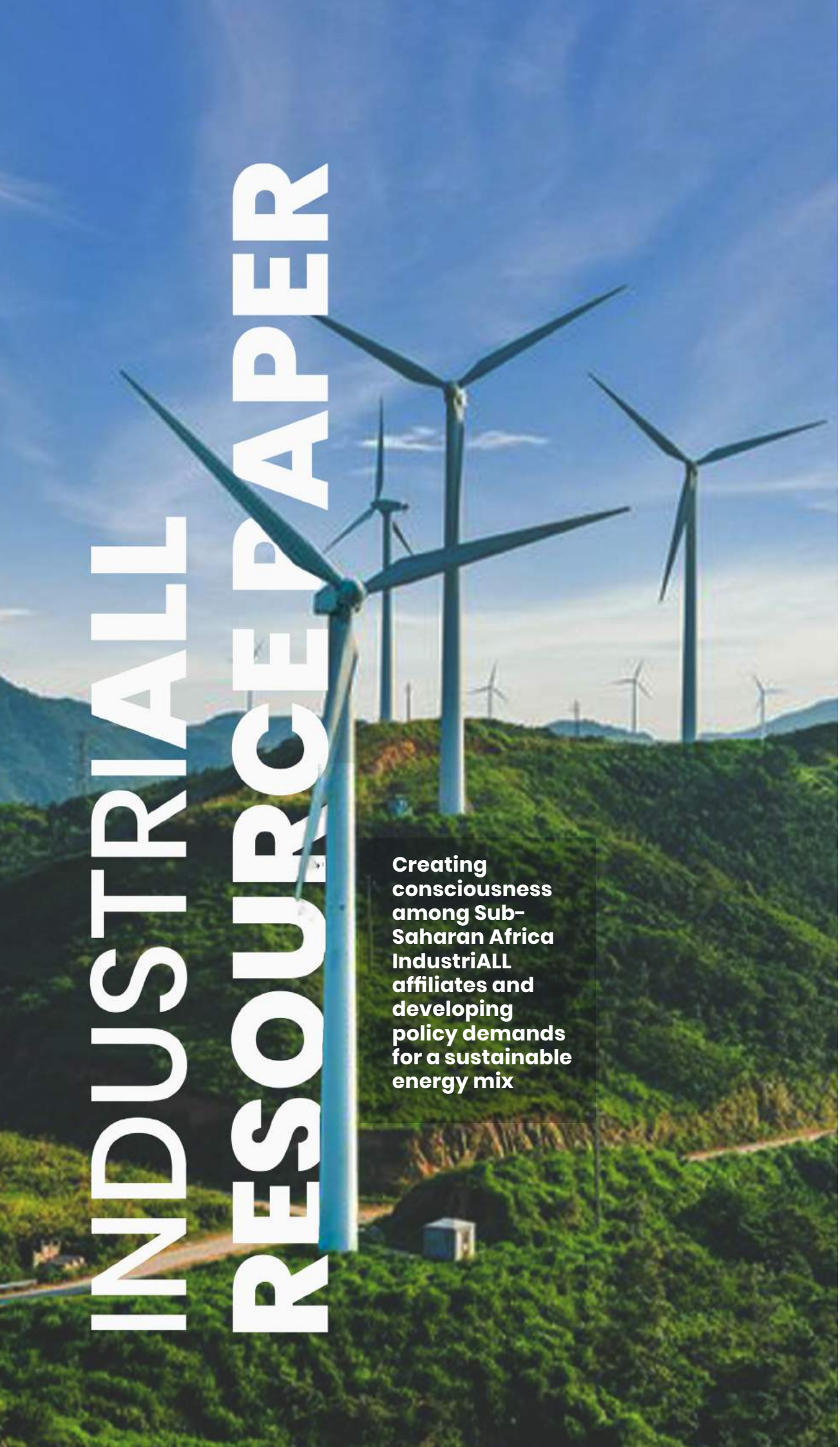

INDUSTRIALL RESOURCE PAPER

Creating consciousness among Sub-Saharan Africa IndustriALL affiliates and developing policy demands for a sustainable energy mix

industri all global union

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Trade Union Competence Centre for Sub-Saharan Africa

Research conducted by the Labour and Economic Development Research Institute of Zimbabwe

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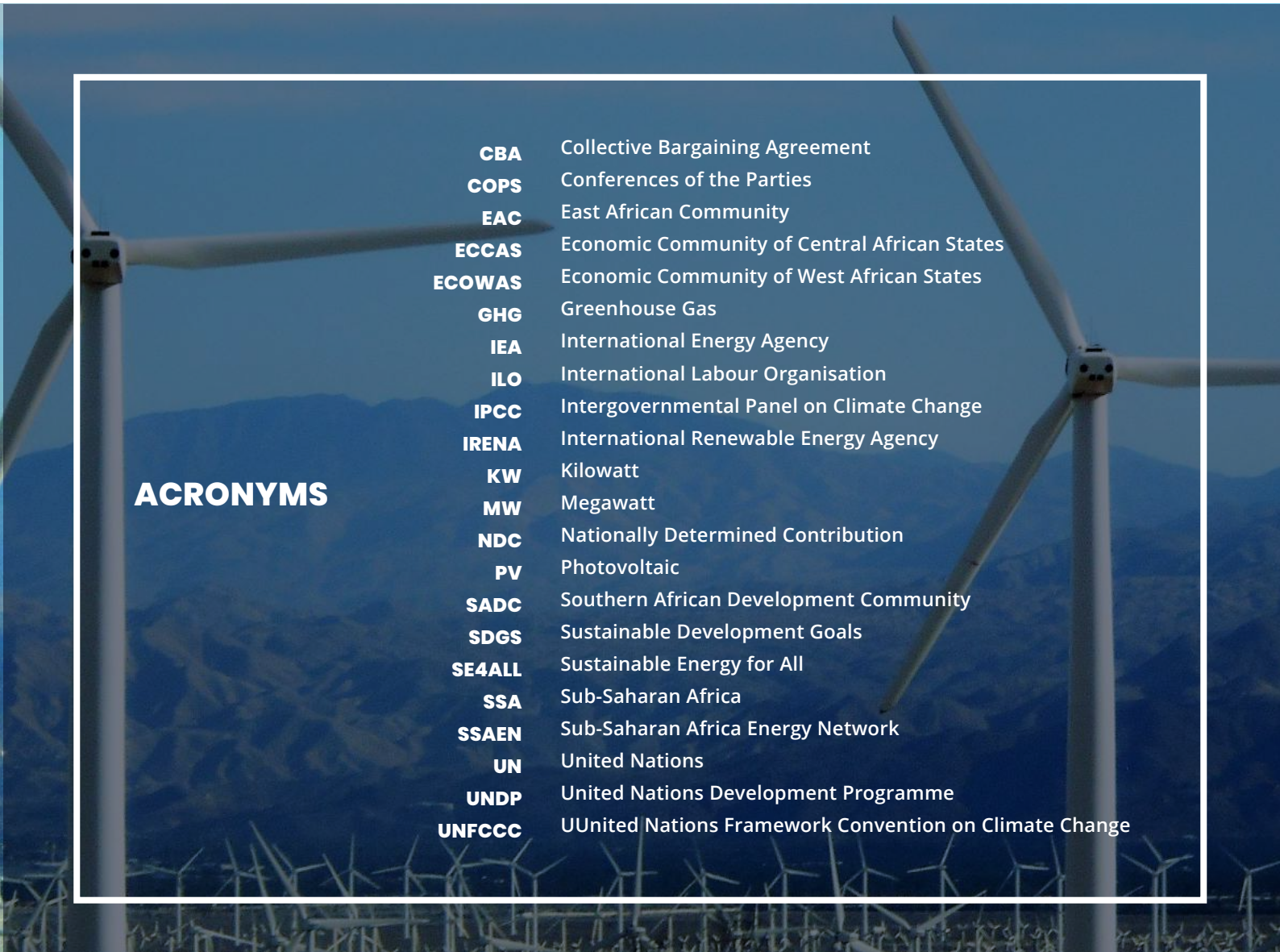


ACRONYMS

CBA	Collective Bargaining Agreement
COPS	Conferences of the Parties
EAC	East African Community
ECCAS	Economic Community of Central African States
ECOWAS	Economic Community of West African States
GHG	Greenhouse Gas
IEA	International Energy Agency
ILO	International Labour Organisation
IPCC	Intergovernmental Panel on Climate Change
IRENA	International Renewable Energy Agency
KW	Kilowatt
MW	Megawatt
NDC	Nationally Determined Contribution
PV	Photovoltaic
SADC	Southern African Development Community
SDGS	Sustainable Development Goals
SE4ALL	Sustainable Energy for All
SSA	Sub-Saharan Africa
SSAEN	Sub-Saharan Africa Energy Network
UN	United Nations
UNDP	United Nations Development Programme
UNFCCC	UUnited Nations Framework Convention on Climate Change

01 INTRODUCTION

1.1 BACKGROUND

Energy resources refer to all forms of fuel used either to heat, generate electrical energy or other forms of energy conversion processes. To meet its energy needs (energy demand), each country or region uses the types of energy resources available to it (energy supply), in differing proportions, including importation where necessary. This is what is called a country or region's energy mix. Energy mix refers to a combination of various energy sources used to meet energy demand in a country or region.

