

The report highlights the progress on the implementation of the Bank's second climate action plan 2016-2020, which includes x pillars.

Pillar 1: Boosting adaptation and climate-resilient development: covering the 5 high5 priority areas

Pillar 2: promoting mitigation and low-carbon development: renewable energy and energy efficiency, climate-resilient agriculture, green infrastructure, and waste management.

Pillar 3: mobilizing resources to finance climate action: Implementing the Bank' ambitious target: 40% of all approvals accounted as climate finance by 2020; and 100% of all approvals based on climate/green growth-informed design. The share of climate finance in annual project approvals grew from just 9% in 2016 to 32% in 2018 accounting for $3.27 billion of the Bank's finance.

In addition to addressing the pillars of the action plan, the example projects reported addressed priority areas that are indirectly related to addressing CC mitigation and adaptation needs, including:

- Capacity strengthening

- Technical/technological assistance
- Policy, Institutional, and Organization Reforms
- Engaging women and youth in Climate Change

Reported needs:

Quantified needs: the Bank is committed to enhance access to new and additional climate finance with a target of least $500 million by 2020. The Bank is also committed to ensure 100% of its projects take climate change into account, as opposed to current the 85%.

Document	Financial Requirements	Thematic Area	Notes
Climate Change and Green Growth - 2018 Annual Report	**$0.5 billion by 2020**	Climate finance	The Bank is committed to ensure 100% of its operations are climate-proofed, as opposed to current the 85%

Unquantified needs: Even though they are reported as indicators of progress in the example projects, there are no targets or quantification of needs regarding capacity strengthening, technical/technological assistance, institutional and Organization Reforms, or engaging women and youth in Climate Change.

The report explicitly states that the Bank's pipeline of high quality projects currently exceeds the funding envelope available by the Bank. Yet, there is no identification or quantification of such deficit.

The effects of CC on road infrastructure are worse in Central, Eastern, and Western Africa (this could rectify any needs identified or quantified in their corresponding integration strategies).

Infrastructure and Urban Development Department Report 2019

The report highlights The Bank's activities in 2018 in support of the construction of roads, railway, ports, airports and urban infrastructure in the context of the operationalizing the "Integrate Africa" high5 priority area, and the Bank's Regional Integration Strategies (RISP). The report reinforces the Bank's focus on infrastructure development. Infrastructure projects approvals accounted for 21% of the Bank's total portfolio in 2018 (19 projects worth $1.9billion, compared to 16 in 2017 and 14 in 2016).

Scope:

The department's 2018 portfolio focused on East Africa (30% of total investments), followed by Southern Africa at 12%, Central Africa at 7% and Northern Africa at 5%. The scope of the department's CC-related activities including reducing transport related emissions as a mitigation measure, and improving air quality and urban mobility networks as an adaptation measure. The 2018 portfolio presented includes more national projects

from different African regions, followed by regional projects in Southern and Eastern Africa.

Sectors reported: Infrastructure development

A total of 18 projects were approved in 2018 addressing CC mitigation through emissions reduction and adaptation through enhanced mobility and air quality:

- 12 Road projects (22% of total investment in 2018)
- 2 Airport projects (11%),
- 2 Urban Development projects
- 2 port projects

Reported needs:

Quantified needs: the report does not provide quantified targets or needs.

Unquantified needs: Social development challenges such as **youth and gender** issues are recurrently reported as co-benefits in many of the department's presented projects, especially on adaptation and resilience building. 6 of 19 projects addressed women and youth issues as co-benefits. However, the achievements on both issues were not assessed against targets or quantified needs. Youth and Gender are identified as key priority areas for addressing CC adaptation, sustainable development, AU Agenda 2063, the AfDB's High 5s, and SDGs.

Similarly, **Capacity building** was also reported as project co-benefits, yet were not assessed against quantified targets or needs. 4 of the 19 projects included technical capacity building as one of their main performance indicators.

6.1.29. Paving the way for climate-resilient infrastructure: Building sustainable cities and low-carbon mobility in Africa

The report presents exemplary projects from the Bank's operations supporting Africa's transition to low-carbon and climate-resilient development in the infrastructure sector.

Scope

The projects presented include national and multinational projects, with focus on projects in Western and Southern Africa.

Sectors reported: Infrastructure for resilience building and emissions reduction (mitigation and adaptation co-benefits)

- Urban planning and management
- Road rehabilitation and coastal protection
- Resilience of poor communities to urban flooding
- Urban mobility

- Waste management

Reported needs:

Quantified needs: An estimated $20-25 billion in investments are needed in basic urban infrastructure, and an additional $20 billion per year in housing to respond to urban population growth.

Unquantified needs: These investments need to be climate-proofed. **Additional costs for climate-proofing were identified as a need in the report**, yet without quantification.

Ensuring Africa's Resilience to Climate Change (2019)

The report presents exemplary projects highlighting the African Development Bank's approach to ensure climate resilience and low carbon development in the water sector. Project cost ranges from $30 million to $70 million per project except for project in Morocco ($271 million) and in Eswatini ($1.1billion)

Scope: the report includes national and multinational projects from different African regions. One project was presented from each region.

Sectors: Water and sanitation infrastructure **(Adaptation and resilience building)**

Reported needs: An estimated $13 billion per annum is needed for Africa to meet the SDG goal 6 of universal access to clean water and sanitation.

Climate Information Services 2019

The report presents exemplary projects from the Bank's ClimDev Special Fund activities in 2018. The Fund supports investments in technology projects for climate data production and management

Scope: Most of the presented projects are national projects, along with some regional and multinational projects

Sectors: technology/knowledge management **(relevant to Adaptation):**

- Disaster reduction (floods, drought, cyclones, etc)
- Climate and Weather Observation networks
- Food insecurity
- Water monitoring

Reported needs: climate disasters such as floods and cyclones cause $1 billion in infrastructure damage. Technology needs for disaster prevention are identified yet unquantified.

Climate Change Impacts on Africa's Economic Growth Report

This analytical report assesses the risks and impacts of climate change on Africa's economic growth and development. The report finds that the direct and indirect costs of addressing climate change will be high, but the costs of inaction can be much higher. It also concludes that climate change mitigation and adaptation measures can have macroeconomic benefits such as stability, job creation, and decreased adverse impacts of climate change on development. Total costs needed for mitigation and adaptation can be at least one third higher in the high-warming scenario, and up to twice as high in Eastern Africa.

Scope

The report provides a continental coverage, assessing the impacts of climate change on economic growth of the 5 African regions: Northern, Western, Southern, Eastern, and Central Africa. It provides an assessment based on two scenarios: high warming scenario which exceeds the 2 degree increase stated in the Paris agreement, and a low warming scenario that falls between or below the 1.5-2 degrees increase in global temperature by 2050.

Eastern and Western Africa, would experience the most reduction in GDP per capita due to climate change impacts by about 15 per cent by 2050 (below a baseline GDP scenario), Followed by Southern Africa, Central and Northern Africa. Central Africa is projected to be less affected by climate change than other regions, with the exception of some individual countries such as the Central African Republic and Chad.

Six of the most economically affected countries in 2030 by CC impacts in low and high-warming scenarios include (not in order) Morocco, Sudan, Tanzania, Liberia, Mauritania, and Kenya.

Sectors:

- **Adaptation**: climate-related disasters, Agriculture, coastal protection, water, infrastructure
- Total CC and residual damage costs identified for each Region as % of GDP (in order):
    - Eastern Africa (3% of GDP)
    - Western Africa (2.5%)
    - Central (1.6%)
    - Southern (0.8%)
    - Northern (0.6%)
- Effects of climate change in agriculture is expected to be worse in Eastern and Western Africa, since the highest share of gross regional product comes from agriculture (25%),
- Temperature increase would have the most significant impact on the coastal countries.

- Road infrastructure will suffer worst CC impacts in Central, Eastern, and Western Africa
- CC impacts on the water and Sanitation is projected to be worst in Eastern and Southern Africa.

- **Mitigation**: energy sector emissions reduction

Reported needs:

Quantified needs: Adaptation investment needs in Eastern Africa would range between 0.3 per cent of the gross regional product (GRP) in a low-warming scenario, and 0.6 per cent in high-warming scenarios.

In the same scenarios, this cost would reach 0.3 and 0.4 per cent per year of GDP in Western Africa.

Document	Financial Requirements	Thematic Area	Notes
Climate Change Impacts on Africa's Economic Growth Report	0.3-0.6 of GRP (Gross Regional Product)	Adaptation In Eastern Africa	Lower range: low warming climate scenario Higher range: High warming climate scenario
	0.3-0.4 of GRP	Adaptation in Western Africa	

Unquantified needs: Structural change, Education, Health access, Poverty eradication, Capacity-building.

Africa NDC Hub Gap analysis report

Africa NDC Hub focus areas include adaptation and private sector engagement. The NDC Gap analysis report states that adaptation spending is crucial for Africa to reduce vulnerability to CC (i.e., making all investments resilient to climate change). The report also finds that maximizing co-benefits of mitigation activities for adaptation is key to overcoming adaptation funding gaps. Additionally, it acknowledges the importance of private finance participation for fulfilling climate-financing needs.

The report identified key gaps in the reviewed NDCs including:

- Lack of Institutional and technical capacity to identify opportunities for maximising co-benefits from the implementation of well-coordinated economy wide activities to achieve CC targets;
- 14% of country NDCs reviewed in the study did not include financing needs (quantitative)
- Only 6 countries reported broken down financing needs on both adaptation and mitigation (including internal and external sources)
- Only five countries have provided estimates for private sector financing needs

- Many NDCs did not provide complete information for either mitigation or adaptation;
- Lack of MRV systems
- Uncertainties in developing carbon removal technologies, including cost estimation
- Lack of definition, costing and willingness to invest in adaptation, especially from the private sector
- **Adaptation financing gap is realized from African NDCs: Adaptation costs by 2030 estimated to be in the range of $50 and 95 billion/year by 2050. This excludes residual damage costs**
- Lack of enabling frameworks to ensure effective and efficient provision of capacity-building, technology and funding.
- Socio-political instability affects investment environment (relevant to identifying needs to reduce regulatory and political risks to create an enabling environment for private climate financing which make around $125 billion pool of investment)

Scope

The report analyses the NDCs submitted by African countries to the UNFCCC in alignment with the Paris Agreement.

Sectors:

Top sectors related to mitigation, as reported in the reviewed NDCs:

1. Energy

The Africa NDC Hub Gap analysis report identified the energy sector as the top most sector that can help catalyzing the share of **private investments in climate financing, which aligns with the Bank's strategy to encourage collaboration and partnerships with the private sector to mobilize more climate financing.** Renewable energy could supply 22% of Africa's total final energy consumption by 2030, allowing for a $32 billion *per annum* investment ***potential*** by 2030.

2. Agriculture
3. Waste
4. Industry
5. Transport
6. Construction

Top sectors related to **adaptation**, as reported in the reviewed NDCs:

1. Agriculture
2. Water
3. Disaster Risk Management
4. Health
5. LULUCF

6. Cross-Cutting areas
7. Coastal protection
8. Energy

Reported needs

Quantified needs:

- Climate finance flows to Sub-Saharan Africa for 2015/2016 was $12 billion on average, and $8 billion for the Middle East and North Africa (ibid).
- **Mitigation costs:**
  - 2030 baseline emissions scenario: 3700 $MtCO_2eq$
  - 2030 Unconditional reduction scenario: 9% : 3400 $MtCO_2eq$
  - 2030 conditional reduction: additional 32% to reach 2100 Mt CO_2eq (42% total reduction expected from full NDC implementation)
  - Global estimated cost of emissions reduction is estimated at just under $100/ t CO_2eq
  - 1300 Mt CO_2eq in 2030 is the reduction potential for conditional commitments (3400-2100)

  - **Mitigation Costs needed in 2030 to meet conditional NDC commitments: 100 $ /tCO_2eq * 1300 MtCO_2eq = $130 billion**

  - Reductions from conditional NDC commitments implementation account for 77% of overall reduction (based on 2030 basline)
- **Adaptation costs:**
- Adaptation costs by 2030 estimated to be in the range of $50 and 95 billion/year by 2050. This excludes residual damage costs
- In 2030:
  - adaptation cost for Africa will amount to $15 billion per year
  - International public finance needs to be 6x to 13x higher than the amount mobilized in 2017 ($22.5 billion) to meet global climate financing demand.
- Adaptation costs by 2100 represent less than 1% of African GDP in a below 2˚C scenario or as much as 6% of African GDP for an over 4˚C warming scenario
- All reported climate finance needs allocated more mitigation financing needs (more than 65% of total investment needs reported) than adaptation.
- **72% of NDCs do not include investment plans**
- Climate finance resource mobilisation for NDC implementation at national level since 2016 is between $1 million to $100 million:
- 63% of countries stated that they were able to mobilize less than $1 million for NDC implementation
- 38% of countries mobilized between $1 million to $10 million
- Only 15% of countries managed to secure between $10 to $100 million towards NDC implementation
- 43% of NDCs included detailed information on stakeholder engagement activities

Unquantified needs: private finance participation, Effectiveness and Efficiency of Resource (funds) Use, Non-financial Interventions for Climate Action, Innovative technology development and transfer (through policy, institutional and organisational reforms of country and regional enabling environments), Reliable climate data and knowledge production.

Thematic areas explicitly stated in all NDCs as the most urgent challenges to implementation:

- Financial resources
- Technology/ Technical Assistance
- Capacity Building Needs
- Institutional reforms and strengthening (ministerial and sectoral collaboration and coordination)
- Socio-economic situation
- Legal framework
- Availability of climate data

Africa NDC Hub Analysis of Adaptation components in African NDCS

The report analyses the adaptation reporting in African NDCs. The report finds that targeted resource mobilisation efforts and designing immediate and future adaptation interventions are only possible when countries identify and quantify current, short-term, and long-range adaptation needs, priorities, goals, and measures. The report also finds that **African NDCs state their adaptation goals primarily in qualitative, descriptive terms and do not include specific project needs, target number of beneficiaries, or amount of investments sought**. Reported gaps in the report:

- Lack of synergy between sectors and institutions and a lack of relevant data
- Only Four countries explicitly mention a need for supporting the NAP process as part of strengthening policy processes.