It includes fossil fuels (oil, natural gas and coal), nuclear energy, non-renewable waste and renewable energy (wood, biofuel, hydro, wind, solar, geothermal, heat from heat pumps, renewable waste and biogas). For each region or country, the composition of the energy mix depends on: (i) availability of usable resources domestically or the possibility of importing them, (ii) the extent and type of energy needs to be met, and (iii) the policy choices determined by historical, economic, social, demographic, environmental and geopolitical factors.

The global discourse on energy mix calls for countries to adopt a sustainable mix in the context of climate change. Sustainable energy mix refers to the patterns of energy production and use that support a country or region's present and future energy needs with the least economic, environmental and social costs. This means that for an energy mix to be sustainable the mix should include sources of energy that are naturally replenished on a human time scale, which include wind, hydro, tidal, solar, biomass, geothermal.

THE SUSTAINABLE ENERGY MIX.

The achievement of a sustainable energy mix is now a global issue framed within the context of climate change and green economy, and more particularly on the renewable energy agenda. Whereas the global energy landscape is moving towards renewable energy, countries in the Sub-Sahara African (SSA) region are faced with a dilemma of energy choices given that it has abundant and new discoveries of fossil sources, whilst on the other hand there is a global call for an energy transition from fossils to renewable energy.

The global renewable energy agenda is motivated by the need to reduce emissions which are responsible for climate change in keeping with the Paris Agreement of 2015 and Sustainable Development Goal (SDG) 7: Ensure access to affordable, reliable, sustainable and modern energy for all. All these energy dynamics are occurring at a crucial time; when global energy demand is on the increase. For instance, energy demand increased by 2.3 percent from 253 Mtoe in 2017 to 328 Mtoe in 2018, driven by a robust global economic growth of 3.7 percent in 2018 (EIA[1] , 2019).

Africa's energy demand increased by 2.9 percent from 449 Mtoe in 2017 to 462 Mtoe in 2018 (BP Statistical Review, 2019). This, therefore, calls for SSA countries to rethink policy options that address the energy challenge (crisis) without increasing greenhouse gas emissions at the same time. Hence, the need to diversifying the national and regional energy portfolios or energy mix of SSA countries becomes more apparent.

However, over recent years, SSA countries' pace of adopting renewable energy has remained low due to the abundant availability of fossil fuels, discovery of new deposits and the high cost of investment on renewable energy versus fossil fuels. Compared to the majority of fossil fuel-dependent industrial countries, the energy transition in SSA presents a distinct feature. With the exception of a few countries such as South Africa, most SSA countries are not in a situation of pressure where they need to phase out of coal to meet their energy needs through alternative energy sources.

According to Gueye (2018)2 , since 2004, there has been a wave of oil and gas discoveries in countries such as Chad, Ghana, Guinea, Guinea-Bissau, Kenya, Liberia, Mali, Mauritania, Mozambique, Sao Tome Principe, Senegal, Sierra Leone, Tanzania, Togo, and Uganda. According to the Africa Energy Outlook of 2014, 30 percent of global oil and gas discoveries made between 2010 and 2014 have been in Sub-Saharan Africa.

[1] *IEA - International Energy Agency*
[2] *www.ictsd.org/bridges-news/bridges-africa/news/africas-energy-transition-opportunities-and-challenges-for-decent*

INDUSTRIALL GLOBAL UNION

Thus, moving towards a sustainable energy mix for SSA seems rather complex, with ramifications for the structure of economies and future development prospects. Therefore, this requires robust discussions and effort by policymakers and all stakeholders, including trade unions.

Such efforts need to be supported by a paradigm and structural shift by policymakers at both country and regional level to prioritise reliable and sustainable energy for SSA's development agenda as a foundation to steer the energy system of SSA countries towards sustainability and energy security.

It is within this context that the IndustriALL Global Union, working with its affiliates, supports the development of a sustainable energy mix through democratic discussions at both country and regional levels.

Trade unions being essential national stakeholders have a vital role to play in the development and implementation of a sustainable energy mix. This is against the background that a sustainable energy mix has the opportunity to foster sustainable economic growth, ensuring efficient and sufficient energy supply for Africa's industrialisation, and creating new employment opportunities.

Trade unions in the energy sector have to actively participate in national processes towards a sustainable energy mix to ensure a just transition from fossil energy to renewable energy.

Effective participation of trade unions in initiatives such as Africa Renewable Energy Initiative (AREI), the UN Framework Convention on Climate Change (UNFCCC), Sustainable Energy for All (SE4ALL), SDGs, Agenda 2063, Power Africa is also critical to influence public policy decisions for the betterment of workers in the energy sector.

It is within this context that the research was undertaken to ensure that trade unions, in particular IndustriALL affiliates: (i) fully comprehend their roles and develop their readiness capacity at each level, (ii) formulate effective and practical response mechanisms, and (iii) develop internal policies on the sustainable energy mix discourse.

They also have the responsibility to advocate and influence policies and legislative reforms that achieve sustainable energy mix in a manner that promotes and protects workers' rights and interests at enterprise, sectoral, national and regional and international level.

1.2 OBJECTIVES OF THE RESEARCH

The primary objectives of the research include:

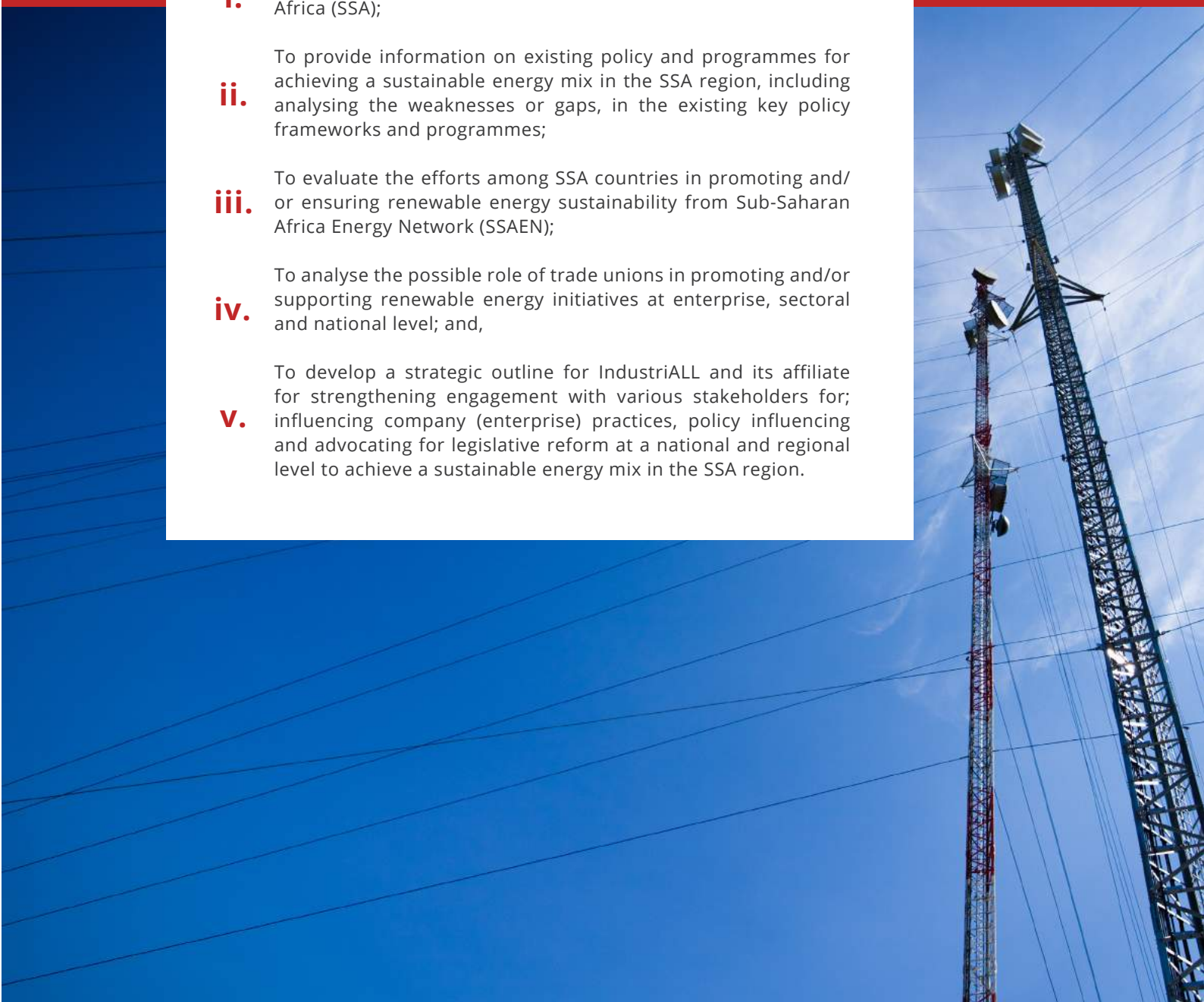
i. To provide information on the state of energy mix in Sub-Saharan Africa (SSA);

ii. To provide information on existing policy and programmes for achieving a sustainable energy mix in the SSA region, including analysing the weaknesses or gaps, in the existing key policy frameworks and programmes;

iii. To evaluate the efforts among SSA countries in promoting and/or ensuring renewable energy sustainability from Sub-Saharan Africa Energy Network (SSAEN);

iv. To analyse the possible role of trade unions in promoting and/or supporting renewable energy initiatives at enterprise, sectoral and national level; and,

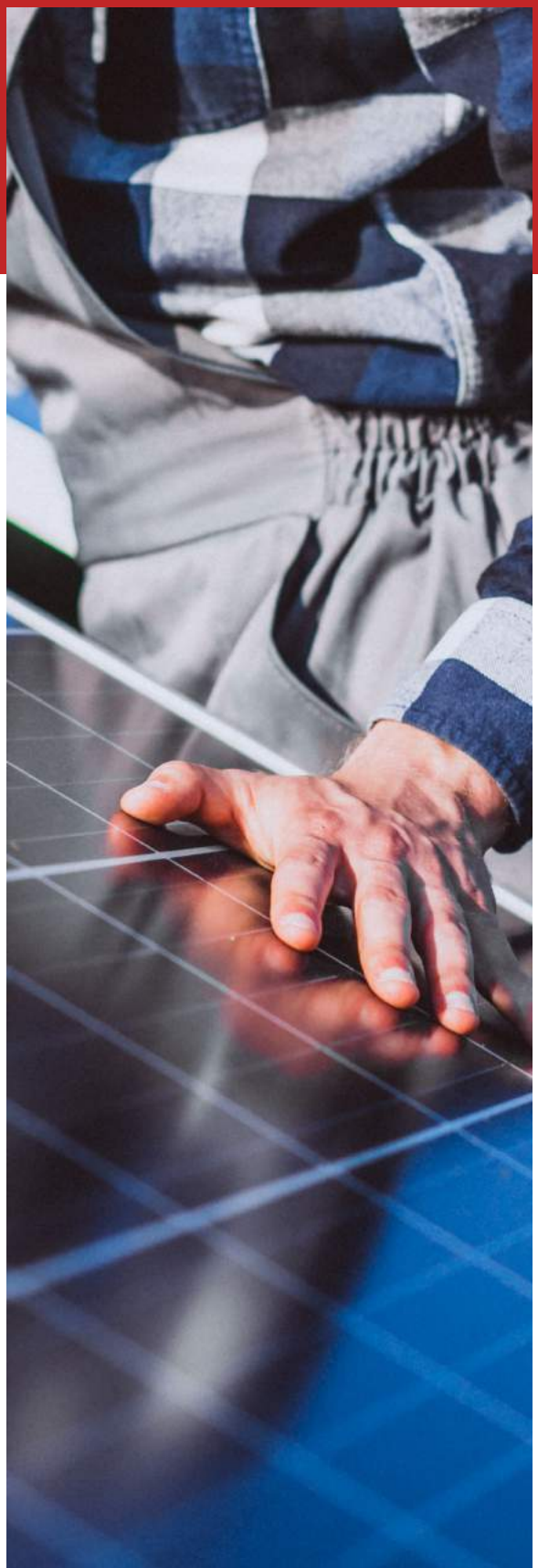
v. To develop a strategic outline for IndustriALL and its affiliate for strengthening engagement with various stakeholders for; influencing company (enterprise) practices, policy influencing and advocating for legislative reform at a national and regional level to achieve a sustainable energy mix in the SSA region.



1.3 RESEARCH METHODOLOGY AND APPROACH

The research used the triangulation research methodology. It is a multi-method strategy, aimed at enhancing confidence in the ensuing findings, establishing the reliability and validity of the approaches and information collected.

Both quantitative and qualitative approaches were applied using; questionnaires and undertaking telephone interviews with key informants drawn from IndustriALL affiliates so as to capture the workers' voices.



DESK REVIEW

A review of literature was undertaken, focusing on SSA's energy and renewable energy policies, Nationally Determined Contribution (NDC) reports in SSA countries, especially those countries with IndustriALL affiliates noted in Annex 1; IndustriALL continental programme; sub-regional (SADC, ECOWAS, EAC, ECCAS) renewable energy initiatives; Agenda 2030 (SDGs) and Agenda 2063 frameworks, IndustriALL affiliates' strategic documents and policies including Collective Bargaining Agreements (CBAs) and annual reports. Focus was also placed on gender dynamics.

QUESTIONNAIRE

A questionnaire was administered to IndustriALL affiliates in SSA (Annex 1). Out of the 19 questionnaires administered, only nine were responded to representing a 47 percent response rate.

KEY INFORMANT INTERVIEWS (KIIS)

Two telephonic interviews were done with the Electricity Supply Corporation of Malawi Staff Union (ESU) and Swaziland Electricity Supply Maintenance and Allied Workers Union (SESM-AWU).

1.4 LIMITATIONS OF THE RESEARCH

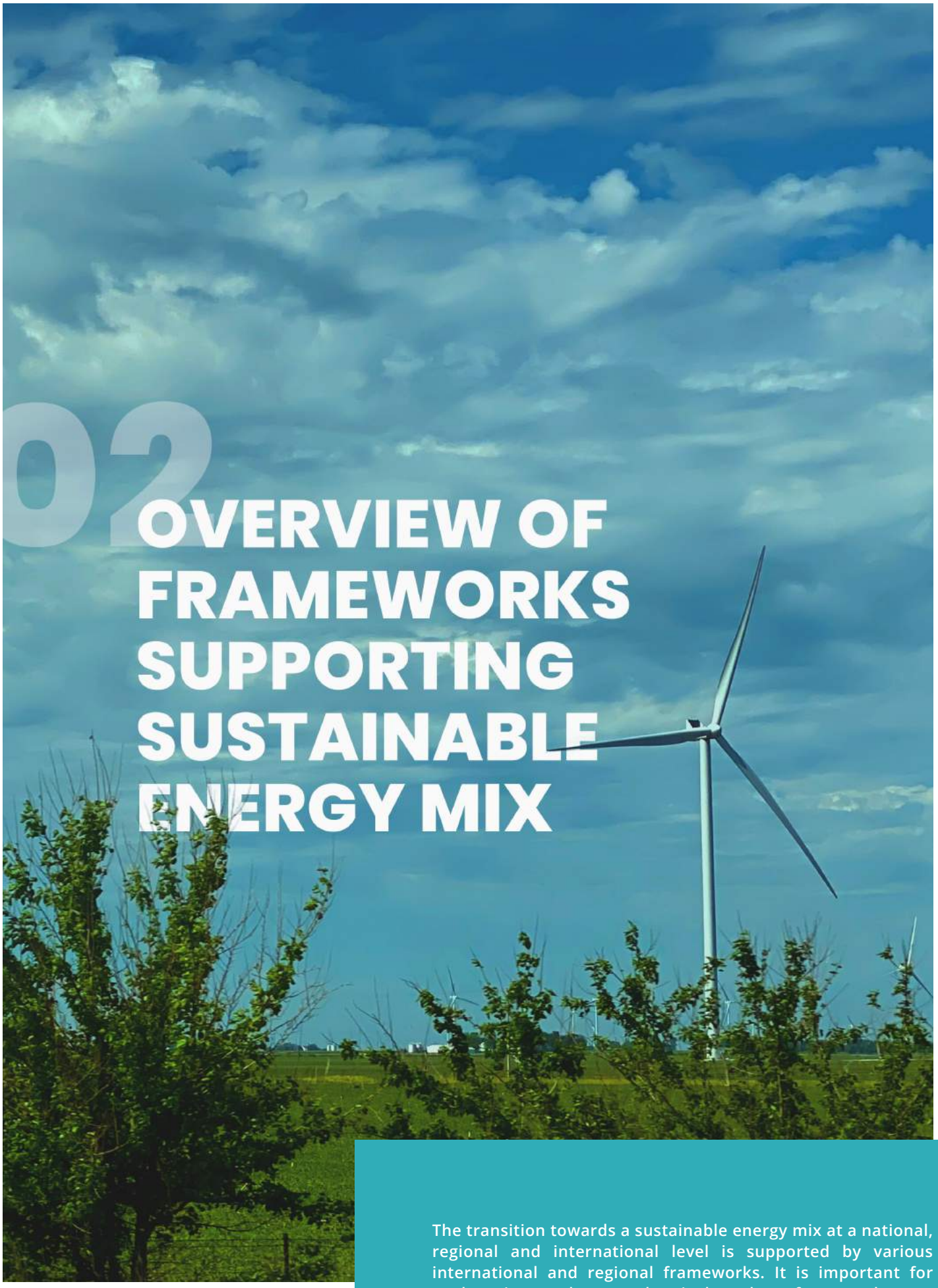
The following limitations were encountered during this research:

i. Low questionnaire response rate from IndustriALL affiliates,

ii. While equal attention was given to all sub-regions of SSA, there was limited data and information on the policy, legislative and institutional frameworks on energy and energy mix for selected sub-regions such as Economic Community of Central African States (ECCAS).

iii. Limited data on the state of the energy mix in some countries,

iv. Lack of data on total energy generation and capacity for some countries and sub-regions. As such, the paper focused more on electricity mix, and yet the initial intended focus was on total energy mix.