Sectors

Vulnerable and priority **adaptation** sectors:

- Water (mentioned by 43 countries)
- Agriculture (42)
- Disaster risk reduction (35)
- Health (32)
- Biodiversity and ecosystems (31)
- Human settlement and land management (33)

Reported needs

Quantified needs: Total cost of adaptation for Africa (derived from figures provided by 28 NDCs) is reported for 2020, 2030, and 2050 as shown in Table 6-3

Table 6-3 Annual average adaptation costs for Africa by 2020, 2030, and 2050

	2020 ($billion)	2030 ($billion)	2050 ($billion)
Annual average adaptation costs for Africa	7.4	51.8 – 81.4 ($44 billion to $74 billion more than 2020 costs)	96.2 – 170.2 ($88.8 billion to $162.8 billion more than 2020 costs)

36% ($2.7 billion) of the total annual cost projected for adaptation by 2020 will come from domestic sources, while 64% ($4.7 billion) will need to come from International sources. This is based on figures provided in nine NDCs (Only nine countries explicitly stated domestic/international cost figures.

The average annual projected sectoral adaptation costs were reported for the five top priority sectors as shown in Table 6-4:

Table 6-4: Projected annual adaptation costs as reported in African NDCs

Sector	**Annual projected costs until 2020 ($billion)**	**Annual projected costs by 2030 ($billion) (6x to 10x increase needed)**	**Annual projected costs by 2050 ($billion) (12x to 22x increase needed)**
Agriculture	0.4	2.4 – 4	4.8 – 8.8
Water	0.3	1.8 – 3	3.6 – 6.6
Health	0.2	1.2 – 2	2.4 – 4.4
Energy	0.2	1.2 – 2	2.4 – 4.4
Biodiversity and ecosystems	0.2	1.2 – 2	2.4 – 4.4

On a regional basis, the annual projected adaptation costs by 2020 were estimated and provided in the report:

- Western Africa proposes the highest cost, estimated at $2.1 billion every year
- Northern Africa proposes the lowest cost, estimated at $0.963 billion per year by 2020).
- Eastern Africa proposes $2.6 billion every year
- Southern Africa proposes $0.727 billion per year.
- Central Africa: no estimation was provided in the report, yet table (3) in the report provided reported adaptation costs in the 28 analyzed NDC, 3 of which are from Central African Countries (Cameroon, Central African Republic, and Chad). The total estimated cost for these countries is $0.175 billion. This excludes Congo, Democratic Republic of Congo, Equatorial Guinea, and Gabon. Since the estimation methodology was not reported, deriving a regional figure consistent with the aforementioned estimates was not possible.

Unquantified needs:

- Gender inclusiveness in adaptation policies and projects (mentioned in 24 NDCs)
- Support of vulnerable groups (youth, women, and children)
- Monitoring, evaluation, and reporting (MRV and M&E)
- Capacity building and technical support (mentioned in 36 NDCs)
- Technology transfer (mentioned in 36 NDCs) (The top three technology development and transfer needs for NDC implementation are: 1 generating climate information; 2 designing and implementing early warning system; and 3 data collection, analysis and storage).

Africa NDCHub Roadmap and Work Programme

This analytical report presents the role of the NDCHub in supporting the implementation of African NDCs under four scenarios: Strong governance, and abundant Climate finance Strong governance, scarce finance Weak gov, abundant finance, and Weak gov, scarce finance. The report provides 3-5 year activities plan for:

- Guidelines for aligning NDC with national development plans ($50-100 thousand)
- Annual flagship meet-up ($300-500 thousand per year)

Sectors

- Local scale infrastructure projects that enable self-sufficiency and low carbon (**mitigation with adaptation co-benefits**)
- sustainable agriculture and forestry programmes (AFOLU) (**Adaptation**)
- sustainable land management practices (AFOLU) (**Adaptation**)

Reported needs

Quantified needs: Sectoral analysis and development of sectoral plans ($500 thousand-1 million for 5 year plans) (third pillar of the work programme)

Unquantified needs: Local education and awareness raising programmes, private sector engagement, micro-financing, Monitoring, Evaluation and Reporting (MRV), Decentralised Climate Finance (DCF) and Climate-Smart (proofed) Investments, and South-South technology transfer (capacity strengthening).

African Financial Alliance on Climate Change brochure 2018

The African Financial Alliance on Climate Change helps attracting private investments to increase Africa's share of global climate finance and help African countries achieve their NDCs in alignment with high5s, SGDs, and national priorities. 8 types of institutions are members in AFAC (ministries, commercial banks, institutional investors, insurance companies, MDBs, stock exchange, central banks, and national and regional development banks). The report highlights the key 2018 activities.

Sectors: Energy (relevant to CC mitigation)

The potential pool of investment in renewable energy projects in Africa amount to US $32 billion per annum by 2030.

Reported needs:

Quantified needs:

- Total of $150 billion to $350 billion is needed for Adaptation in Africa by 2030 (not per year)
- Adaptation costs will be around $35 billion per year until the 2040s and $200 billion per annum by 2070.
- The **cumulative investment needs in the energy sector** (according to the IRENA database) between 2015-2030 for all renewable energy generation types is $681 billion ($45.5 billion annually). Estimations per region were also provided as follows:
    - Northern Africa: $342 billion: approximately $22.8 billion annually
    - Southern Africa: $145 billion: $9.7 billion annually
    - Western Africa: $89 billion: $5.9 billion annually
    - Eastern Africa: $72 billion: $4.8 billion annually
    - Central Africa: $32 billion: $2.13 billion annually
- Climate change presents a $3 trillion investment requirement in Africa by 2030 based on African NDCs (no methodology for determining this number provided). 75% of the investment is expected to come from the private sector.
- Additional $6tn are needed for infrastructure investments per year until 2030.

AfDB 2019-2021 Work Programme and Budget

The report outlines the strategic priorities, operational work programme and estimated resource requirements of the African Development Bank Group for the period 2019 – 2021. The **demand for the Bank's resources from 2018 to 2020 amounts to UA 41 billion ($56.58 billion)**. Bank Funds are insufficient to meet this amount, so the Bank is seeking additional external sources through General Capital Increase (GCI-VII), and through co-financing with multilateral and bilateral institutions and private sector entities to leverage expertise across all key sectors.

The Bank's Indicative Operational Programme (IOP) for 2019 was UA 11.448 billion ($15.8 billion), whereas the **Bank Group's actual annual lending capacity was UA 6.9 billion ($9.5 billion)** for the same year. This indicates **an accumulated financing gap of $6.3 billion** carried over to the following year 2020. Financing Operations distribution by High 5s priority areas for 2019 is 32% for "improve quality of life for the people of Africa", 19% industrialize Africa, 18% feed Africa, 16% light up, and 15% integrate Africa.

Scope: This work programme focuses on Bank's support for results and delivery of projects, and not just lending or mobilizing funds (being a knowledge broker). The Bank has prioritised the scaling-up of investments in projects in hard infrastructure and 'soft'

interventions. The project pipeline is a reflection of the aspirations of the SDGs and the High 5s. The Bank aims to scale up climate finance to reach 40% of Bank's total project approvals by 2020 and aim to reach parity between climate adaptation and mitigation finance.

Sectors: The Bank's pipeline for 2019-2021 is UA 25.3 billion ($34.9 billion), and primarily includes the following sectors:

- Energy (**mitigation measures**)
- Water and Agriculture and Transport (**Adaptation measures**)

Projects on energy and agriculture worth $169.6 million were approved by the Green Climate Fund Board in October 2018: $77 million from the Climate Investments Funds (CIFs), $26.3 million from the Global Environment Facility and $2.2 million from the Adaptation Fund (AF).

- Transport, ICT, soft interventions (**Mitigation and adaptation co-benefits**)

Reported needs

Quantified needs:

- **Africa's total financing requirements are estimated at $800 billion per annum**.
- **The Bank's pipeline for 2019-2021 (3 years) is UA 25.3 billion ($34.9 billion)**
- 2019-2021 Trust Funds Annual Allocation (UA million 37, 40, 42): 40% Resource Available for commitment in 2019, 45% in 2020 and 45% in 2021.
- Innovative financing instruments (results-based financing RBF). The first RBF was approved in 2018 for an amount of $269 million.
- High5 related needs:
  - Feed Africa (agriculture): targeted annual lending of US$2.4 billion per year. Over the 2019-2021 period, the Bank plans to invest UA 3.2 billion in Agriculture operations.
  - Light-up and power Africa (energy): Capitalizing on renewable energy potential (over 10 TW of solar potential, 350 GW of hydroelectric potential, 110 GW of wind potential and an additional 15 GW of geothermal potential). Between 2016-2020, the Bank targets a $12 billion investment threshold in energy.
  - Integrate Africa (transport, trade and urban management): implementing the newly approved 2018-2025 Regional Integration Strategic Framework (RISF) (total implementation costs reported in Section 2.2.1).
  - Industrialize Africa (Industry): mobilizing UA 40 billion ($55.2 billion) and raise Africa's industrial GDP to 130% by 2025.

Unquantified needs:

- Improve the quality of life of the people of Africa (multisector): support projects in urban development, ICT, social development, health and nutrition, and youth employment. Investments will target selected areas of Technical Vocational Education and Training (TVET), Higher education, Research and innovation, Science, Technology, Engineering and Mathematics (STEM), with a strong focus on gender.
- Policy support to create an enabling environment for private sector development
- Technical assistance: integrated regional power pools, transport and ICT infrastructure.
- Women's capacity building.

AU Agenda 2063 10 year implementation plan

The plan is the first 10-year operational plan aiming to guide the implementation of the AU Agenda 2063 developed and launched in 2013 as the overarching development vision for the continent. The plan presents the Goals and Priority Areas for the First Ten Years of Agenda 2063. It sets targets for the period 2013-2023.

The AU Agenda 2063 includes a financing plan, the instruments and processes on uses of funds and sources of funds. Financing of the plan will depend on 70-90% domestic financing (within AU), **and 10-30% external resource mobilization** (through innovative financial instruments and partnerships). **However, the plan neither states the availability of these funds, nor quantifies the total investment needed for the implementation of the 10-year plan.** The plan's roadmap explicitly includes climate change as a driver for its activities.

The report states that leveraging Africa's Strategic Partnerships is paramount for the plan/agenda's success.

Thematic areas: Adaptation- Sectors: relevant to CC adaptation

- Sustainable and inclusive economic Growth
- Economic diversification and Resilience
- Agricultural Productivity and Production (AFOLU)
- Sustainable natural resource management and Biodiversity conservation
- Sustainable consumption and production patterns (AFOLU)
- Water security
- Climate resilience and natural disasters preparedness and Prevention
- Communications and Infrastructure
- Connectivity (Connect Africa through world-class Infrastructure)

Thematic area: mitigation - Sectors relevant to CC mitigation: Energy Efficiency (EE) and Renewable Energy (RE)

Reported needs:

Unquantified needs: The plan's priority areas that are indirectly related to CC:

- Incomes, Jobs and decent work
- Poverty, Inequality and Hunger
- Social security and protection Including Persons with Disabilities
- Health and Nutrition
- Women and Girls Empowerment
- Violence & Discrimination against Women and Girls
- Youth Empowerment and Children (Programmes on climate change targeting women and youth)
- ICT in addressing CC (five regional technology centres, linking with national designated climate technology entities)

Annex 2 - Review Summary Table

a. Thematic area (Th.A): Adaptation (A), mitigation (M), financial (F), Technical/Technological (TT), Institutional arrangements (Inst.)
b. Scope: Timeframe: short, medium, long term; Geographical: local, sub-regional, regional, national; Project phase: ideas, projects, programs and associated conceptualization/development
c. Sectorial (Sect.): Energy (E), Waste (W), Industrial processes (I), AFOLU, Transport (T), Water/Sanitation (W), Infrastructure Development (Inf), education (Edu), youth (Y), gender (G), poverty reduction (P), economic (Ec), Manufacturing (Mfg), Employment (Emp)
d. Other acronyms: Active Portfolio AP, Regional Indicative Operations RIO

Report	Main message	Needs directly related to climate	Needs indirectly related to climate	Methodologies, underlying assumptions	Incomplete information	Notes
Eastern Africa Regional Integration Strategy Paper 2018 - 2022 Burundi, Ethiopia, Rwanda, Sudan, South Sudan, Uganda Kenya, Tanzania and Djibouti, Eritrea Seychelles Comoros	2 pillars: (1) regional infrastructure development, (2) policy/ institutional strengthening Regional Specificities by Sect.: E: power shortages, low electricity access rates, cost electricity 4x global average, limited power market for; reliance on biomass for primary cooking fuel, significant oil and gas reserves: 750 million barrels in Kenya, 1.5 billion barrels in Uganda, 1 billion barrels in S. Sudan T: underdeveloped networks land, maritime, air W: transboundary water resources management challenges S: Poverty, rising inequality, youth unemployment F: Low private sector engagement Trade: low value-added product Instit./CB: weak policy and instit. capacities for intra-regional trading Political: fragile status countries (7/13); humanitarian problems:	Reported needs: RIO Scope: 2018-2022 Th.A:M; Sect.: E 1129 M UA *(excl. 3 projects TBD for AfDB; incl. 1082 mUA for PPP)* Th.A:M; Sect.: T 936 MUA Unspecified needs: Th. A: A; Sect.: AFOLU (Ann. 2): AP: 13% (total); *no agric. projects in RIO* Th.A: I; Sect. Mfg Costs for diversifying products- goal is trade, but requires industrial processes (→ emissions) Unquantified needs: Th. A: Inst.: harmonize policies for regional	Th. A: Ec. Sect.: Trade (value-added product) Sect.F.: integration, inclusion; private sector engagement Th. A: G,Y, Emp Th.A: TT: ICT Th.A.: Inst./CB Sect.: Ec/I. SEZ "Industrialization Strategy for Africa (2016-2025)"- *IOP Bank resources* **Th.A:** F Limited access to concessional funds for non-ADF countries→ con-finance needs, needs for risk-	Methodologies for developing RISP including RIO: Lessons learned (Regional Portfolio Performance Review (RPPR), BDEV, Banks knowledge works) Alignment with sectoral, national, continental strategies Regional Diagnostic Note: basis sectoral analytical notes, economic sector works (ESWs), consultations including private sector, development partners (DPs) Consultative process (RECs, Country Economists) Underlying assumptions: Targets/development	Overlapping memberships of countries across regions	Ineligibility of non-ADF countries IGAD Drought Resilience & Sustainable Livelihood Program Concessional funds non-ADF countries not considered Regional Synthesis Report on Manufacturing Sector in EA IOP: midterm 2020 update Bank' filtering process for IOP selection Scope for infrastructural gap not specified: reference made to PIDA

a. Thematic area (Th.A): Adaptation (A), mitigation (M), financial (F), Technical/Technological (TT), Institutional arrangements (Inst.)
b. Scope: Timeframe: short, medium, long term; Geographical: local, sub-regional, regional, national; Project phase: ideas, projects, programs and associated conceptualization/development
c. Sectorial (Sect.): Energy (E), Waste (W), Industrial processes (I), AFOLU, Transport (T), Water/Sanitation (W), Infrastructure Development (Inf), education (Edu), youth (Y), gender (G), poverty reduction (P), economic (Ec), Manufacturing (Mfg), Employment (Emp)
d. Other acronyms: Active Portfolio AP, Regional Indicative Operations RIO