02 OVERVIEW OF FRAMEWORKS SUPPORTING SUSTAINABLE ENERGY MIX

The transition towards a sustainable energy mix at a national, regional and international level is supported by various international and regional frameworks. It is important for trade unions to know and articulate these frameworks as a basis for their advocacy demands, and engagement efforts with the governments and other key stakeholders at national regional and international level.

2.1 INTERNATIONAL FRAMEWORKS

THE PARIS AGREEMENT OF 2015

It is an agreement within the United Nations Framework Convention on Climate Change (UNFCCC), dealing with greenhouse-gas-emissions mitigation (reducing carbon emission), adaptation, and finance. Under the Paris Agreement, each country must determine, plan, and regularly report on the contribution that it undertakes to reduce carbon emission.

The contributions that each country should make to achieve the global goal are determined by what are called nationally determined contributions (NDCs). Thus, NDCs provide a country's renewable energy pledge, particularly concerning national energy plans and actual renewable energy deployment trends.

The REN Alliance underlined that a renewable energy supply is not only good for the climate but offers manifold economic and social benefits, for developing and for industrialized countries alike. Hence the global transition to a renewable energy future (sustainable energy mix) is not a financial burden, but will enhance economic growth and address the energy poverty in the majority of the SSA countries.

SUSTAINABLE DEVELOPMENT GOALS (SDGS) (2015-2030)

SDG 7 aims to "ensure access to affordable, reliable, sustainable and modern energy for all." It'stargets are to ensure universal access to affordable, reliable and modern energy services, substantially increase the share of renewable energy in the global energy mix, and double the global rate of improvement in energy efficiency, all by 2030.

For instance, Target 7.2 states that: "By 2030, increase substantially the share of renewable energy in the global energy mix". Thus, SDG 7 underscores the need for countries to transition towards a sustainable energy mix for all countries.

This is against the background that promotion of a sustainable energy mix is fundamental for development through poverty reduction, reduction in energy poverty, and, supporting provision of basic needs such as food, lighting, water, sanitation, essential health care, education, communication and transport.

A sustainable energy mix is also a necessary input into income generation and productive activities such as agriculture and industry and contributes towards the reduction of inequalities.

The International Renewable Energy Alliance (REN Alliance) is a coalition of five renewable energy associations who entered a formal partnership in June 2004.

The five non-profit international renewable energy organisations are: International Hydropower Association (IHA); International Solar Energy Society (ISES); International Geothermal Association (IGA); World Wind Energy Association (WWEA); and, World Bioenergy Association (WBA).

The alliance provides a unified cross-sectoral voice on renewable energy in international and regional energy fora and media.

2.2 REGIONAL FRAMEWORKS

AFRICA AGENDA 2063

Agenda 2063 is a strategic framework for the socio-economic transformation of the African continent within a 50-year period, from 2013 to 2063. Renewable energy is one of the priority areas of Agenda 2063. The targets for 2023 include:

01 Raise the share of renewable energy (wind, solar, hydro, bio and geothermal) in total energy production by at least 10 percent,

02 At least 10 percent of all urban buildings are certified as energy smart, and,

03 At least 15 percent of all urban mass transport operates on low renewable and low emissions fuel.

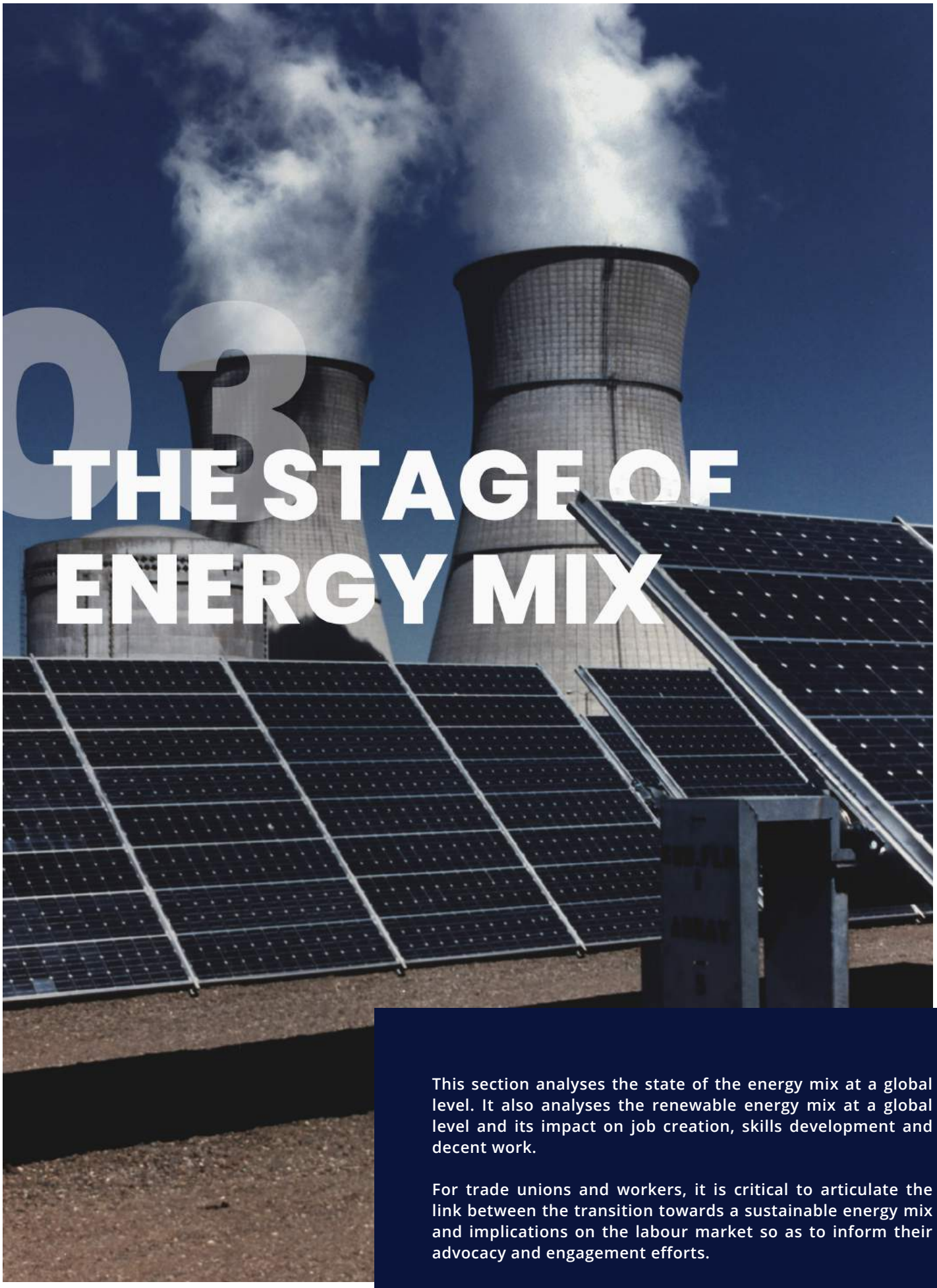
THE AFRICA RENEWABLE ENERGY INITIATIVE (AREI)

It was launched at COP21 in 2015 as a transformative, Africa-owned and Africa-led inclusive effort to accelerate and scale up the harnessing of the continent's huge renewable energy potential.

Under the mandate of the African Union and endorsed by African Heads of State and Government on Climate Change (CAHOSCC) the Initiative is set to achieve at least 10GW of new and additional renewable energy generation capacity by 2020, and mobilise the African potential to generate at least 300 GW by 2030.

ROADMAP FOR A RENEWABLE ENERGY FUTURE AFRICA (2015)

This is an initiative that the African Union and IRENA developed to ensure deployment of modern renewables to eliminate power shortages, bringing electricity and developing opportunities to rural villages that have never enjoyed those benefits, spur on industrial growth, create entrepreneurs, and support increased prosperity across the continent.



03 THE STAGE OF ENERGY MIX

This section analyses the state of the energy mix at a global level. It also analyses the renewable energy mix at a global level and its impact on job creation, skills development and decent work.

For trade unions and workers, it is critical to articulate the link between the transition towards a sustainable energy mix and implications on the labour market so as to inform their advocacy and engagement efforts.

This is against the background that trade unions should move beyond the traditional workplace demands and focus on broader global and community issues that also affect workers.

3.1 ENERGY MIX AT THE GLOBAL LEVEL

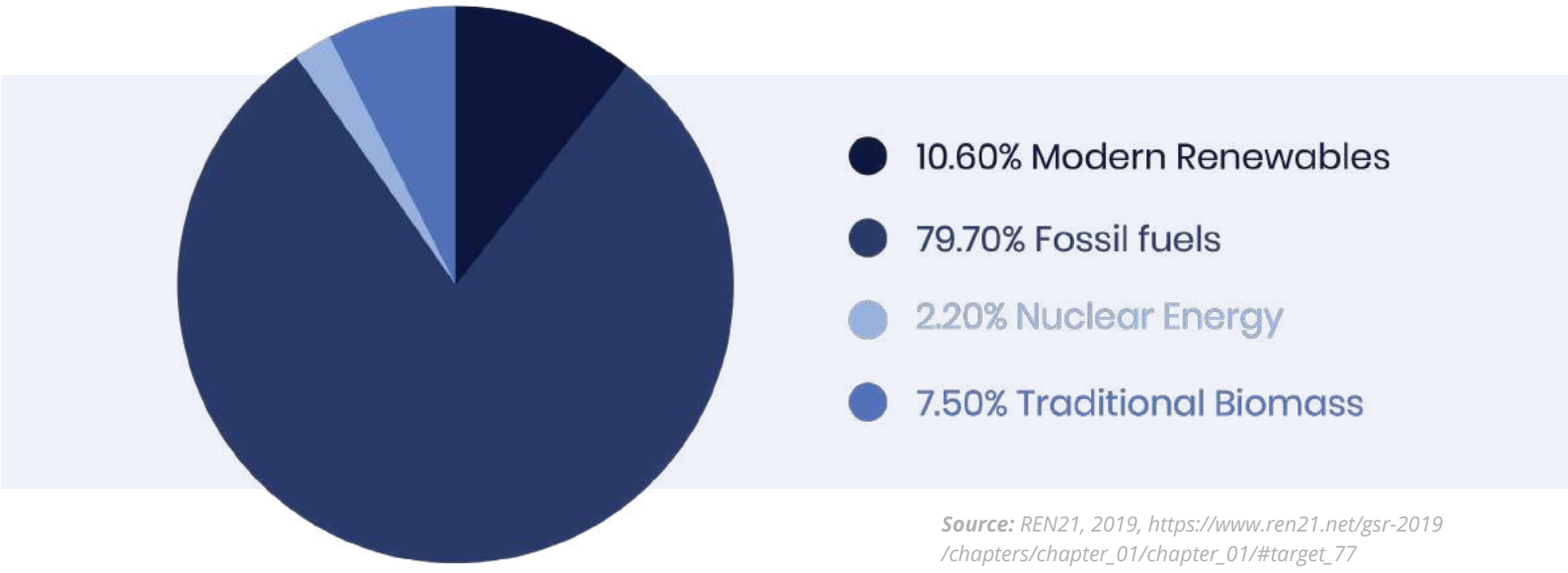
Figure 3.1 shows the global energy mix in the total final energy consumption in 2017. Figure 3.1 indicates that fossil fuels constituted the highest share in total final energy consumption of 79.7 percent.

Contrary to the global call for a transition from fossil fuels to a sustainable energy mix, the share of fossil fuels remain high due to subsidies for fossil fuel. At a global level, fossil fuel subsidies increased by 11 percent, from US$270 billion in 2016 to an estimated US$300 billion in 2017.

This was about double the estimated support for renewable power generation in the same year. Fossil fuel subsidies remained in place, in at least 115 countries in 2017, whilst 73 countries provided subsidies of more than US$100 million each (REN21, 2019).

Thus, fossil fuel use remains high mainly driven by domestic policies to (i) encourage domestic energy production especially in countries heavily endowed with the fossil deposits, (ii) lower the cost of fossil fuel production, and, (iii) keep prices for consumers at affordable prices and reduce costs for consumers and producers.

Figure 3. 1: *The global share of energy sources in the total final energy consumption, 2017*



Source: *REN21, 2019, https://www.ren21.net/gsr-2019 /chapters/chapter_01/chapter_01/#target_77*

At an African level, energy consumption accelerated slightly in 2018, growing by 2.9 percent, compared with the 10-year average growth of 2.7 percent. According to Table 3.1, Africa's energy consumption and electricity generation mix remained unsustainable as it was largely dominated by fossils.

Africa's consumption growth was strong across all the main fuels in the energy mix between 2017 and 2018. Gas and coal together contributed 91 percent of incremental energy demand. Oil remained the leading fuel, accounting for 41 percent of African energy consumption in 2018, down from 43 percent in 2008.

Natural gas accounted for 28 percent up from 22 percent in 2008. Coal demand growth of 3.9 percent was much stronger in 2018 compared with the average growth of the past 10 years of 0.6 percent.

However, coal's share in energy dropped from 28 percent in 2008 to 22 percent in 2018. Whilst other renewables gained market share over the last ten years, accounting for 1.6 percent of energy consumption in 2018, up from just 0.3 percent in 2008, its share in the energy mix remained small.

Table 3.1: *Energy Consumption and Electricity Generation in Africa*

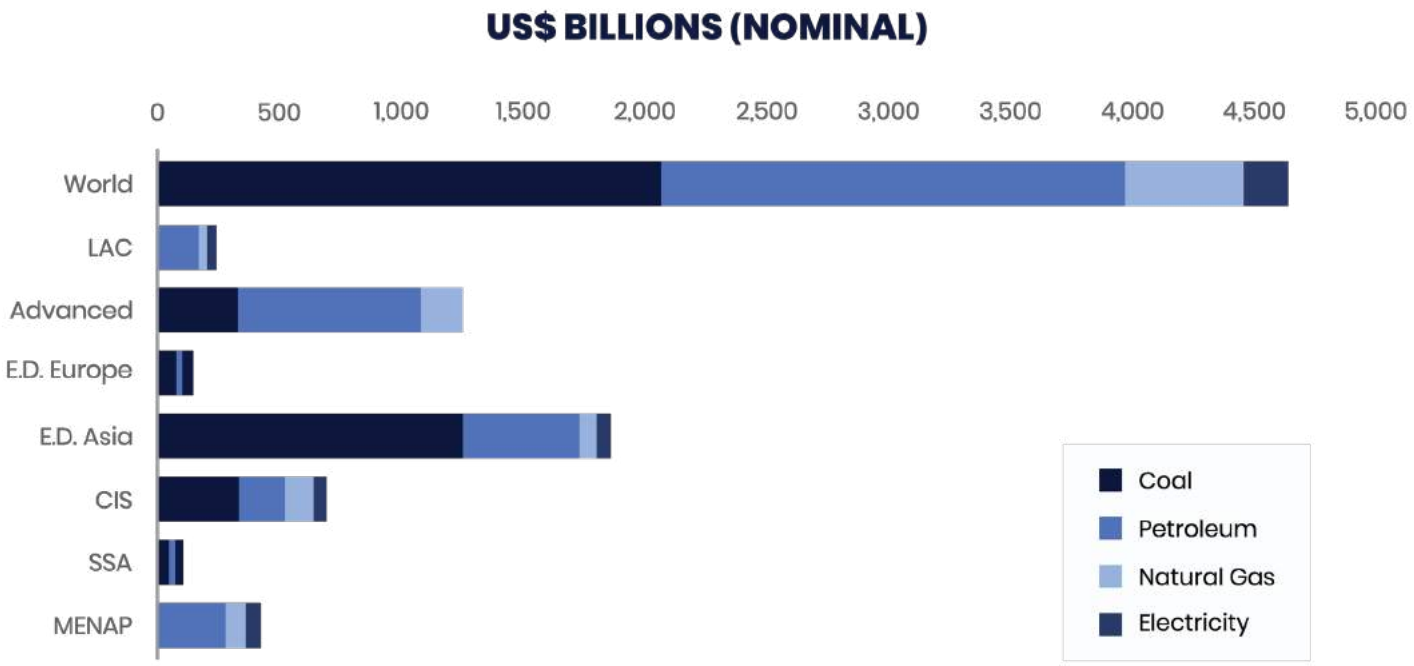
		OIL	NATURAL GAS	COAL	NUCLEAR	HYDRO	OTHER RENEWABLES
CONSUMPTION (%)	**2008**	43.0	22.0	28.0	0.8	6.0	0.3
	2017	43.0	27.0	22.0	0.8	6.3	1.4
	2018	41.0	28.0	22.0	0.5	6.5	1.6
ELECTRICITY GENERATION (%)	**2008**	10.0	30.0	41.0	2.0	16.0	0.7
	2017	10.0	39.0	30.0	2.0	15.0	3.2
	2018	9.1	40.0	30.0	1.0	1.6	3.7

Source: *BP Statistical Review 2019*

GLOBAL ENERGY SUBSIDIES

In absolute terms, in 2015, China was the largest subsidizer (at US$1.4 trillion), followed by the United States (US$649 billion), Russia (US$551 billion), European Union (US$289 billion), and India (US$209 billion) (IMF, 2019). Figure 3.2 shows the subsidies by geographical regions.