Report	Main message	Needs directly related to climate	Needs indirectly related to climate	Methodologies, underlying assumptions	Incomplete information	Notes
	Ethiopia, Uganda, Kenya hosting refugees Economic: growth poles IOP of new RISP (50 operations): • Bank Indicative resource requirement: UA2.38 billion • Total RISP = UA4.45 billion • Co-financing: UA2.07 billion Regional Infrastructure gap (EAC) 17 regional infrastructure projects $78 billion (p.10)-	resource mngmt.→shared infrast.(ref.13) "Support needed to attract more investment through Natural Resources Centre and Africa Legal Support Facility" Th.A.: Inst/CB- Implementation cost of Bank's regional improvement plan (*unless accounted by project 43 statistical CB REC, RMC → may have implications on increasing bankability of energy projects (New Deal)* Th.A: A Rising sea level, drought, floods Th.A M.–Sect.: E.: Green growth, renewable energy;	sharing instruments to finance infrastructure projects	indicators, e.g., needs to fill infrastructural gap based on Africa Infrastructure Development Index (AIDI-2018) scores *(EA countries <30/100 excl. Seychelles)* Africa Regional Integration Index Africa Economic Outlook 2018 Theory of Change: 1-Region specificity 2- Geographical market potential 3-CSPs complementarity 4-Private sector role for transformative growth and necessary factors (e.g., enabling environment for private sector participation) 5-New results measurement tools: Priorities Alignment :RISP, client, Bank strategies, performance matrix		(which has a timeframe 2012-2040)]

a. Thematic area (Th.A): Adaptation (A), mitigation (M), financial (F), Technical/Technological (TT), Institutional arrangements (Inst.)
b. Scope: Timeframe: short, medium, long term; Geographical: local, sub-regional, regional, national; Project phase: ideas, projects, programs and associated conceptualization/development
c. Sectorial (Sect.): Energy (E), Waste (W), Industrial processes (I), AFOLU, Transport (T), Water/Sanitation (W), Infrastructure Development (Inf), education (Edu), youth (Y), gender (G), poverty reduction (P), economic (Ec), Manufacturing (Mfg), Employment (Emp)
d. Other acronyms: Active Portfolio AP, Regional Indicative Operations RIO

Report	Main message	Needs directly related to climate	Needs indirectly related to climate	Methodologies, underlying assumptions	Incomplete information	Notes
		agriculture- *costs in NDCs*		6-IOP 7-Evidence based dialogue & policy advice		
Central Africa Regional Integration Strategy Paper (RISP) 2019 - 2025 CA- 11 countries (operational activities: exclude Burundi and Rwanda;	2 pillars: (1) regional infrastructure: technology interventions and (2) institutional strengthening and capacity building for harmonizing and operationalizing institutional frameworks to allow intra-regional trade and investments. Specificities of CA: Sect. Ec.: no econ. diversif., weak econ. resilience (oil dependence P: inequality Emp.: Youth unemployment Political: fragility, control of natural resources Socio-eco dvpt: reliance on nat. resources: oil, precious metals, minerals, water, hydropower (58% of Africa's potential) IOP 2019-2025 RISP - 30 operations • Bank: UA 2.008 billion *(incl. AfDB, ADF, Others)* • Total RISP = UA3.185 billion • Co-financing: 1.178UA billion	Reported needs: RIO Scope: 2019-2025 Th.A: M. Sect. T: 450 MUA E: 400 MUA Th.A: CB/Tech.Ass. I: 10 mUA (*timber sector Congo Basin*) Clim./Env.:78.1 mUA *(Ecosystem Conserv. Congo Basin)* Unreported needs: Water in active portfolio, but not in IOP	Reported needs, *but not quantified (via IOP)* Th.A: F private sector for mobilizing resources→ need enabling environment, instit. reforms increase bankable energy project (energy power pool) 3 projects under IOP for finance, none with co-financiers, but needs on identifying co-financing and partnerships reported, incl. support in	1) Lessons learned: Bank interventions (2011-2016) 3) sector diagnostic study (2017), ESW (incl. timber in Congo Basin) Consultation process (RECs, DPs, private sector, regional authorities) and ECCAS, CEMAC Underlying assumptions: Development indicators/targets: AIDI: objectives incl. resource allocation within ADF Access to services: (e.g., electricity access CA: 27.1% vs Africa: 51.6) Physical indicators: new energy capacity (MW), new/upgraded roads (km) Change theory: links between activities, outputs and outcomes of RISP-CA 2019-2025"		Central African Economic and Monetary Community (CEMAC) RIO : ICT: 240 MUA

a. Thematic area (Th.A): Adaptation (A), mitigation (M), financial (F), Technical/Technological (TT), Institutional arrangements (Inst.)
b. Scope: Timeframe: short, medium, long term; Geographical: local, sub-regional, regional, national; Project phase: ideas, projects, programs and associated conceptualization/development
c. Sectorial (Sect.): Energy (E), Waste (W), Industrial processes (I), AFOLU, Transport (T), Water/Sanitation (W), Infrastructure Development (Inf), education (Edu), youth (Y), gender (G), poverty reduction (P), economic (Ec), Manufacturing (Mfg), Employment (Emp)
d. Other acronyms: Active Portfolio AP, Regional Indicative Operations RIO

Report	Main message	Needs directly related to climate	Needs indirectly related to climate	Methodologies, underlying assumptions	Incomplete information	Notes
			preparation of infrastructure projects Bank funds: AfDB, AFD, TSF, AWF, NEPAD-IPPF	Insufficient amount co-financed resources mobilized and insufficient number of project co-financed		
Regional Integration Strategic Framework-revised Feb 2018	RISF pillars: 1) infrastructure connectivity, 2) trade/investment, 3) financial integration to support priorities of African union vision 2063 of reaching deep integration for intra-African trade (20%: 2025; 50%: 2045) Includes ICT Bank financial resources: UA 8.9 billion: RISF2018-2025	Scope: 2018-2025 Th.A: M/A. Sect. E, T, W, , Infras. financing needs: $130–$170 billion/year. Total commitments: $63 billion in 2016, **Financing gap $67–$107 billion a year**	Soft infrastructure logistics, gender responsive cross-border and trade facilitation policies, measures)	Methodology Lessons learned: analytical works-Economic Governance and Knowledge Management (ECVP), Bank Independent Development Evaluation (BDEV)'s; consultations/feedback: internal: senior management, previous RISPs, input from sector complexes; external: private sector, RECs, MDBs, RMCs etc. Underlying assumptions: AEO: Estimates based on % RI allocation/sector: Regional Integration allocations to Energy 15%,		Regional Dvp Integration and Delivery Complex (RDVP),

a. Thematic area (Th.A): Adaptation (A), mitigation (M), financial (F), Technical/Technological (TT), Institutional arrangements (Inst.)
b. Scope: Timeframe: short, medium, long term; Geographical: local, sub-regional, regional, national; Project phase: ideas, projects, programs and associated conceptualization/development
c. Sectorial (Sect.): Energy (E), Waste (W), Industrial processes (I), AFOLU, Transport (T), Water/Sanitation (W), Infrastructure Development (Inf), education (Edu), youth (Y), gender (G), poverty reduction (P), economic (Ec), Manufacturing (Mfg), Employment (Emp)
d. Other acronyms: Active Portfolio AP, Regional Indicative Operations RIO

Report	Main message	Needs directly related to climate	Needs indirectly related to climate	Methodologies, underlying assumptions	Incomplete information	Notes
				Transport 22%, Water 5%, and ICT 10%.		
Regional integration policy and integration (RIPoS) 2014-2023	3 pillars: 1) regional inf. dvpt, 2) enhancing industrialization and trade, and 3) cross-cutting: strengthening regional mechanisms and institutional capacities To be implemented through RISP and CSP Infrastructure deficit: $48 billion a year *Financing requirement for bankable projects 'huge'*	Reported needs, but not quantified Th.A M Sect.: E: dvp hydroelectricity, regional gas pipeline, promote power pool interconnections and industrial zones Industry T: develop, upgrade networks (rail, water, highways) ICT: land fiber-optic infrastructure, submarine cables W: dvp dams, transboundary river resources, programs for flood control, drought etc. Th.A CB/Inst. Sect.: T, E, ICT, W	Reported needs, but not quantified Th.A: CB/Instit. Inclusive growth: fragile states, SME, women, youth Th.A: F Instruments: ADF, ADB, co-financing (funds: NEPAD IPPF,AWF,MIC Trust Fund, Africa Trade Fund, Africa50), Gulf States, India, China, Russia, not-for-profit NGOs Dakar Agenda for Action (DDA), private sector	Methodology Continental/regional priorities: Program for Infrastructure Development in Africa's Priority Action Plan (PIDA-PAP) Transport and Trade Facilitation Framework Lessons learned from previous Bank interventions IDEV evaluation results of multinational operations Underlying assumptions: targets/development indicators		

a. Thematic area (Th.A): Adaptation (A), mitigation (M), financial (F), Technical/Technological (TT), Institutional arrangements (Inst.)
b. Scope: Timeframe: short, medium, long term; Geographical: local, sub-regional, regional, national; Project phase: ideas, projects, programs and associated conceptualization/development
c. Sectorial (Sect.): Energy (E), Waste (W), Industrial processes (I), AFOLU, Transport (T), Water/Sanitation (W), Infrastructure Development (Inf), education (Edu), youth (Y), gender (G), poverty reduction (P), economic (Ec), Manufacturing (Mfg), Employment (Emp)
d. Other acronyms: Active Portfolio AP, Regional Indicative Operations RIO

Report	Main message	Needs directly related to climate	Needs indirectly related to climate	Methodologies, underlying assumptions	Incomplete information	Notes
North Africa Regional Integration Strategy Paper (RISP-NA) 2020-2026 Algeria, Egypt, Libya, Mauritania, Morocco and Tunisia	3 pillars: 1) regional infrastructural interconnectivity; 2) private sector promotion for inter-intraregional trade/investment, accelerate industrialization 3) CB/institutional (high level policy dialogue) Regional specificities: Natural resources: Libya/Algeria: oil; Mauritania: metals Mfg % to GDP: 7.4%-27.2% A: water stress, drought, floods Regional industrial dvpt potential (Egypt, Morocco and Tunisia): Renewable energy automobile/aeronautical components, mining, agri-food. Intra –industry trade Cross-cutting issues: G:gender issues, Emp. unemployment Structural deficit: water resources, food and energy security RISP 2020-2026 (17 'projects identified') • Total: UA231.3 million** • Explicitly stated as conditional to resource availability: UA 0.6m	Reported needs- RISP identified projects *(as potential technical assistance or potential loans)* Th.A: M/inf. Sect. E. UA140 m (elect. Grid) Th.A: CB/Inst./TA Sect. T/Trade: UA5.4 m (studies) Reported needs (PIDA-PAP) NA-PIDA: 2012-2040 investment of $115.5 billion for all sectors = 8.9% (total PIDA continental) Priority Action Plan (2012-2020): $2.25 billion T: $825 million (36.7%) E: 53.4% ICT: 9.1%	Th.A: CB/Inst./TA Sect. AFOLU (A)/F: UA0.6 m Th.A: CB/Inst./TA Sect. E/Trade: UA1.4 m Thematic area: Finance: tripartite cooperation Thematic area: social: gender sensitivity in implementation of operations Type of funds for implementation of RISP-5.3	Methodology for preparation of RISP: participatory process, nat./reg. consultations with Authorities, civil society, DP, private sector; ESW; Alignment with NA dvpt priorities, RISF 2020-2025, AU 2063, PIDA, COMESA Bank Technical Notes "Industrialization and Value Chains", "Renewable Energy", "Transport Infrastructure" "Financial System" Lessons learned (BDEV of CA) Strong reliance on consultations (weak political commitment for RI in NA) **Underlying assumptions** Socio-eco indicators: youth unemployment rate,	Absence of REC covering all 6 countries → no regional projects and non-borrowing Algeria and Libya can result in unidentified needs, where needs are defined as operations	General note on RISPs: different timeframes Diagnostic notes are now required (starting 2018) to guide Bank's intervention COVID-19: →implications needs Examples of projects for renewable energy in Morocco Promotion of RE p.8

a. Thematic area (Th.A): Adaptation (A), mitigation (M), financial (F), Technical/Technological (TT), Institutional arrangements (Inst.)
b. Scope: Timeframe: short, medium, long term; Geographical: local, sub-regional, regional, national; Project phase: ideas, projects, programs and associated conceptualization/development
c. Sectorial (Sect.): Energy (E), Waste (W), Industrial processes (I), AFOLU, Transport (T), Water/Sanitation (W), Infrastructure Development (Inf), education (Edu), youth (Y), gender (G), poverty reduction (P), economic (Ec), Manufacturing (Mfg), Employment (Emp)
d. Other acronyms: Active Portfolio AP, Regional Indicative Operations RIO

Report	Main message	Needs directly related to climate	Needs indirectly related to climate	Methodologies, underlying assumptions	Incomplete information	Notes
	• Projects associated with specific potential lending entity: UA83.9 m • Needs: 147.4 (231.3-83.9)* *Unclear if funds are available: "AfDB operations that can be implemented during RISP-NA 2020-2023" Costs defined as 'potential TA and potential loans' **excluding 2 projects under discussion Tripoli-Niamey-N'Djamnea corridor (Lybia) and Africa Trade Platform project (Egypt) – needs not estimated	Water: 0.8% Reported needs (via statements), but not quantified into identified projects (under RISP 2020-2026) Th.A: M; Sect. E.: renewable energy potential Th.A: A/M; Sect. AFOLU (A): climate smart practices, efficient irrigation		% share intra-regional trade Share of domestic credit to the private sector (% of GDP) Insufficient number of project co-financed and PPP partnerships		
West Africa Regional Integration Strategy Paper 2020-2025 Benin, Burkina Faso, Cabo Verde, Côte d'Ivoire, Gambia, Ghana,	Priority Areas 1)Enhancing resilient cross-border Infrastructure and 2) Supporting Regional Enterprise Development. Specificities of WA: Sect. P: inequality, Inf.: limited regional connectivity Trade: low intra-regional (NTBs) gender inequality E: hydro, biomass supply variability	Reported needs (ILP) Th.A: M/A/ TT/Inf. Sect. E: 1120 UA million T: 141 UA million Env. : 225 UA million AFOLU (A) : 293 UA million Th.A: CB/Inst. Sect. T: 66 UA million	Types of funds: *ADB 35%, Nigeria Trust Fund* (0.4%), and Trust Funds (6.5%)- 2019 RPPR Reported, but unquantified Th. A: F,M,A,TT; Sect. AFOLU-	Methodology: identification priority areas Stkld. consult. Lessons learned BDEV Alignment: TYS; High 5s RISF, ECOWAS CSF, dev./regional integration priorities of WAEMU and ECOWAS Member States (Master plans etc.		Comprehensive Strategic Framework for Sustainable Fisheries and Aquaculture Development (2020-2030). Annex 5B "Sahel Commission Investment Plan and Priority Action

a. Thematic area (Th.A): Adaptation (A), mitigation (M), financial (F), Technical/Technological (TT), Institutional arrangements (Inst.)
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c. Sectorial (Sect.): Energy (E), Waste (W), Industrial processes (I), AFOLU, Transport (T), Water/Sanitation (W), Infrastructure Development (Inf), education (Edu), youth (Y), gender (G), poverty reduction (P), economic (Ec), Manufacturing (Mfg), Employment (Emp)
d. Other acronyms: Active Portfolio AP, Regional Indicative Operations RIO