Figure 3.2: *Global Energy Subsidies by Region and Energy Product, 2015*



Source: *IMF, 2019*

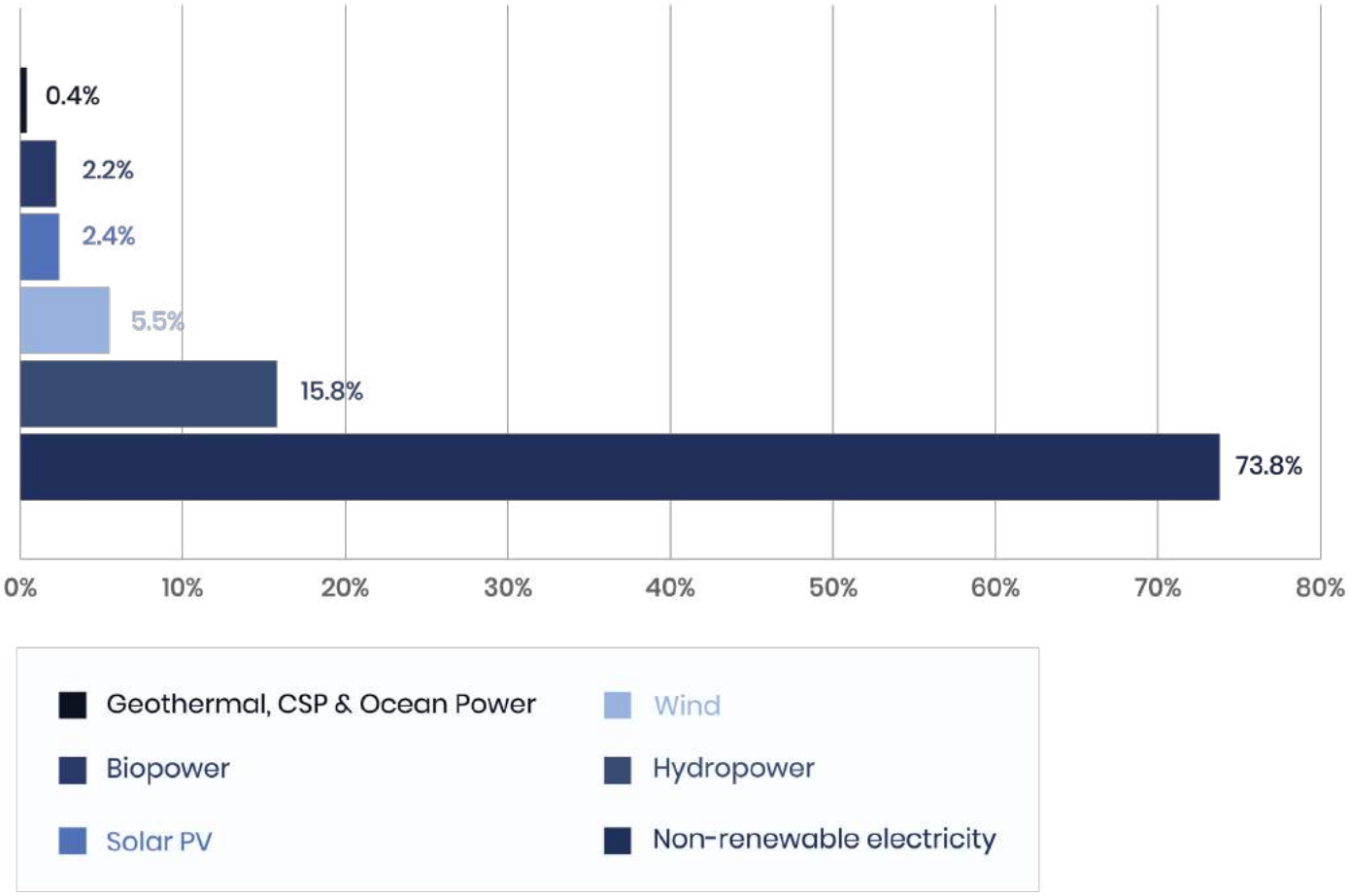
Notes: *LAC- Latin America and the Caribbean; E.D. Europe- Emerging and Developing Europe; E.D. Asia - Emerging and Developing Asia; CIS - Commonwealth of Independent States; MENAP - Middle East, North Africa, Afghanistan, and Pakistan.*

In 2015, the Emerging and Developing Asia had the largest subsidy contribution for all energy sources with coal being the major beneficiary sector. The second-largest region to provide energy subsidy was the Advanced countries with petroleum being the major beneficiary sector. The SSA region was the least of all the seven regions in the provision of energy subsidies, with the coal sector being the major beneficiary.

According to 2019 REN21 report, the continued large share of fossil fuel consumption was driven by (i) the low fossil fuel prices that encourage further demand for fossil fuels and challenge renewable energy markets, especially in the heating and transport sectors, (ii) the increased spending by the coal industry and major oil and gas companies of US$200 million each year lobbying to delay, control or block policies aimed at addressing climate change and on advertisements to influence public opinion.

Similarly, further analysis of the source of energy for electricity shows that fossil fuels contribute the largest share of energy source for global electricity production (Figure 3.3).

Figure 3.3: *Estimated renewable share of global electricity production (%), 2018*



Source: *REN21, 2019*

Figure 3.3 shows that at the end of 2018, the largest source of electricity came from non-renewable energy (fossils), constituting 73.8 percent, followed by hydropower ay 15.8 percent and wind at 5.5 percent. Electricity generation still largely remains non-renewable driven by energy subsidies in fossil fuels. This clearly indicates that at the global level, more efforts are required for a structural shift towards a more sustainable energy mix in electricity production.

An analysis of Africa's electricity generation mix follows a similar trend to that of the global level. Table 3.2 illustrates that fossil fuels dominate the electricity mix of Africa with natural gas and coal having the largest share of 40 percent and 30 percent, respectively in 2018. The share of renewable energy sources for electricity generation remains smaller compared to fossil sources. Of the renewable energy sources, hydropower contributed the largest source of electricity generation in all the years.

Table 3.2: *Electricity Generation in Africa, 2008, 2017, 2018*

		OIL	NATURAL GAS	COAL	NUCLEAR	HYDRO	OTHER RENEWABLES
ELECTRICITY GENERATION (%)	**2008**	10.0	30.0	41.0	2.0	16.0	0.7
	2017	10.0	39.0	30.0	2.0	15.0	3.2
	2018	9.1	40.0	30.0	1.0	16.0	3.7

Source: *BP Statistical Review 2019*

However, despite the abundance of the relatively cheaper source of fuel (coal), access to electricity remains a challenge for most SSA countries (Table 3.3). Whereas the Sub-Saharan Region has witnessed an increase in the population with access to electricity on average by 11 percent, between 2010 and 2017, with only two countries (Gabon and Mauritius) recording a reduction, the region still has a long way to go in ensuring access to electricity.

The number of countries with more than 50 percent of its population having access to electricity increased from 13 to 20 between 2010 and 2017. This means less than half of the population in SSA has access to electricity. Given these statistics, investments and deliberate growth in renewable energy technologies, both off-grid and on-grid will ensure improved access to electricity in the region, especially in the rural areas.

Table 3.3: *Access to electricity (% of population) - Sub-Saharan Africa,*

	Country	2010	2017	% change
1	Angola	33.4	41.9	8.5
2	Benin	34.2	43.1	8.9
3	Burkina Faso	13.1	25.5	12.4
4	Botswana	52.7	62.8	10.2
5	Central African Republic	9.8	30.0	20.2
6	Cote d'Ivoire	58.0	65.6	7.7
7	Cameroon	53.1	61.4	8.3
8	Congo, Dem. Rep.	12.9	19.1	6.2
9	Congo, Rep.	42.3	66.2	23.9
10	Comoros	70.2	79.9	9.8
11	Cabo Verde	81.1	92.9	11.8
12	Gabon	92.4	92.2	(0.2)
13	Ghana	64.2	79.0	14.8
14	Guinea	25.7	35.4	9.8
15	Gambia, The	48.4	56.2	7.8
16	Guinea-Bissau	6.0	26.0	20.0
17	Equatorial Guinea		67.2	67.2
18	Kenya	19.2	63.8	44.6
19	Liberia	5.1	21.5	16.4
20	Lesotho	20.8	33.7	12.9
21	Madagascar	16.9	24.1	7.2