Report	Main message	Needs directly related to climate	Needs indirectly related to climate	Methodologies, underlying assumptions	Incomplete information	Notes
Guinea, Guinea Bissau, Liberia, Mali, Niger, Nigeria, Sierra Leone, Senegal and Togo	Env: Degradation eco-tourism threats AFOLU: Poor farming, vulnerability due to variable rainfall, loss of cultivable lands due to rising temp Poor fishing practices A: impacts to energy, transport, coastal infrastructures due to variable rainfall affecting river flows etc. vulnerability and fragility of Sahel Region Indicative Lending Program (38 operations) • Bank resources: UA 1.569 billion • Co-financing: UA 1.865 billion • Total cost of RISP: 3.434 billion UA	(transport corridors) Cross cutting: social: G, Agri, Edu: 20 UA million Reported costs *(not under ILP)* Electricity: "ECOWAS Generation Transmission Masterplan 2012-2025: $26.4 billion." Unreported costs- Th.A: A- Vulnerability to drought, variable rainfall pattern, rise in sea level, blue economy; Niger Basin, coastal erosion, flood risks for coastal infrastructure and cities **Th. A: A/M/TA**: NDC support: complementary studies: "diagnosis, inventories, emissions	impact of COVID-19 on resource re-allocation (reduced investment in agriculture) Resource mobilization for implementation of NDCs *Why is private sector under Bank resources? Ann. 2 Indicative lending programs*	NDCs for climate sensitive projects Prioritizing tools: Regional Operations Selection and Prioritization Guidelines + country resilience and fragility assessment tool Underlying assumptions: Dvpt. Indicators/targets: intra-regional trade (*econometric studies)* Electricity access 65% (2025), % to GDP, gender dvp. index scores		Program (2018-2030): conditions for investments needed to combat climate change in the Sahel as per (NDCs)" Pan-African Agency of the Great Green Wall, the Initiative on Sustainability, Stability, and Security (3S), ECOWAS Renewable Energy Regional Center – ECREEE. **List of projects CC Green growth mainstreamed** Projected costs for NDC support 2020-2030 – midterm review of RISP

a. Thematic area (Th.A): Adaptation (A), mitigation (M), financial (F), Technical/Technological (TT), Institutional arrangements (Inst.)
b. Scope: Timeframe: short, medium, long term; Geographical: local, sub-regional, regional, national; Project phase: ideas, projects, programs and associated conceptualization/development
c. Sectorial (Sect.): Energy (E), Waste (W), Industrial processes (I), AFOLU, Transport (T), Water/Sanitation (W), Infrastructure Development (Inf), education (Edu), youth (Y), gender (G), poverty reduction (P), economic (Ec), Manufacturing (Mfg), Employment (Emp)
d. Other acronyms: Active Portfolio AP, Regional Indicative Operations RIO

Report	Main message	Needs directly related to climate	Needs indirectly related to climate	Methodologies, underlying assumptions	Incomplete information	Notes
		pathways, cost estimates, integration of NDCs into national development plans, Cost-Benefit analysis for low carbon options (Transport, Energy, Industry, waste), GHG accounting across sectors and strengthening national inventory systems for GHG emissions" Needs related to Loss and Damage: environmental degradation cost of coastal areas of Benin, Cote d'Ivoire, Senegal and Togo: $3.8 billion Expected annual damages from coastal flooding in region: $11 billion by 2050s Offshore oil operations/ exploration				

a. Thematic area (Th.A): Adaptation (A), mitigation (M), financial (F), Technical/Technological (TT), Institutional arrangements (Inst.)
b. Scope: Timeframe: short, medium, long term; Geographical: local, sub-regional, regional, national; Project phase: ideas, projects, programs and associated conceptualization/development
c. Sectorial (Sect.): Energy (E), Waste (W), Industrial processes (I), AFOLU, Transport (T), Water/Sanitation (W), Infrastructure Development (Inf), education (Edu), youth (Y), gender (G), poverty reduction (P), economic (Ec), Manufacturing (Mfg), Employment (Emp)
d. Other acronyms: Active Portfolio AP, Regional Indicative Operations RIO

Report	Main message	Needs directly related to climate	Needs indirectly related to climate	Methodologies, underlying assumptions	Incomplete information	Notes
		at risk from sea-level rise Reported, but unquantified "lack of climate finance and institutional capacity to implement low carbon development plans"				
GEF-Approved proposal-Ghana Program on Affirmative Finance Action for Women in Africa (AFAWA): Financing Climate Resilient Agricultural Practices in Ghana	Approved loan targeting agribusiness owned by women Total cost: $25.6 million, where the line of credit costs is $23.5 million, and the lifetime is 5 years. Description of challenges of LFI, private sector engagement, gender non-neutrality in lending, high risk perception for agri investments; Ghana Incentive Based Risk Sharing System for Agricultural Lending (GIRSAL) as an approach to reduce a key challenge: perceived high investment risk resulting in disincentives from local FI/commercial institutions.	Th.A: M. Sect: AFOLU (A) CO_2 reductions Th.A: A CRA interventions: (1) crop rotation, (2) mixed cropping, (3) improved nutrient management, (4) improved genetic resources and (5) minimum tillage.) Mobilization need Agri. Incl. pledges in NDC (M/A): $22.6 billion (2020 -2030)	Th.A: Social: Gender: Women-AFAWA (mainstreaming gender in agric.) Th.A: F Girsal project developed to 'manage' risks:			case study on thematic relating to Finance/financing environment and agricultural sector, which has been reported in RISP as a growing sector.

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c. Sectorial (Sect.): Energy (E), Waste (W), Industrial processes (I), AFOLU, Transport (T), Water/Sanitation (W), Infrastructure Development (Inf), education (Edu), youth (Y), gender (G), poverty reduction (P), economic (Ec), Manufacturing (Mfg), Employment (Emp)
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Report	Main message	Needs directly related to climate	Needs indirectly related to climate	Methodologies, underlying assumptions	Incomplete information	Notes
	The link to actual needs: to implement CCA an enabling financing environment is required, which is one of the challenges in African countries	Th.A: F. NDC for CRA: mobilize $527 million annually in new climate compatible investment public /private/green/mainstreamed' climate objectives within existing finance flowing to agriculture identified in this study (already averages US$270 million annually) ThA:.CB/techn. Assis. 1.5 m $				

a. Thematic area (Th.A): Adaptation (A), mitigation (M), financial (F), Technical/Technological (TT), Institutional arrangements (IA), Capacity Building (CB)
b. Scope: Timeframe: short, medium, long term; Geographical: local, sub-regional, regional, national; Project phase: ideas, projects, programs and associated conceptualization/development
c. Sectorial (Sect.): Energy (E), Waste (W), Industrial processes (I), AFOLU, Transport (T), Water/Sanitation (W), Infrastructure Development (Inf), education (Edu), youth (Y), gender (G), poverty reduction (P)

Report	Main message	Needs directly related to climate	Needs indirectly related to climate	Methodologies, underlying assumptions	Incomplete information	Notes
AFDB – At the Center of Africa's	The strategy has dual objectives, which are: "inclusive growth and green growth" (inclusion of youth and	**Th.A - TT:** skills and technology to underpin inclusive	**Th.A - CB:** strengthening the capabilities and	**NA** Regional and national consultation of all key		Financing the strategy: innovating in existing windows (leveraging all

a. **Thematic area (Th.A): Adaptation (A), mitigation (M), financial (F), Technical/Technological (TT), Institutional arrangements (IA), Capacity Building (CB)**
b. **Scope: Timeframe: short, medium, long term; Geographical: local, sub-regional, regional, national; Project phase: ideas, projects, programs and associated conceptualization/development**
c. **Sectorial (Sect.): Energy (E), Waste (W), Industrial processes (I), AFOLU, Transport (T), Water/Sanitation (W), Infrastructure Development (Inf), education (Edu), youth (Y), gender (G), poverty reduction (P)**

Report	Main message	Needs directly related to climate	Needs indirectly related to climate	Methodologies, underlying assumptions	Incomplete information	Notes
Transformation – Strategy for 2013-2022	women in all development projects and poverty eradication). **Scope:** Long-term, continental, ideas **Sect. – Inf.: $**100 billion for annual infrastructure investments **Specificities incl. challenges:** **Sect. – W:** gap in water and sanitation inf. Weighs 5% of Africa's GDP **Sect. – T:** high T costs increase the price of African goods by 75% **Sect. – E:** 30 countries suffer from recurrent power outages. **Sect. – AFOLU:** is a key sector in Africa that is highly vulnerable to climatic changes and needs infrastructure in rural roads, storage facilities, irrigation and markets (p.20) – food insecurity and high importing rates of food – low value of raw agricultural products **Social**: lack of skills needed for youth to compete in employment markets – Gender inequalities in the majority of the African countries (p.21)..	growth, sustainable and climate-proofing infrastructure development to build resilience	capacities of governmental institutions – policy, regulatory and institutional reforms	stakeholders to determine "a common African position on the post-2015 development framework" focusing on inclusion, sustainability and access to infrastructure??? **Underlying assumptions:** targets and development indicators as basis for determination of needs??		instruments)mobilization of the continent's own resources, climate finance, emerging economies, co-financing, soverign wealth and pension funds, social and philanthropic investors, leveraging Bank capital and new instruments (e.g. more PPP, risk mitigation instruments (e.g. guarantees)) Bank's partners p.24. **Annex 1 – Monitoring Africa's progress** .

a. **Thematic area (Th.A): Adaptation (A), mitigation (M), financial (F), Technical/Technological (TT), Institutional arrangements (IA), Capacity Building (CB)**
b. **Scope: Timeframe: short, medium, long term; Geographical: local, sub-regional, regional, national; Project phase: ideas, projects, programs and associated conceptualization/development**
c. **Sectorial (Sect.): Energy (E), Waste (W), Industrial processes (I), AFOLU, Transport (T), Water/Sanitation (W), Infrastructure Development (Inf), education (Edu), youth (Y), gender (G), poverty reduction (P)**

Report	Main message	Needs directly related to climate	Needs indirectly related to climate	Methodologies, underlying assumptions	Incomplete information	Notes
	Trade: lack of regional integration to connect people and expand trade opportunities across the continent. **Finance**: Low private sector engagement - nascent financial sector that is not fully developed with problems of volatility, scale, long-term liquidity and unfavorable risk perception from international counterparts - public financial management, which is a key hurdle for many RMCs (p.18). **Institutional/CB:** lack of conducive policies and enabling environment for involvement of the private sector **Political:** fragility and lack of stability in some states, which conduces to higher vulnerability in these countries.					
AfDB Strategy for Addressing Fragility and Building Resilience in Africa 2014-2019	There are various funds through which the Bank's contribute to addressing the economic, social, political and environmental fragility drivers, inter alia, ADB, ADF, NTF, FSF - to be renamed Transition Support Facility (TSF) and other trust funds and facilities (p.31) **Scope:** mid-term (5 years), continental, ideas		**Th.A - TT:** impartial access to infrastructure **Th.A - F:** promotion of private sector involvement to lead provision of employment and livelihoods **Th.A - A: (can be relevant to A)**	**Methodologies**: The priorities for building institutions in fragile states have to be in accordance with the government needs, the anticipations of citizens, key risks of the national political economy, and		The expeditious analysis and well understanding of the fragility drivers will facilitate the determination of strategic choices by the Bank at different phases and choose proper instruments such as targeted CB, arrears clearance, Program-Based Operations (PBOs), etc.

a. **Thematic area (Th.A): Adaptation (A), mitigation (M), financial (F), Technical/Technological (TT), Institutional arrangements (IA), Capacity Building (CB)**
b. **Scope: Timeframe: short, medium, long term; Geographical: local, sub-regional, regional, national; Project phase: ideas, projects, programs and associated conceptualization/development**
c. **Sectorial (Sect.): Energy (E), Waste (W), Industrial processes (I), AFOLU, Transport (T), Water/Sanitation (W), Infrastructure Development (Inf), education (Edu), youth (Y), gender (G), poverty reduction (P)**

Report	Main message	Needs directly related to climate	Needs indirectly related to climate	Methodologies, underlying assumptions	Incomplete information	Notes
	Sect.: NA Fragility drivers and sources of resilience will be mainstreamed in the TYS through two ways, which are: i) fragility analysis will be highly considered while opting for the country strategy pillar (s) depending on the potential of the chosen core areas of the specific country to alleviate fragility, especially in countries where fragility is deemed as the prevalent development challenge, ii) the focus areas of the Bank's measures and interventions will give a clear indication of ways to address the drivers of fragility in the proposed activities.		fostering responsible natural resources management, **Th.A - CB:** build and enhance capacity of the state and provision of support to effective institutions **Social:** social inclusion, gender equality, poverty reduction	development partners' concerns and interests. The Bank will use the RISPs for analysis and addressing of regional fragility issues. The country's specific needs and priorities and combination of instruments will be determined in line with the respective regional and country strategies The Bank will ensure mainstreaming fragility in country and regional documents and in the Bank's operations. The Bank will also conform its strategies, policies and financial or operational with fragile situations.		
Operational Guidelines for	**Th.A:** NA **Scope:** NA	NA	NA	NA		Bank instruments to facilitate private

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b. **Scope: Timeframe: short, medium, long term; Geographical: local, sub-regional, regional, national; Project phase: ideas, projects, programs and associated conceptualization/development**
c. **Sectorial (Sect.): Energy (E), Waste (W), Industrial processes (I), AFOLU, Transport (T), Water/Sanitation (W), Infrastructure Development (Inf), education (Edu), youth (Y), gender (G), poverty reduction (P)**

Report	Main message	Needs directly related to climate	Needs indirectly related to climate	Methodologies, underlying assumptions	Incomplete information	Notes
the Implementation of the Strategy for Addressing Fragility and Building Resilience in Africa and for the Transition Support Facility ORTS December 2014	**Sect.:** NA Categories of fragile states and countries and how to assess fragility (p.10) **Financial Instruments**: "project and program loans, grants, lines of credit, sovereign equity participations, guarantee instruments, **technical assistance, capacity building** and project preparation grants, are the primary financing instruments available to low-income regional member countries from the Bank Group's statutory (ADF, ADB and NTF) and non-statutory (bilateral and thematic trust funds, special funds, dedicated facilities, such as the TSF etc.) financing windows."					investments in fragile situations (p.20) Strengthening partnerships (global, regional, country, operations) (p.21) **Annex 3:** approach to scaling up AfDB's impact in fragile situations **Annex 5**: Multi donor trust funds **Annex 12** funding the FSF p.67
November 2013 - Progress report on the implementation of the Climate Change	**Sect. – W:** enhancing water resources supply, clean water resources and irrigation systems. **Scope:** medium, continental,	**Th.A – A** **Sect. – AFOLU:** increasing agricultural productivity and sustainability and food security - boosting incomes in rural areas - foster	**Cross-cutting among the three pillars of the CCAP: CB** - communication and awareness - institutional and policy reforms -	**NA** - What is the methodology used to determine the $175 billion for transport investment over the next decade??		The report stated that the existing investments in adaptation fall behind the planned targets in CCAP 2011-2015. Therefore, adaptation ought to be integrated in all the Bank's projects and programmes.