	Country	2010	2017	% change
22	Mali	25.3	43.1	17.8
23	Mozambique	18.3	27.4	9.1
24	Mauritius	100.0	98.0	(2.0)
25	Malawi	8.7	12.7	4.0
26	Malaysia	99.2	100.0	0.8
27	Namibia	44.2	52.5	8.3
28	Niger	12.7	20.0	7.4
29	Nigeria	48.0	54.4	6.4
30	Rwanda	9.7	34.1	24.4
31	Senegal	55.2	61.7	6.5
32	Sierra Leone	11.5	23.4	11.9
33	Sao Tome and Principe	59.7	72.5	12.8
34	Eswatini	45.6	73.5	28.0
35	Seychelles	97.0	100.0	3.0
36	Chad	6.4	10.9	4.5
37	Togo	30.8	48.0	17.2
38	Tanzania	14.8	32.8	18.0
39	Uganda	12.1	22.0	9.9
40	South Africa	82.9	84.4	1.5
41	Zambia	22.0	40.3	18.3
42	Zimbabwe	40.1	40.4	0.3
Sub-Saharan Africa		**33.5**	**44.6**	**11.0**

Source: World Bank, 2019

3.1 RENEWABLE ENERGY MIX

The 2019 Renewables Global Status Report indicated that renewable energy usage grew between 2017 and 2018, as shown in Table 3.4. The report stated that over ninety countries have more than 1 gigawatts share of renewable energy whilst over 30 countries have more than 10 gigawatts of the of renewable energy in their energy mix.

Table 3.4: *Global Renewable Energy Indicators in Gigawatts (GW), 2017-2018*

Type of Renewable Energy	2013	2014	2015	2016	2017	2018	% change (2010-2018)
Renewable power capacity (including hydropower)	1,578	1,712	1,856	2,017	2,197	2,378	51
Renewable power capacity (excluding hydropower)	560	657	785	921	1,081	1,246	123
Hydropower capacity	1,018	1,055	1,071	1,096	1,112	1,132	11
Wind power capacity	319	370	433	487	540	591	85
Solar PV capacity	138	177	228	303	405	505	266
Bio power capacity	88	93	106	112	121	130	48
Geothermal power capacity	12	13	13	14	13	13	10
Concentrating solar thermal power (CSP) capacity	3	4	5	5	5	6	62
Ocean power capacity	N/A	N/A	N/A	N/A	1	1	**
Bioelectrical generation (annual) - TWh	396	433	464	504	532	581	47

Source: *REN21 Annual reports (2010 - 2019)*

Table 3.4 indicates that there has been a rise in renewable energy capacity across the board save for ocean power capacity. Overall, global renewable energy capacity (excluding hydropower) grew by 123 percent between 2013 to 2018. For individual renewable energy sources, solar PV capacity recorded the highest growth of 266 percent between 2010 and 2018.

It was followed by wind power capacity at 85 percent and concentrating solar thermal power (CSP) capacity at 62 percent, amid increased public investments and international support in renewable energy in developing countries (IRENA, 2019).

3.2.1 THE IMPACT OF TRANSITIONING TO A SUSTAINABLE ENERGY MIX ON JOB CREATION

The transition towards a more sustainable energy mix has both positive and negative impacts on the labour market in terms of job creation and quality of jobs created. Sections below analyses the labour market impact.

The move towards a sustainable energy mix has a direct and indirect impact on job creation. According to the International Labour Organisation (ILO), jobs that are created in renewable energy sectors are called green jobs. Whilst it is clear that investment in renewable energy has a positive impact on job creation, the ILO was quick to note that there is also the potential for job losses in the fossil fuel industry as companies transition towards renewable technologies. This may, in turn, impact negatively on trade unions and their operations.

As more jobs are lost, trade unions lose membership which may undermine their strength. Hence, the reason why trade unions need to actively participate in policy processes around transitioning towards a sustainable energy mix to ensure a just transition takes place and workers who lose jobs are adequately compensated or reskilled so that they remain active in the labour market.

As illustrated in Table 3.5, solar PV generated more jobs compared to all the renewable technologies as reflected by the increasing growth capacity of solar as well as higher demand in emerging markets and in Europe, due largely to ongoing price reductions. Between 2015 and 2018, the number of jobs in the concentrating solar thermal power (CSP) increased by 142.9 percent whilst jobs in solar PV sector grew by 30.1 percent, followed by liquid biofuels at 22.9 percent. Hence, there is a job case in the transition towards a sustainable energy mix.

Table 3.5: *Jobs in renewable energy, 2015,2018*

Type of Renewable Energy	2015 (mil)	2018 (mil)	% change
Solar PV	2,772	3,605	30.1
Liquid biofuel	1,678	2,063	22.9
Wind energy	1,081	1,160	7.3
Solar heating and cooling	939	801	-14.7
Solid Biomass	822	787	-4.3
Biogas	382	334	-12.6
Hydro	204	2054	
Geothermal energy	160	94	-41.3
Concentrating solar thermal power (CSP)	14	34	142.9

Source: *REN21 Annual reports*

However, in the SSA region, the discourse of green jobs is still in its infancy at a time when other regions have started reporting on the jobs created through renewable energy investments. Only South Africa has managed to enumerate jobs created through renewable energy project deployment. This means SSA countries have lagged and need to catch up with international developments on renewable energy and enumerate green jobs and provide up-to-date data disaggregated by gender so as inform policy direction.

In 2016, IRENA estimated that the renewable energy sector employed 8.3 million people (directly and indirectly) worldwide with 62,000 jobs in Africa. Nearly half of those jobs were in South Africa and a quarter in North Africa.

Source: IRENA, 2017, Renewable energ and jobs Annual review

Additionally, the transition towards a sustainable energy mix requires policies that are put in place to manage social and employment impacts carefully in order to avoid social and economic disruptions (just transition). For trade unions, the fear or threat of job losses deterrent towards a transition to a sustainable energy mix may act as a deterrent to maintain the status quo or slow progress.

Thus, effective social dialogue, planning for a just transition, and social protection policies are all elements of a just transition framework that can assist SSA governments and trade unions to manage the energy transition well.

3.2.2 THE IMPACT OF TRANSITIONING TO A SUSTAINABLE ENERGY MIX ON SKILLS DEVELOPMENT

The transition towards a sustainable energy mix and renewable energy requires investment in green skills. The renewable energy sector requires a wide variety of skills and occupations, ranging from construction workers to plumbers and electricians, and technicians and engineers with various specialisations.

A global review of skills for green jobs including four countries in Africa (Egypt, Mali, South Africa, and Uganda) revealed the existence of a gap between the goals and targets set in environmental policies and the human resources available for their implementation (Gueye, 2018).

Cape Verde launched a Renewable Energy and Industrial Maintenance Centre (Cermi), whose main activity is the training of professionals in the areas of design, assembly, and maintenance of photovoltaic installations.

Already, there exist skills gaps for technical and engineering positions in various sectors of SSA countries, and this becomes worse when the renewable energy sector is factored in, especially in the SSA context where entrepreneurship and self-employment are becoming the norm among the youth.

For instance, in Kenya, 80 percent of the technicians needed to build and operate a new wind farm, the largest in Africa were recruited on the international market (Kees van der Ree, 2019).

Hence, robust efforts are needed in education and training systems such as investing in STEM (Science, Technology, Engineering and Maths) subjects, developing renewable energy curricula for all levels, integrating green skills modules into vocational training courses, supporting green apprenticeships, and establish common quality standards of green products.

All these processes require the input of trade unions in order to ensure that the trade union concerns and interests are integrated into the education and training reforms.