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b. **Scope: Timeframe: short, medium, long term; Geographical: local, sub-regional, regional, national; Project phase: ideas, projects, programs and associated conceptualization/development**
c. **Sectorial (Sect.): Energy (E), Waste (W), Industrial processes (I), AFOLU, Transport (T), Water/Sanitation (W), Infrastructure Development (Inf), education (Edu), youth (Y), gender (G), poverty reduction (P)**

Report	Main message	Needs directly related to climate	Needs indirectly related to climate	Methodologies, underlying assumptions	Incomplete information	Notes
Action Plan 2011–2015		engagement of community and raise knowledge on sustainable forest management - sustainable land use systems. **Th.A - M** **Sect. – E:** RE (clean energy), EE **Sect. – T:** sustainable transport **Sect. – T:** The Bank has reinforced partnership with other MDBs intending to invest **$175 billion** in sustainable transport throughout the next decade.	international cooperation and partnership – knowledge – tools and initiatives			3 pillars: 1. adaptation climate resilient development and building adaptive capacity, 2. low-carbon development, and 3. climate financing platform We might need to review the **Joint Multilateral Development Banks (MDB) report.** List of financial resources approved and to be channeled through the Bank (& contribution of each in UA million) & Bank hosted initiatives (**Annex 2& 3**)
AfDB CCAP 2016 – 2020	**Th.A – A - F:** special initiatives that support adaptation and climate resilience: AIRF, ABM, ARC, AAI, AAA, AHP, and AWF **Th.A – M - F:** special initiatives that support mitigation and low-carbon	**Th.A - A:** promoting investing in sustainable water resources management - boosting climate-resilient agriculture - sustainable	**Cross-cutting issues: Gender, capacity, fragility, health & education**	The selection process of mitigation and adaptation activities will take place via the use of tolls such as "the CSS and the tracking by AfDB sector and sub-sector codes".		There is a considerable gap between financing mitigation and adaptation, therefore adaptation is still a priority for the Bank.in this CCAP

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b. **Scope: Timeframe: short, medium, long term; Geographical: local, sub-regional, regional, national; Project phase: ideas, projects, programs and associated conceptualization/development**
c. **Sectorial (Sect.): Energy (E), Waste (W), Industrial processes (I), AFOLU, Transport (T), Water/Sanitation (W), Infrastructure Development (Inf), education (Edu), youth (Y), gender (G), poverty reduction (P)**

Report	Main message	Needs directly related to climate	Needs indirectly related to climate	Methodologies, underlying assumptions	Incomplete information	Notes
	development: AREI, NDEA, AGFF, SEforALL), Power Africa, EFI, AELG, FEI **Th.A - F:** information on key sources of climate finance: "(ADB/ADF resources, internal trust funds, external climate funds, scaling up private finance, leveraging market and results-based mechanisms, domestic resource mobilization, and the role of Regional Resource Centers)" **Scope:** medium, continental, ideas **Table 1 – p.16 (4 pillars of the plan & their alignment with the High 5s)** Indicative Results framework **(Annex 2)**	infrastructure for waste, water supply and sanitation, and health **Th.A – M:** fostering EE - scaling up RE investments – development of sustainable green infrastructure (for cooking energy, sustainable waste management and energy solutions) – boosting climate-smart agriculture and abatement of emissions from deforestation and forest degradation **Sect. – E, AFOLU, T, Inf, I, W, coastal zone waste, Tourism & Maritime**		Climate screening tools Climate Safeguards System (CSS)		The four pillars of this action plan that overarch its activities are: 1) climate-resilient development, 2) low-carbon development, 3) mobilizing financial resources and 4) enabling environments to address intercross (cross-cutting) issues, inter alia, technology development and transfer, capacity building, partnerships and networks and policies and institutional reforms About 85% of the mit. & adapt. Targets by the RMCs are conditional and depend on external financial and technical support

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b. **Scope: Timeframe: short, medium, long term; Geographical: local, sub-regional, regional, national; Project phase: ideas, projects, programs and associated conceptualization/development**
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COUNTRY STRATEGY PAPER 2015 – 2019 (Egypt) Published: Nov. 2015 [some information in this CSP regarding the country's context and situation is **outdated**]	The government emphasizes on sustainable and green development in its SDS2030 **Scope:** medium, local, ideas **Specificities incl. challenges:** **Sect. – W:** scarcity of water resources, water quality deterioration, sanitation issues especially in rural areas, ever-growing gap between demand and supply, problems of cross-sectoral and transboundary water allocation, and poor efficiency of water use and water systems. **Sect. – AFOLU:** water scarcity, lack of unconventional framing techniques, inefficient irrigation infrastructure and lack of developed value chains **Social**: youth unemployment, poverty, and gender inequality, especially in rural areas (e.g. upper Egypt)– disparity between urban and rural areas with higher poverty rate in rural areas – underdevelopment of the agriculture sector **Trade:** lack of regional integration; however, there is a particular focus to	**Th.A - M:** RE, EE – deployment of cleaner transport system **Th.A – A:** sustainable use of land and water endowments to promote food security – construction of more desalination and wastewater treatment facilities through PPP models - increasing efficiency of irrigation canals, drainage and water use – addressing sanitation and wastewater treatment in rural areas - more effective and efficient infrastructure and water systems to strengthen food security and green growth –	**Th.A – A:** Mainstreaming gender & youth in all projects **Th.A - CB:** strengthening the capabilities and capacities of governmental institutions – policy, regulatory and institutional reforms	National goals, priorities and challenges based on Egypt's SDS and the 5-year macroeconomic framework strategy Lessons learned from I-CSP (2011-2015)		Capacity building, institutional strengthening, and technology Ongoing portofolio in Egypt = 30 operations (**Annex 7**) Projects under this CSP will seek to create synergies with those planned under the North Africa RISP currently being drafted. **Annex 8** for indicative operation program 2016-2018) provides total budget for some projects (can be helpful in estimating similar projects costs) e.g. wind farm...

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b. **Scope: Timeframe: short, medium, long term; Geographical: local, sub-regional, regional, national; Project phase: ideas, projects, programs and associated conceptualization/development**
c. **Sectorial (Sect.): Energy (E), Waste (W), Industrial processes (I), AFOLU, Transport (T), Water/Sanitation (W), Infrastructure Development (Inf), education (Edu), youth (Y), gender (G), poverty reduction (P)**

Report	Main message	Needs directly related to climate	Needs indirectly related to climate	Methodologies, underlying assumptions	Incomplete information	Notes
	increase it especially with Sub-Saharan Africa. **Finance**: problems that hinder private sector development include insufficient access to infrastructure, limited educated workforce, corruption, policy instability, regulations of foreign currency and demanding requirements for access to finance – limited capacity of the banking sector to provide long term finance (<7 years maturity) – underdeveloped mortgage market – low financial inclusion **Political:** Egypt has exerted great efforts to fight radicalism and terrorism; however, some terrorism attacks have still been reported. **Two operational pillars:** 1. Infrastructure, and 2. governance for enhanced transparency, efficiency and fairness and increased private sector participation					
High5 – light up and power Africa + The New Deal (Brochures)	**Th.A – F:** Raise the ambitions for solving energy challenges in Africa through mobilization of financial resources and political will - 2. Set up a Transformative Partnership on Energy for Africa - 3. Mobilize and deploy	**Th.A – A & M:** providing universal access to energy will help communities adapt to CC impacts & if RE & EE	**Th.A – IA &CB:** 5. Reinforce energy regulatory framework, policy and sector governance in	**NA**		The reasons behind establishing the New Deal by the AfDB are to address the following problems to achieve the High5 goal of lighting up Africa: lack of

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c. **Sectorial (Sect.): Energy (E), Waste (W), Industrial processes (I), AFOLU, Transport (T), Water/Sanitation (W), Infrastructure Development (Inf), education (Edu), youth (Y), gender (G), poverty reduction (P)**

Report	Main message	Needs directly related to climate	Needs indirectly related to climate	Methodologies, underlying assumptions	Incomplete information	Notes
	local and international capital to innovatively finance the energy sector in Africa – 4. Promote the AfDB's energy investments and climate finance **Scope:** long term (2016 – 2025), continental, ideas **Sect. – E:** The main objective of the New Deal partnership is to achieve providing universal access to energy to over 645 million capita in Africa by 2025 through the consolidation of all energy initiatives. **Total Needs for universal access to energy:** additional amount of **$30 billion to $55 billion** required annually in domestic and international capital (which is more than the **$22.5 billion invested in the energy sector in 2015)**	technologies are used, they will result in GHG emissions reduction.	African governments.			adequate number of innovative bankable projects, lack of appropriate regulatory and policy frameworks, and absence of pricing incentives and coordination. Within the duration of 2016-2020, AfDB will invest about $12 billion and leverage around $50 billion in public and private investments in the energy sector. AfDB will also increase its climate finance to approximately **$5 billion annually** and leverage almost $20 billion to invest in climate adaptation and mitigation by 2020.
The Bank Group's Strategy for The New	Current investments = $23 billion (11% Private sector, 33% National govts, 56% MDB/DFIs), investment gap = $42-67 billion	**Th.A –M (A co-benefits):** Transition to a low carbon energy (RE systems,		This strategy was designed on consultations with African Countries,		The implementation of Africa's INDCs is anticipated to be at the value of $1.2 trillion. What

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Deal on Energy for Africa 2016 – 2025	**Scope:** long term (2016 – 2025), continental but achieving targets on country level, ideas **Sect. – E:** achieve providing universal access to energy to over 645 million capita in Africa by 2025 The New Deal works on seven strategic themes: **Th.A – IA - CB** 1. Establishing proper enabling policy environment, 2. Supporting utility companies by improving operations, restructuring, and providing technical assistance and CB, 3. Enlarging the number of bankable energy projects, 4. growing the funding pool needed for the delivery of new projects, 5. Underpinning the "bottom of the pyramid" energy access programmes, 6. Increasing significant regional projects and boosting integration, and 7. Leading energy transformation on country level.	more energy efficient appliances and technologies …), which is essential for combating CC and global sustainability. It will also help communities develop and adapt to CC impacts. (if sufficient climate financial support is available, Africa can transit to greener technologies in the energy sector by harnessing its renewable energy resources) **Th.A – F:** estimated to range from $65-90 billion annually over the next decade (2016-2025).		energy sector stakeholders, utilities, private investors, foundations and financiers. The investment needs will be prioritized by the Bank and other investors in accordance with the highest impact of the investment in respect of the overall number of beneficiaries (individuals and households) and other developmental impacts on the country and sub-original levels. Another criterion is to help countries increase the use of green energy systems and best practice energy efficiency technologies. The total population without access and the		is the methodology used to estimate and/or verify this number? Is there any reference? The New Deal will be supported by these five interconnected pillars: 1. Raise the ambitions for solving energy challenges in Africa through mobilization of financial resources and political will, 2. Set up a Transformative Partnership on Energy for Africa, 3. Mobilize and deploy local and international capital to innovatively finance the energy sector in Africa, 4. Reinforce energy regulatory framework, policy and sector governance in African governments, and 5. Promote the AfDB's energy investments and climate finance

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				percentage of population without access are key metrics to prioritise the wide range of countries. This accordingly divides the African countries into three groups (figure p.23)		the report states the reasons behind the investment gap and to how to address this gap (e.g. increasing governmental investments by removing subsidies and use about 2-3% only of the annual GDP; and promoting private sector investments) The New Deal will result in decoupling CO_2 emissions per unit of increase energy output by 2025
High 5 – Feed Africa Strategy for agricultural transformation in Africa 2016-2025 (high 5 feed Africa factsheet)	AfDB, multilateral and bilateral, public & private sector investments will fund $9 billion roughly of transformation of the priority agricultural commodities, hence the gap **will be $23-31 billion per year**. **Scope:** long term (2016 – 2025), continental, ideas **Specificities incl. challenges:**	**Th.A – A (M co-benefits if low-carbon technologies utilized):** multiply the gains of the agriculture sector and lead it towards a sustainable transformation for all lives with the inclusion of the most vulnerable and	**Th.A – CB:** Outcomes of the strategy that are beyond agricultural reforms encompass, inter alia, promoting **youth and women** engagement; reinforcing the **capacity of governments and multilateral**	The main seven fundamentals that will guide this strategy are: partnerships, leveraging the private sector, country ownership, development results and value added, sustainability and inclusivity, scaling, and business oriented		Key success stories: Brazil, Malaysia, and Vietnam (East Asia) The AfDB envisages to raise its investments in agricultural and agribusiness from $612 million in 2011-2015 to $2.4 billion per year henceforth.

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	Sect. – AFOLU – G – P: 60% of Africans live in rural areas and earn their livelihood from agriculture. Additionally, women comprises around 50% of the agricultural labor force in Africa. Despite this, the agriculture constitutes only 25% of the African GDP. Feed Africa Strategy is explicitly concerned with the disproportionate impacts of the climate variability and risks due to the high vulnerability of the continent to its repercussions particularly the agricultural sector and the Sahel area. This has resulted in the increase of food insecurity in many countries in Southern and East Africa. Therefore, the adoption, promotion and financing of climate-smart agriculture (CSA) is indispensable.	poorest population in Africa. **Th.A – F:** the transformation of 18 selected value chains is valued with $315-400 billion throughout 2015-2025 ($31.5-40 billion per annum).	**institutions, among others** to underpin this transformation; and promoting resilience against climatic changes and their adverse impacts.	approach to consider agriculture as a business rather than a 'way of life'. The focus of the strategy will be initially on critical value chains in accordance with the following prioritization criteria: "future demand, competitive advantage, scope for transformational uplift, potential to nourish Africa, and existing focus". The identified 17 "core" and "moderated" fragile states by the Bank will be paid special heed during the implementation of the strategy Estimates for hard and soft infrastructure		The groundwork for the realization of COP 21 ambitions and the correlated climate finance of $100 billion for adaptation in developing countries is directly related to emphasizing the development of resilient, sustainable and climate-smart agriculture. The implementation of the strategy will take place on three phases: "1. Initiate transformation (3 yrs), 2. Broaden and deepen transformation (3 yrs), and 3. Drive full transformation (4 yrs)".

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				entail estimates from rural roads referred to in FAO report "Achieving Zero Hunger: the critical role of investment: 2015".		
High 5 – Integrating Africa - Brochure	**Th.A – A:** The five key priorities of Integrating Africa will help the continent adapt to CC impacts, i.e.: 1. Expanding markets and prepare them to attract more investors, 2. Connecting landlocked countries with other regional and global markets, 3. Boosting the regional trade and investment in Africa, 4. Promoting private investments and know-how through the improvement of business environment, 5. Reaping the benefits from the free movement of people, cultures, information and ideas. **A**: Infrastructure for electricity access including renewable energy projects (**M** co-benefits); sustainable water resources management projects; expansion of rail, roads, ports and air links; telecommunications infrastructure to improve logistics and					Does Integrate Africa has a strategy? Is it published? No information on the financial needs for integrating Africa.

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	information flows; strengthen the business environment for regional, continental and global trade; enhancement and liberation of capital flows all over Africa to promote investments (all these areas can help in adaptation to CC) **Scope:** long term (2016 – 2025), continental, ideas					
High 5 – Industrialize Africa	**Th. A – A & M:** This can entail opportunities for mitigation projects (EE, RE, ..) and adaptation (provide livelihoods to vulnerable and marginalized population) **Sect. – I:** The strategy focuses on six leading programmes, which are: 1. Promoting effective industrial policies, 2. Fostering strategic partnerships in Africa, 3. Increasing liquid and effective capital markets, 4. Encouraging and driving development of enterprises, 5. Bolstering the development of industrial clusters across Africa, 6. Attracting and directing funds for industry and infrastructure projects					Is Industrialize Africa strategy 2016-2025 published? The Bank approved a minimum of $300 million loans in 2018 for projects with vast economic outcomes. (further information on loans for specific projects p.5-7) AfDB makes partnerships with other significant stakeholders such as UNIDO to expedite Industrialize Africa and to cooperate on joint activities in areas, inter

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Report	Main message	Needs directly related to climate	Needs indirectly related to climate	Methodologies, underlying assumptions	Incomplete information	Notes
	Scope: long term (2016 – 2025), continental, ideas					alia, eco-industrial parks, enterprise development, access to finance, innovation and technology investments, circular economy, and agro-industry development
High 5 – Jobs for Youth in Africa – Strategy for creating 25 million jobs and equipping 50 million youth 2016-2025	The strategy particularly targets youth in fragile states and post-conflict zones, which are among the most affected population by CC impacts. The strategy also sheds the light on the reduction of gender inequality in the labor market. Flagship programmes in priority sectors: ICT, industry and agriculture) The strategy's main objective is to create about 25 million jobs for youth and to equip them with the necessary skills having positive impacts on 50 million youth over the next decade. The strategy will achieve this through promoting entrepreneurship, inclusive employment, enhancing human capital, and developing strong labor market by intervening in three strategic aspects, which are innovation, investment and integration.	**NA**	**Th.A – A:** creating jobs for youth and improving their lives, while supporting other priority areas with **A** and **M** co-benefits such as **AFOLU, E, regional integration, and I**.	Anchored in the Bank's Ten Year Strategy (2013-2022), Human Capital Strategy (2014-2018), and other High 5 priority areas. It also builds on lessons learned from previous experiences (including the efforts of MDBs, philanthropic foundations, RMCs, and civil society among others) and initiatives such as the Joint Youth Employment Initiative for Africa, and best practices. The strategy is based on consultations with various stakeholders, inter alia civil society,		there are **20-page program models** supplemented with details on the key components of the flagship, the Bank's role and the role of other partners, implementation schedule, estimated **costs and impacts** and analogues of relevance from the Bank's and external partners' projects. Jobs for Youth in Africa Facility (a special fund that will pool resources from the Bank and similar donors and focus on youth employment The Bank approved 56 education projects,

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	Scope: long-term (10 years) **Specificities incl. challenges:** **Sect. – Y:** The youth population in Africa is anticipated to reach over 830 million by 2050. However, this can foster the inclusive economic growth across Africa and increase productivity if properly leveraged. Only 3 million formal jobs are provided every year, whilst 10-12 million youth join the workforce annually.			and public private, and youth groups and informed by crucial global and regional agreements such as African Youth Charter, Agenda 2063, Malabo Declaration, and Ouagadougou Declaration.		amounted $1.6 billion, across Africa. About 34% of this amount was allocated to Technical Vocational Education and Training (TVET). Activities will be financed by three funding sources, which are the Jobs for Youth in Africa Facility, cost sharing for flagship programmes and other sources of funding (the Bank will pool resources from other private, public, and philanthropic organizations). Youth employment will be incorporated in CSPs and RISPs to guarantee that the Jobs for Youth in Africa is considered in country level programmes. The Bank's target in 2030 is to reach $1.4 billion additional financing made available to businesses

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						through , Sinvestment activities (Annex 1)
High 5 – improve quality of life progress report (2018)	The focus is on two enablers, i.e. inclusive social and financial systems and inclusive growth. **Scope:** long-term (10 years), continental	**Th.A – A & F:** it is estimated that about **$13 billion** is needed annually to fulfill the SDG target of universal access to **water supply and sanitation**.	**Th.A – A:** The Bank's aim is to harness the capabilities of 1 billion Africans through developing skills and boosting technologies to create better jobs.			p.7 & 8: about the funds that the Bank provided to some countries to help them improve the quality of life (however no much information on specific projects).
GCF – Funding Proposals – Democratic Republic of Congo (DRC) Green Mini-Grid Program (Nov. 2018)	**Th.A – F:** Total cost of the 3 projects = $87 million (at commercial operation date COD) ($1 million grant for technical assistance to scale up the green mini-grids across the country) (avoiding 560,000 tCO_2eq over 20 yrs, 28,000 tCO_2eq annually) Energy sector (mini-grid solutions) estimated cost per tCO_2eq = $155/t CO_2eq (GCF share = $36/t CO_2eq) (expected co-financing ratio = 1:3.35) Targets (18.5 MW solar PV with battery installed)	**Th.A – M:** Approved project to deliver clean energy to the towns of Isiro, Genema and Bumba in DRC, which are currently off the grid, through financing three solar hybrid mini-grid model. Each comprises a hybrid photovoltaic power plant (5 -10 MW), battery storage and distribution networks for delivery to consumers.				Congo's target to reduce GHG emissions as per their NDCs is 17% by 2030 at an estimated cost $12.54 billion (about 10 $MtCO_2eq$/year through renewable energy). The total market, for mini-grid solutions assuming that it will serve million people, with mini-grid and off-grid solutions is estimated at $921 million per year. (Risks: market risk, political risk)

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	Sect. – G: 30% women out of 40 key institutions officials trained on green mini-grid development and management. 30% women out of 50 private developers trained on green mini-grid development and management. **Scope:** Program and associated conceptualization/development **Specificities incl. challenges:** **Sect. – E:** Since the country mainly depends on hydropower, electricity generation is highly vulnerable to climate change impacts. Barriers to expand energy sector investments in DRC: financial situation of the country, weak regulatory systems, and political risk that discourages the private sector to invest, and limited availability of technology and business models for off-grid solutions as they are not fully-fledged yet globally. Only about 10% of the population in DRC has access to electricity and is one	**Th.A – A co-benefits:** since energy access will enhance the social and economic resilience of low income communities in highly vulnerable areas to climate change.]				

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	of the countries with lowest electrification rates worldwide. **Sect. – F:** DRC faces challenges in the financial markets: high inflation rates, high interest rates, low financial intermediation, most credit is informal, low formal bank credit to private sector (<3% of GDP), few borrowing options for SMEs, weak legal system that hinder long term loans					
FP093: Yeleen Rural Electrification Project In Burkina Faso through a private sector driven Green Mini Grid model (2018)	**Th.A – F:** Total project financing = **53.1 MEUR,** Requested GCF amount (Grant + Loan + Guarantee) **= 24.3 M EUR,** Expected lifetime emission reductions overtime **= 390 000 tCO_2eq,** Estimated cost per tCO_2eq = **136 EUR / tCO_2eq,** **(Mini grid characteristics: 11 MW solar PV mini-grid, 332,558 MWh delivered over 25 year life-time)** Co-financing of project cost **= 54.2%** The capital cost of the mini-grid kWp is estimated as **5000 $/kWp (4,310 EUR/kWp) all inclusive** (i.e. generation, transmission and distribution infrastructure). The	**Th.A – M:** Approved project to deliver clean energy Target Capacity of installed PV systems = 11.4 MWp **Th.A – A co-benefits:** the project will help in increasing the resilience of the agriculture sector and rural population by developing a sustainable model for rural electrification that will enable them to access irrigation,		"financial modelling is based on the cost-reflective tariffs, up to a ceiling of 0.40$/kWh (c. 34 EUR/kWh)."		Key risks P. 65 Project components: review and restructuring regulatory, legal and institutional framework for a rural electrification model to enhance sustainable rural energy access funded by private developers, installing 100 mini-grids powered by solar PV (estimated as 11.4 MWp), providing efficient equipment to uphold economic activities in the targeted regions (100 rural localities)

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	operation costs are amounted as **2.5** % of capital costs. **The financial projections have been carried for a period of 15 years as per the concessional loan terms.** **Sect. – G:** 30% **Scope:** Program and associated conceptualization/development **Specificities incl. challenges:** **Sect. – E:** Access rate to energy in the country is lower than the average in Africa (18.8% compared to 40%) and with higher cost price per kWh. Albeit most population live in rural areas, the urban and rural electrification rates are 59.9% to 3.1% respectively, which represents a hurdle that obstruct the development of the rural environment and agricultural sector. Barriers to rural electrification: institutional, policy, regulatory, technical and financing barriers (p.19)	provide sustainable livelihoods, and eradicate poverty. It will also help Burkina Faso as a landlocked country to adapt to climate change impacts and recover from political and social instability.				
FP092 - Programme for Integrated Development and	**Th.A – F:** Total cost **$209.003 million** (C1. Development of ecosystems and natural resources resilience = 86.219, C2. Development of population resilience = 102.603, C3. Programme	**Th.A – A:** enhancing the resilience of natural and human systems in the Niger Basin against CC,				Theory of change diagram p.53 Risks p.68

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Adaptation to Climate Change in the Niger Basin (PIDACC/NB) (2018) (Multiple countries sharing the Niger Basin in conflict and highly vulnerable zones)	coordination and management = $21.081 million) GCF share = 67.774 (loan = 10, grant = $57.774 million) The programme entails construction of small hydro-agriculture infrastructure, development of transhumance pathways infrastructure and water points for cattle, and community based livelihood infrastructure. Co-financiers: AfDB, EU, GEF, and beneficiaries (countries) **Scope:** Program and associated conceptualization/development **Specificities incl. challenges:** **Sect. - Cross-cutting** The existing barriers to climate adaptation in the Niger Basin are: 1. Insufficient climate risk information, 2. low adaptive capacity, 3. lack of adequate financial resources for climate adaptation, 4. policy and institutional barriers, 5. Uncertainty around magnitude and timing of future impacts of CC.	climate variability and associated risks. Increased resilience of health & well-being and food and water security, ecosystem and ecosystem services **Th.A – M co-benefits:** less emissions from forestry and other land use (around 1.4 million tCO_2 annually, 7 million t CO_2 during the project lifetime) due to the sustainable forest and soil management by developing 40,000 ha of forests and building capacity of 200 members of community associations in REDD+.				

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FP080: Zambia Renewable Energy Financing Framework (2018	**Th.A – F:** **Total project financing** = $154 million (GCF share = $52.5 million, 2.5 grants, 50 senior and standby loans) **Estimated cost per tCO_2eq** $37.58 / **$tCO_2eq$** (total project financing = 150 million $ (excluding $4 million grants for TA) **Scope:** Program and associated conceptualization/development **Specificities incl. challenges:** **Sect. – E:** Electrification rate in the country = 27.9% (about 90% hydro power) Nearly 1.8 million rural households and 500,000 urban households do not have access to electricity at the present time. Key challenges in energy sector in Zambia (p.16, p.17) (explains implications of unbalanced energy mix & justifies why RE projects are essential for the country) Theory of change diagram p.43	**Th.A – M:** reduction in GHG emissions due to the increase of RE share in the energy mix, and lessening the use of firewood and charcoal in cooking as a result of the increase in electricity stability, which in turn leads to less deforestation and land use change. **Total reduction in emissions** = (159,677.28 tCO_2eq annually, and 3.9 million tCO_2eq)				One of the key barriers for renewable energy projects funding in various Sub-Saharan African Countries is the insufficient private financing and the short tenor (5-7 years from local commercial investors) Zambias's NDC needs: total cost of implementation = $50 billion by 2030, $35 billion from external sources, and $15 billion will be mobilized domestically. Risks p.58

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Departmental Annual Reports						
Bridging the Gap For Africa's Transformation – Trust Fund Annual Report 2018	Funding priority areas: Infrastructure work as pre-requisite to achieving SDGs, high 5's, and Climate resilience. Trust cumulative Funds: 70% TTF (20 Funds), 12% BTF(16), and 16% other funds (6). It is also coupled with Institutional Capacity strengthening as a supplementary priority area. There is an increase in amount of mobilized funds each year (UA 1072m in 2018 compared to UA 1015m). Funds for 108 projects were approved in 2018 Co-financing has significantly leveraged the Bank's resources	**Th.A:** • Mitigation projects (M) • Adaptation and Resilience projects with emphasis on fragile states (A) thematic Funds directly related to CC: 7 (F) **Scope:** Projects are more focused on national and sub-regional needs than regional. short-medium term (3-5 years) **Sectors:** **Mitigation:**	Th.A: Thematic Funds indirectly related to CC: 5 (FF) "Other" Funds related to CC: 2 **Reported project areas:** Infrastructure (inf) Gender Equality (G) Youth Unemployment (Y) Capacity strengthening (Inst Arr)	No processes or methodologies reported on identifying needs or priority areas. Basis for Funds mobilization: Bridging the total *infrastructure* financing gap estimated at $68 to 108 billion per year in Africa	Gaps: • Processes and methodologies in identifying the need for new Trust Funds • Processes and methodologies in identifying programmes or projects • Process, methodology, and assumptions for estimatin	Project portfolio of the Bank's Trust Funds are inclined towards the more fragile states. infrastructure work is needed the most in such countries to build resilience prior to further climate-focused projects More resilience building-based programmes and projects have been approved and reported from the different Trust Funds Creating the suitable environment for the report states that technical/Technological Innovation is needed to support the social and economic sustainable development

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b. **Scope: Timeframe: short, medium, long term; Geographical: local, sub-regional, regional, national; Project phase: ideas, projects, programs and associated conceptualization/development**
c. **Sectorial (Sect.): Energy (E), Waste (W), Industrial processes (I), AFOLU, Transport (T), Water/Sanitation (W), Infrastructure Development (Inf), education (Edu), youth (Y), gender (G), poverty reduction (P)**

Report	Main message	Needs directly related to climate	Needs indirectly related to climate	Methodologies, underlying assumptions	Incomplete information	Notes
		• Energy infrastructure (E); **Adaptation:** • Agriculture infrastructure (AFOLU) • Followed by Social and rural development) (SD); **Capacity building:** • institutional Strengthening projects (Inst. Arr) Top priority areas receiving funds from the thematic trust funds pool: 1. Renewable energy (31% of total investments) (E) 2. Infrastructure (airports,			g the infrastructure financing gap • Does the reported gap account for climate-proofed investments?	in Africa (relevant to identifying needs) fulfilling funds for project preparation and capacity building remains a major challenge (additional financing gap that is not quantified but stated as clear gap in the report)

a. **Thematic area (Th.A): Adaptation (A), mitigation (M), financial (F), Technical/Technological (TT), Institutional arrangements (IA), Capacity Building (CB)**
b. **Scope: Timeframe: short, medium, long term; Geographical: local, sub-regional, regional, national; Project phase: ideas, projects, programs and associated conceptualization/development**
c. **Sectorial (Sect.): Energy (E), Waste (W), Industrial processes (I), AFOLU, Transport (T), Water/Sanitation (W), Infrastructure Development (Inf), education (Edu), youth (Y), gender (G), poverty reduction (P)**

Report	Main message	Needs directly related to climate	Needs indirectly related to climate	Methodologies, underlying assumptions	Incomplete information	Notes
		roads, etc) (22%) (inf) 3. Water and sanitation (18%)(W) 4. Private sector development (12%) (F) 5. Power (5.5%) (E) 6. Social (3.2%) (S) Climate finance projects (approved) only consistuted 0.52% of the trust funds pool Priority areas receiving funds from Bilateral funds pool: 1. Multisector (40%) 2. Agriculture (35%) (AFOLU)				

a. **Thematic area (Th.A): Adaptation (A), mitigation (M), financial (F), Technical/Technological (TT), Institutional arrangements (IA), Capacity Building (CB)**
b. **Scope: Timeframe: short, medium, long term; Geographical: local, sub-regional, regional, national; Project phase: ideas, projects, programs and associated conceptualization/development**
c. **Sectorial (Sect.): Energy (E), Waste (W), Industrial processes (I), AFOLU, Transport (T), Water/Sanitation (W), Infrastructure Development (Inf), education (Edu), youth (Y), gender (G), poverty reduction (P)**

Report	Main message	Needs directly related to climate	Needs indirectly related to climate	Methodologies, underlying assumptions	Incomplete information	Notes
		3. ICT (14%) (TT) 4. Water (8%) (W) 5. Energy (2%) (E) 6. Governance (1%)(Inst Arr)				
Climate Change and Green Growth - 2018 Annual Report	The Bank's pipeline of high quality projects currently exceeds the funding envelope available by the Bank, hence more funding sources are needed (mobilizing private sector support and attracting other global financial resources). Mainstreaming climate change into all Bank operations, and countries' national strategies is one of the Bank's ways to improve access to climate finance	**Thematic area related to Climate Change:** Mitigation ($1.62 billion) (M) Adaptation and Resilience ($1.6 billion) (A) Climate Finance ($3.27 billion) (F) **Scope:** Multi-national and national. Short to medium-term **Sectors:** **Mitigation:** Energy infrastructure (E)	Capacity strengthening (Inst Arr) Technical/technological assistance (ICT) (TT) Policy, Institutional, and Organization Reforms (Inst Arr) Engaging women and youth in Climate Change (G) (Y)	No methodologies are presented in this annual reports. It presents achievements and new additions to projects portfolio	Gaps: Procedural/technical: Processes/methodologies on how all Bank operations will align with the Paris Agreement by 2020; Policy: status of developing a Climate Change Policy that strategically guides implementation of	collaboration will include the development of an Africa Green Growth Index Multi-national projects include countries from different African regions. This shows that needs are not necessarily based on only geographic location, but also socio-economic factors. the Bank nearly achieved parity between adaptation (49%) and Mitigation finance (51%), a 19% increase compared

a. **Thematic area (Th.A): Adaptation (A), mitigation (M), financial (F), Technical/Technological (TT), Institutional arrangements (IA), Capacity Building (CB)**
b. **Scope: Timeframe: short, medium, long term; Geographical: local, sub-regional, regional, national; Project phase: ideas, projects, programs and associated conceptualization/development**
c. **Sectorial (Sect.): Energy (E), Waste (W), Industrial processes (I), AFOLU, Transport (T), Water/Sanitation (W), Infrastructure Development (Inf), education (Edu), youth (Y), gender (G), poverty reduction (P)**

Report	Main message	Needs directly related to climate	Needs indirectly related to climate	Methodologies, underlying assumptions	Incomplete information	Notes
		Adaptation: • Agriculture infrastructure and development (AFOLU) • Water and sanitation (W) • Transport (T) **Capacity building:** Governance (Inst Arr)			High Five Agenda, AU Agenda 2063, and SDG	to 2016, showing growing demand and need for adaptation fund mobilization from all African Countries, besides mitigation funds and not instead of it.
Infrastructure and Urban Development Annual report 2019	19 projects in Infrastructure and Urban Development were financed by the Bank in 2018 (worth $1.6 billion), compared to 16 in 2017 and 14 in 2016. 2018 portfolio focused on East Africa (30% of total investments), followed by Southern Africa at 12%, Central Africa at 7% and Northern Africa at 5%. The Bank committed	**Th.A:** **Mitigation** (reducing transport related emissions) (T), and **Adaptation** (improving air quality and urban mobility networks) (SD)	Sectors: **Infrastructure development (inf)** 12 **Road projects** (22% of total investment in 2018) (T) **2 Airport projects** (11%), (T)	No methodologies stated. Basis for projects development: implementation of Integrate Africa (one of the high5s)	• Which projects are climate-proofed? • If so, does the reported costs of the projects include	infrastructure and urban development project approvals accounted for 21% of the Bank's total portfolio in 2018 These projects are cross-cutting and interlinked with CC challenges and goals.

a. **Thematic area (Th.A): Adaptation (A), mitigation (M), financial (F), Technical/Technological (TT), Institutional arrangements (IA), Capacity Building (CB)**
b. **Scope: Timeframe: short, medium, long term; Geographical: local, sub-regional, regional, national; Project phase: ideas, projects, programs and associated conceptualization/development**
c. **Sectorial (Sect.): Energy (E), Waste (W), Industrial processes (I), AFOLU, Transport (T), Water/Sanitation (W), Infrastructure Development (Inf), education (Edu), youth (Y), gender (G), poverty reduction (P)**

Report	Main message	Needs directly related to climate	Needs indirectly related to climate	Methodologies, underlying assumptions	Incomplete information	Notes
	$1.9billion in 2018 to projects, compared to $1.5 billion in 2017 and $1.6 billion in 2015	**Scope**: National (Cote D'Ivoire, Burundi, Tanzania, Mali, Cameroon, Gabon, Cape Verde) and Regional projects dominate the 2018 portfolio (East Africa and Southern Africa)	2 Urban Development projects (SD) 2 **port** projects in Gabon and Cape Verde (inf) 6 of the 19 projects address women and youth issues in the projects' main outputs **(G) (Y)** 4 of the 19 projects include technical capacity building as their main outputs **(TT) (Inst Arr)** Data and Knowledge production on emissions, adapdation, impacts of CC, and social development **(TT)**		climate-proofing costs? Methodology for Identifying viable investment opportunities and developing project pipelines	
CIF annual report 2019	Meeting the needs of African countries exceed the capacity of the Bank alone, or any single donor or investment	Thematic areas: **Mitigation (M)**	Infrastructure development (energy, water,	No methodologies stated in the report.	Gaps: • Processes and	The AfDB and CIF are committed to promoting new and innovative

a. **Thematic area (Th.A): Adaptation (A), mitigation (M), financial (F), Technical/Technological (TT), Institutional arrangements (IA), Capacity Building (CB)**
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c. **Sectorial (Sect.): Energy (E), Waste (W), Industrial processes (I), AFOLU, Transport (T), Water/Sanitation (W), Infrastructure Development (Inf), education (Edu), youth (Y), gender (G), poverty reduction (P)**

Report	Main message	Needs directly related to climate	Needs indirectly related to climate	Methodologies, underlying assumptions	Incomplete information	Notes
	alone. The needs will only be fulfilled through collaboration and partnerships between different stakeholders and organizations on regional and global levels (co-financing). The partnerships improves access to finance. Mainstreaming CC into programs and project proposals facilitates access to financing options, including co-financing CIF portfolio focuses on Energy (CTF and SREP funds), Forestry (FIP), Agriculture (PPCR) **Number of country-specific CIF Investment plans endorsed and with funding allocation: 25** **Number of endorsed investment plans WITHOUT funding allocation: 11 (highlights a clear financing gap)**	**and Adaptation (A), and capacity building (Inst Arr)** **Scope**: mostly Short-term national, along with some multinational **Sectors** in order of amounts invested so far: Energy (**mitigation**) (E) Agriculture (**adaptation**) (AFOLU) Transport (**cross-cutting**) (T) Finance (**cross-cutting**) (F) MultiSector (**cross-cutting**) Water (**adaptation**) (W) AfDB's 2019 climate finance reached total	forestry, agriculture) (inf) Technical/technological assistance (ICT) (TT) Gender responsive climate action (G) Innovation for climate-resilient development (TT)	rationale for the investment programs and projects: mobilizing new and additional public and private sector finance to enhance climate change action on both adaptation and mitigation. The reports sets indicators for assessing progress: • Installed capacity • People supported to cope with CC effects • People benefiting from improved livelihoods	methodologies in identifying programmes or projects • Methodologies and assumptions on determining the ratio/percentage of mitigation/adaptation funding • Processes and methodologies in identifying external funding	approaches in Africa to close the adaptation/mitigation financing gap. Projects are focused more on Eastern, Central and Western Africa and few parts of Southern, and Northern Africa CIF targets for energy sector based on 2018 projects: **Renewable Energy installed capacity** Implemented: 710 MW Target: 3,502 MW **Gap: 2792 MW** **CC adaptation** People with improved support to cope: 322,378 from 5 projects (53% women) Target: 1,720,000

a. **Thematic area (Th.A): Adaptation (A), mitigation (M), financial (F), Technical/Technological (TT), Institutional arrangements (IA), Capacity Building (CB)**
b. **Scope: Timeframe: short, medium, long term; Geographical: local, sub-regional, regional, national; Project phase: ideas, projects, programs and associated conceptualization/development**
c. **Sectorial (Sect.): Energy (E), Waste (W), Industrial processes (I), AFOLU, Transport (T), Water/Sanitation (W), Infrastructure Development (Inf), education (Edu), youth (Y), gender (G), poverty reduction (P)**

Report	Main message	Needs directly related to climate	Needs indirectly related to climate	Methodologies, underlying assumptions	Incomplete information	Notes
		of $3.6 billion (35% of all Bank approvals) AfDB aims to mobilize $25 billion as climate finance during 2020-2025 Adaptation/mitigation financing parity was almost reached in 2018 (55% / 45% respectively) 64% of investments came from public funds, and 36% from private sources 17% of finance sources were external, and 83% were internal. CIF is the biggest external investment source ($57 million), followed by GEF ($54 million), and GCF ($20 million)			needs from outside the Bank or its partners •	**Gap: 1,397,622 people need resilience building ($$?)**

a. **Thematic area (Th.A): Adaptation (A), mitigation (M), financial (F), Technical/Technological (TT), Institutional arrangements (IA), Capacity Building (CB)**
b. **Scope: Timeframe: short, medium, long term; Geographical: local, sub-regional, regional, national; Project phase: ideas, projects, programs and associated conceptualization/development**
c. **Sectorial (Sect.): Energy (E), Waste (W), Industrial processes (I), AFOLU, Transport (T), Water/Sanitation (W), Infrastructure Development (Inf), education (Edu), youth (Y), gender (G), poverty reduction (P)**

Report	Main message	Needs directly related to climate	Needs indirectly related to climate	Methodologies, underlying assumptions	Incomplete information	Notes
		For every $1 invested by the CIF, additional $15 has been mobilized total of $280 million will be available through CIF to support projects in 2019 (no mention whether this reduces the financing gap) estimated $300-400 billion of annual resources is required to preserve natural capital				

Annex 3 - For Consideration of Case Studies

For Western Africa -RISP and Central Africa-RISP, operational program explicitly includes climate and environment and can serve as potential case studies.

Country Strategy Paper (2015 – 2019) – Egypt

Egypt's CSP is aligned with the Bank's 10-year strategy, SDS2030, the 5-year Macroeconomic Framework Strategy (MFS) and the new Cabinet comprehensive reform program. The Bank aims to help Egypt sustain its economic recovery through reinforcing their partnership.

Climate change is one of the challenges that the country faces and it is mentioned explicitly in the CSP. Also, the government emphasizes on sustainable and green development in its SDS2030.

The paper focuses on two operational pillars, i.e. 1. Infrastructure, and 2. Governance for enhanced transparency, efficiency and fairness and increased private sector participation

Thematic Area

Mitigation: Energy: Renewable Energy and Energy Efficiency, Transport: deployment of cleaner transport systems

Adaptation (might include Mitigation co-benefits):

- AFOLU: To strengthen the agriculture sector, the Bank will support the provision of more effective and efficient infrastructure and water systems to strengthen food security and green growth, sustainable use of land and water endowments to promote food security;
- Water and Sanitation: The Bank will particularly uphold efforts to address water issues such as 1. Water quality deterioration and sanitation, especially in rural areas, 2. The ever-growing gap between demand and supply, 3. The problems of cross-sectoral and transboundary water allocation, and 4. Poor efficiency through:
    - Construction of more desalination and wastewater treatment facilities through PPP models, increasing efficiency of irrigation canals, drainage and water use, addressing sanitation and wastewater treatment in rural areas, more effective and efficient infrastructure and water systems to strengthen food security and green growth;
- Gender & Youth: Mainstreaming gender and youth in all projects

Capacity Building: strengthening the capabilities and capacities of governmental institutions; policy, regulatory and institutional reforms.

Scope

This paper is medium term local level document.

Financial Needs

No quantitative information on the financial needs are reported in this document

Financial Resources and Instruments

Project loans, grants, PBOs in addition to newly added innovative instruments, e.g. guarantees

AfDB will be the main source of fund for the proposed operations from both its private sector and public sector windows.

Initiatives and Partnerships

Examples for development partners in Egypt are UNDP, WB, EBRD, EIB, USAID, EU, JICA, IsDB, OFID and AfDB.

Annex 4 - Past Projects and Operations

The financial models, unit cost, or estimated investments in past projects and operations can form a basis for the estimation of analogous costs and needs for mitigation and adaptation projects in other regions or countries with similar conditions. Additionally, some lessons learned can be extracted from the experiences gained in the preparation and implementation of those projects to enhance the financing environment and alleviate financial risks in the African countries. It also provides an overview of the focus areas or scope of some funds and/or multilateral organizations that can be useful in determining the eligible sectors or projects for climate finance.

The following sections wrap up the highlights of some relevant projects documents and reports:

GCF Approved Proposals

The GCF has supported different projects in various sectors across Africa.

In the agriculture sector, GCF approved a “Program on Affirmative Finance Action for Women in Africa (AFAWA): Financing Climate Resilient Agricultural Practices in Ghana”. The purpose of the project is to support agribusiness owned by women. The project presents a financing mechanism to relieve the financing challenges in the sector: Ghana Incentive Based Risk Sharing System for Agricultural Lending (GIRSAL) as an approach to reduce a key challenge: perceived high investment risk resulting in disincentives from local FI/commercial institutions. The GIRSAL can serve as an approach for implementation elsewhere to improve financing environment for growing high investment risk sectors such as agriculture. The reported costs of risk sharing financing mechanism

(e.g., GIRSAL) in the proposal can be used as basis to estimate costs of similar programs in other countries.

Another programme, named “Integrated Development and Adaptation to Climate Change in the Niger Basin (PIDACC/NB), aims at enhancing the resilience of natural and human systems in the Niger Basin against climate change, climate variability and associated risks. The programme will strengthen the resilience of health and well-being, food and water security, ecosystem and ecosystem services. Furthermore, it will result in less emissions from forestry and other land use (around 1.4 million tCO_2eq annually, 7 million tCO_2eq during the project lifetime) due to the sustainable forest and soil management by developing 40,000 ha of forests and building capacity of 200 members of community associations in REDD+. The total cost of the project is $209,003 million.

Since energy access has been a nuisance in several African countries, there are two programmes for green mini-grid systems in Democratic Republic of Congo (DRC) and Yeleen in Burkina Faso in addition to another energy related project in Zambia for a renewable energy financing framework.

The goal of DRC’s programme is to deliver clean energy to three towns, which are currently off the grid, through financing three solar hybrid mini-grid model. The programme target is to install 18.5 MW solar PV with battery. The project will mainly result in Mitigation of GHG emissions. It will also have some Adaptation co-benefits since energy access will enhance the social and economic resilience of low income communities in highly vulnerable areas to climate change. Moreover, the project has a component that is concerned with capacity building and technical assistance. The total cost of the 3 projects equals $87 million. The energy sector (mini-grid solutions) estimated cost per tCO_2eq in this project is $\$155/tCO_2eq$. Those units can be used to estimate costs for similar projects.

Whilst, Yeleen rural electrification project aims at delivering clean energy with a target capacity of installed PV systems equals to 11.4 MWp. The project will culminate in mitigation of GHG emissions (Expected lifetime emission reductions overtime = 390,000 tCO_2eq) with some adaptation co-benefits. The project will help in increasing the resilience of the agriculture sector and rural population by developing a sustainable model for rural electrification that will enable them to access irrigation, provide sustainable livelihoods, and eradicate poverty. It will also help Burkina Faso as a landlocked country to adapt to climate change impacts and recover from political and social instability. The project also incorporates technical assistance activities to strengthen the sector institutions with about 30% women (Gender) trained. Total project financing is equivalent to EUR 53.1 million = $61.065 million (1 Euro = $1.15, as of 2020), while the estimated cost per tCO_2eq = EUR 136 / tCO_2eq (Mini grid characteristics: 11 MW solar PV mini-grid, 332,558 MWh delivered over 25 year life-time). The capital cost of the mini-grid kWp is estimated as $5000kWp (EUR 4,310 /kWp) all inclusive (i.e. generation, transmission and distribution infrastructure). The operation costs are amounted as 2.5 % of capital costs. The financial

model of this project depended on the cost-reflective tariffs, with a ceiling up to 0.40 $/kWh (`34EUR/kWh).

Zambia Renewable Energy Financing Framework will result in reduction of GHG emissions due to the increase of renewable energy share in the energy mix, and lessening the use of firewood and charcoal in cooking. The total reduction in emissions amounts to 159, 677.28 tCO_2eq annually, and 3.9 million tCO_2eq over the programme lifetime. This will occur as a result of the increase in electricity stability, which in turn leads to less deforestation and land use change. The programme will also entail capacity building and technical assistance as well as adaptation co-benefits due to access to energy, diversification of the energy mix and including more sustainable energy resources. The total project financing is $154 million (including $4 million grants for TA) and estimated cost per tCO_2eq is $37.58 / tCO_2eq.

AfDB-GEF Annual Report 2018 and 2016

The review of the AfDB-GEF partnership brochure 2018 showed that the focus of the GEF is on large-scale projects ($10 million and above) with mutual mitigation and adaptation benefits. Eastern and Western Africa received more project approvals and funding from the GEF. This may be justified by their higher vulnerability, compared to other African regions, to effects of climate change in both low and high global warming scenarios as stated in the Climate Change Impacts on Africa's Economic Growth report 2018.

The main thematic areas are:

- Mitigation: projects in 8 countries (47% of total investments)
- Adaptation: projects in 17 countries (34.5%).
- Mitigation/Adaptation co-benefits: projects in 8 countries
- Poverty reduction, education, and health issues are identified as priority social development areas that can have adaptation and resilience co-benefits.

One of the GEF approved projects in Lesotho was designed to contribute to the implementation of the Bank TYS long-term strategy through capacity building, strengthening monitoring and evaluation both at Project and sector levels, and enhancing service delivery models for rural water supply and sanitation. The estimated cost for the preparation of technical/feasibility study for assessment of climate impact and adaptation options is $30,000 per unit/study. The cost per unit for identification and installation of climate resilient water supply technology – for example boreholes of appropriate depth, rainwater harvesting and diversification of resources is $25 thousand ($1.5 million total for 59 units). Moreover, the cost for installation of hydro-meteorological stations / rain gauges for long-term monitoring to collect quality information and for early warning is $21,500 per unit.

Another project in Zambia for Climate Resilient Livestock Management was developed based on national vision 2030 and in line with regional prioritization for agriculture as key

sector for sustained economic growth. It also aligns with the Bank's TYS and Feed Africa high5. The project aims to facilitate both climate change adaptation and mitigation outlook to the on-going Livestock Infrastructure Support Programme (LISP)-supported activities. The project reports its contribution to job creation to foster poverty reduction as co-benefits that are indirectly related to CC resilience and adaptation. Yet, they were not reported against predetermined targets or quantified needs.

SEFA Reports

The Sustainable Energy Fund for Africa (SEFA) was established in 2011 to focus on supporting Africa's energy sector in order to address the challenges of low-electrification rates (almost 60% of Sub-Saharan African population have no access to power), and high costs of power generation that impede sustainable development and economic growth in the continent. SEFA provides support to small- to medium-scale renewable energy and energy efficiency projects, with the goal of attracting the necessary investment and reaching financial close. It received a cumulative total of UA 74.4 million ($102.6 million) since its launch. SEFA portfolio for 2017 for 3 components: Project preparation grants, Equity investments, and Enabling environment.

The Sustainable Energy Fund Africa (SEFA) portfolio includes short-term renewable energy infrastructure projects. Majority of these projects are national projects (cumulative total of 37 projects), besides some multinational projects (cumulative total of 9 projects). Projects in 20 countries have been approved so far with focus on Eastern Africa (44% of portfolio), Southern Africa (18%), and Central Africa (15%).

31% of projects were hydro-energy, 35% policy projects, 8% geothermal energy projects, 7% wind energy projects, and 5% solar PV.

In the SEFA Annual Report 2017, it was stated that the SEFA Secretariat screened 138 project preparation funding requests in 2017 only 38 of which were considered eligible. About two thirds of the applications were rejected due to their immaturity to be considered in the SEFA pipeline (i.e., pre-feasibility studies not completed) or their illegibility or mismatch with SEFA's scope and mandate (i.e., below SEFA's threshold of $30 million investment margin). This highlights the need for technical assistance and capacity building for the identification of projects and preparation of project documents. According to the same report, SEFA approved 9 equity investment projects worth $550 million, whereas the amount actually disbursed are $2.5 million. Similarly, it has 5 approved "enabling environment" projects worth $7 million, with only $0.6 million disbursed. Reasons for disbursement are to be investigated as may point to potential financing gaps in mobilizing more funds to disburse to these active projects or implementation challenges and potential CB needs.

AfDB-CIF 2019 and 2016 Annual Reports

Approximately one-third of the CIF funds goes to Africa, making it one of the Bank's key partners improving the access of African countries to international climate change financing. CIF was the biggest external investment source to the Bank in 2018 ($57 million), followed by GEF ($54 million), and GCF ($20 million). The partnership currently finances 39 investment plans in 27 countries and 1 region to promote renewable energy, sustainable transport, climate resilience and sustainable forest solutions through the CIF's four programmes (CTF, SREP, FIP, and PPCR). The annual reports presents the key achievements and exemplary projects and activities.

The supported projects/programmes are mostly Short-term national projects, along with some multinational projects. The regional focus is on **Eastern, Central and Western Africa** and selected parts of Southern, and Northern Africa.

CIF portfolio focuses on energy (CTF and SREP funds), forestry (FIP), agriculture (PPCR).

The sectors receiving highest amounts of CIF-supported funding include:

1. Energy **(mitigation)**: CIF investments in RE projects range from $1.25 million to $125 million per project
2. Agriculture **(adaptation):** CIF investments range from $4 million to $22 million per project
3. Transport infrastructure **(adaptation and mitigation)**
4. Finance **(adaptation and mitigation)**
5. MultiSector **(adaptation and mitigation)**
6. Water **(adaptation)**

In addition, other identified priority areas reported as cross-cutting and interlinked with the abovementioned sectors include Technical/technological assistance, Gender responsive climate action, and Innovation for climate-resilient development.

The quantified needs reported in terms of climate finance is $25 billion that AfDB aims to mobilize during 2020-2025.

The AfDB-CIF 2019 report shows that CIF supported the installation of 710MW of renewable energy so far, compared to the targeted capacity of 3,502 MW, highlighting underachievement or gap of 2,792MW worth of investment. Depending on the cost per unit MW, the total cost needed to achieve the CIF renewable energy target could be estimated, bearing in mind that based on 2019's activity review, for every $1 invested by the CIF, additional $15 could be mobilized.

Also, 24 projects are pending approvals in the CIF pipeline as of 2019. The report does not quantify the costs needed, or the availability of their financing.

The report highlights the need for co-financing: meeting the needs of African countries exceed the capacity of the Bank alone, or any single donor or investment, and will only be fulfilled through collaboration and partnerships between different stakeholders and

organizations on regional and global levels, which will in turn improve access to climate finance. Nonetheless, no specific targets or quantified needs were reported.

The reports sets indicators for assessing progress or performance or projects against specified targets for installed capacity, people supported to cope with CC effects, and people benefiting from improved livelihoods

Africa Climate Change Fund (ACCF) - Supporting African Countries to Access International Climate Finance – 2019

ACCF was established in 2014 to support small–scale or pilot adaptation initiatives. The ACCF portfolio presents projects that highlight the importance of preparatory or "readiness" activities that help countries to strengthen their capacities and enabling environment to access and mobilize climate finance.

The focus is on climate resilient agriculture, women and youth entrepreneurship, and water and sanitation (Adaptation) and clean energy (Mitigation). It provides capacity building to support access to climate finance including GCF project development and GCF accreditation.

The pool of requested funds from the ACCF was $30 million for a total of 8 approved projects since 2017 (4 year-period), most of them identified as small-medium scale projects ranging from $350 thousands to $550 thousands. ACCF plans to approve 5 to 10 innovative new projects that will advance climate finance readiness in Africa.

Tripartite Capacity Building Programme, Phase II - Appraisal Report – 2019

The project is a multinational project implemented in East African Community (EAC), Common Market for Eastern and Southern Africa (COMESA) and Southern African Development Community (SADC) countries in order to support the implementation of the Tripartite Free Trade Area (TFTA) Agreement and Integrate Africa objectives. The Project is fully aligned with the Integrate Africa High-5 and the Bank Group Regional Integration Strategic Framework (RISF, 2018-2025) Pillar 2 'Trade and Investment' which identifies the need to address the challenge of fragmented markets as an important mechanism to improve intra-African trade, realize inclusive growth and poverty reduction. The project scope is capacity building (relevant to adaptation and resilience building).

The project has CC adaptation co-benefits in enhancing the regions' resilience to climatic stressors through enhanced trade facilitation and removal of barriers that would help forge their economic growth to withstand climatic shocks and improve the quality of life for their people. The project's total cost is UA 850 thousand ($1.17 million), 91% of which are foreign funded.

Climate Finance Matters 2019

The report provides basic information on the Bank's internal and external funds. In 2018, 32% of the Bank's project approvals were for climate finance ($3.27 billion). Of that, 51% mitigation and 49% adaptation, almost achieving parity. The Bank committed to allocate 40% of its project approvals as climate finance by 2020, and it has made significant progress on this commitment, increasing from 9% in 2016 to 32% in 2018. The Bank has 4 external CC Funds, and 8 internal Funds. The focus is on renewable energy, energy efficiency, and infrastructure and urban development (Mitigation); and Water infrastructure and sanitation, forestry, sustainable cities and agriculture (Adaptation).