3.2.3 THE IMPACT OF TRANSITIONING TO A SUSTAINABLE ENERGY MIX ON DECENT WORK CONDITIONS

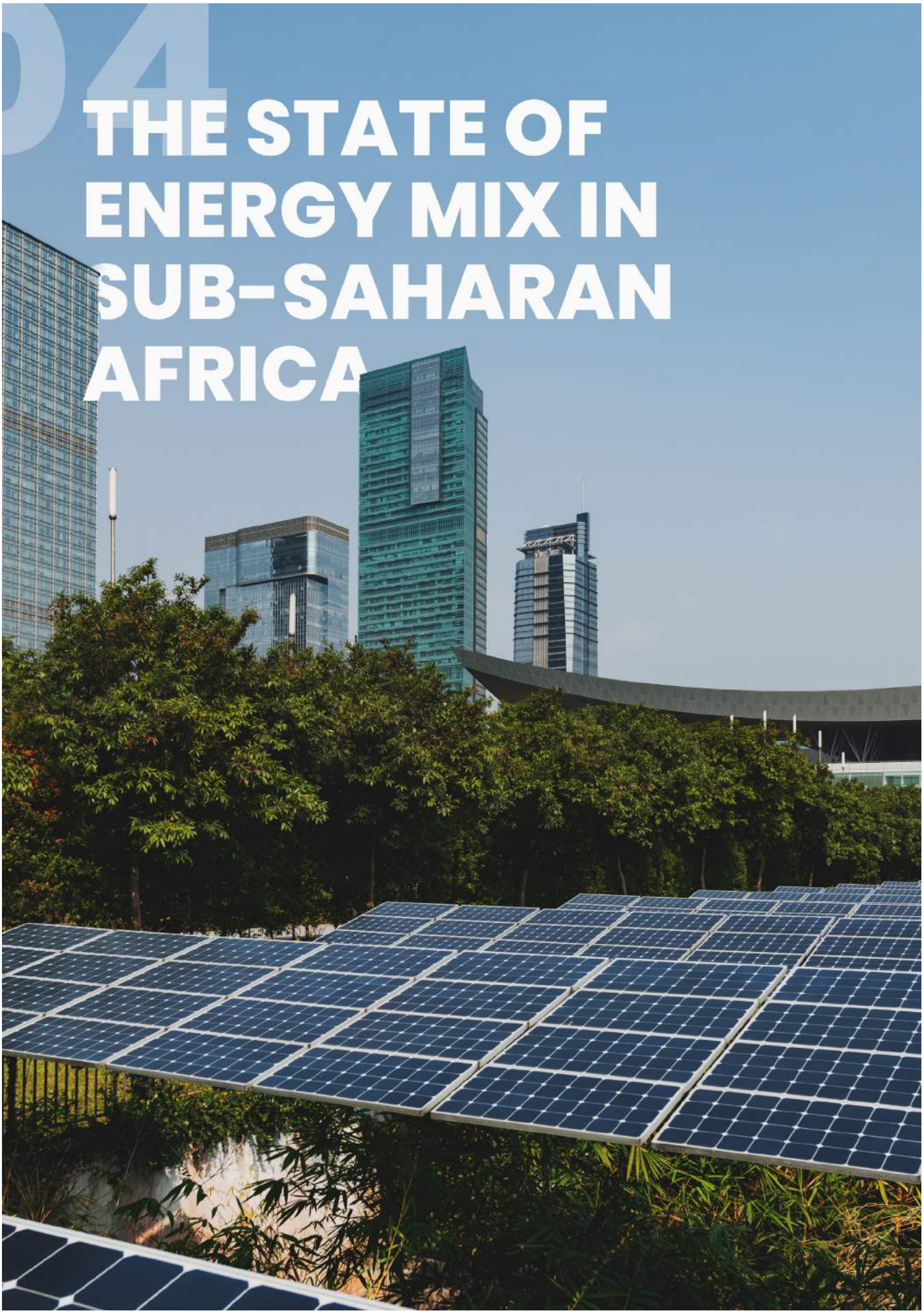
According to the International Labour Organisation (ILO), green jobs do not automatically constitute decent work. A job qualifies to be "green" if it meets the conditions of decent work as stipulated in the various ILO Conventions. This means a green job should have decent work qualities which include adequate wages, safe working conditions, and worker rights, including the right to organize labour unions.

However, global trends for jobs created in renewable energy sectors in the SSA region, for instance, in biofuel,waste and recycling sectors are often dirty and dangerous, causing significant damage to human health.

Employment in this industry also tends to be precarious, unprotected, without social security and with low wages below the poverty line, "poverty wages". Without incorporating decent work aspects, the green jobs created in renewable energy sectors will only perpetuate poverty rather than graduating workers out of poverty.

Hence, ILO's resolve that to be truly classified as "green jobs", labour conditions need to meet decent work criteria in order to uplift workers out of poverty. Provision of decent work is also one of the elements of a just transition for workers.

04 THE STATE OF ENERGY MIX IN SUB-SAHARAN AFRICA



A sustainable energy mix (as measured by the share of renewable energy in the total energy mix) is critical in meeting the needs of SSA citizens. Whilst coal represents the main energy source given its comparative costs with renewable energy; inadequate electricity generation remains a huge challenge in SSA.

In this context, renewable energy (RE) plays an important role in meeting the needs of a country in terms of sustainable development.

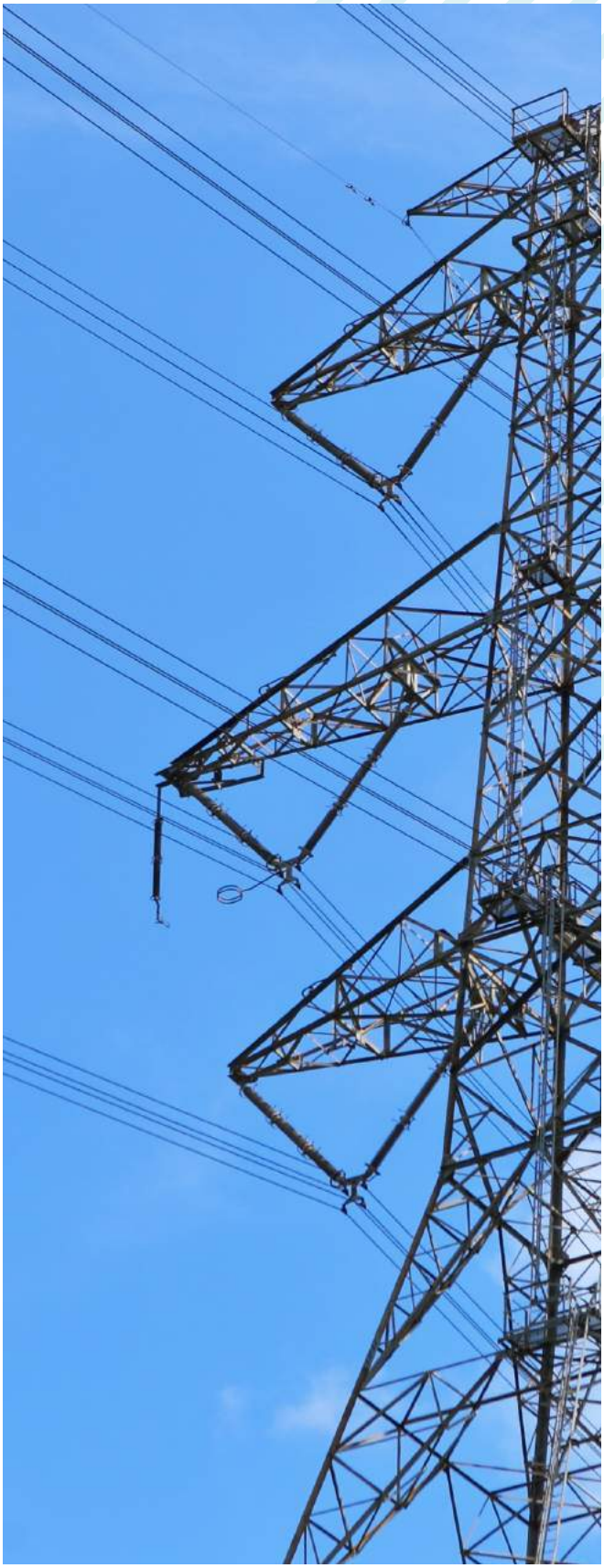
This is more so because SSA presents great energy resources and has great potential for developing RE such as wind, biomass, solar and hydro power which is distributed across its regions.

Table 4.1 shows the dashboard of sustainable energy for selected SSA countries.

Table 4.1: *Dashboard for sustainable energy for selected SSA countries*

Country	% of renewable energy in total final energy consumption
Ghana	41
Malawi	84
Nigeria	87
Tanzania	86
Senegal	43
South Africa	17
Zambia	88
Zimbabwe	82

Source: *USAID, 2019*



In terms of the energy mix (share of renewable energy in total final energy consumption), Ghana, Senegal and South Africa have less than 50 percent of renewable energy in their total final energy consumption. Meaning Malawi, Nigeria, Tanzania, Zambia and Zimbabwe have a better energy mix in their countries.

ELECTRICITY GENERATION MIX

Table 4.2: Electricity mix for selected SSA countries

COUNTRY	FOSSIL	WIND	SOLAR	HYDRO	NUCLEAR	GEOTHERMAL
Botswana	99.91	0.00	0.09	0	0.00	0.00
Eswatini	52.31	0.00	0.18	47.51	0.00	0.00
Cote d'voire	76.5	0.00	0.04	23.47	0.00	0.00
DRC	0.3	0.00	0.81	99.69	0.00	0.00
Gabon	56.3	0.00	0.09	43.59	0.00	0.00
Ghana	35.86	0.00	0.02	64.12	0.00	0.00
Malawi	1.38	0.00	0.00	98.62	0.00	0.00
Nigeria	80.08	0.01	0.06	19.87	0.00	0.00
Tanzania	63.62	0.00	0.27	36.11	0.00	0.00
Senegal	90.88	0.00	0.11	9.00	0.00	0.00
South Africa	93.44	0.00	0.30	0.52	5.43	0.00
Zambia	1.26	0.31	0.02	98.71	0.00	0.00
Zimbabwe	43.32	0.00	0.07	56.61	0.00	0.00
Total	**695.16**	**0.32**	**2.06**	**597.82**	**5.43**	**0**

Source: *The Global Economy, 2018* [3]

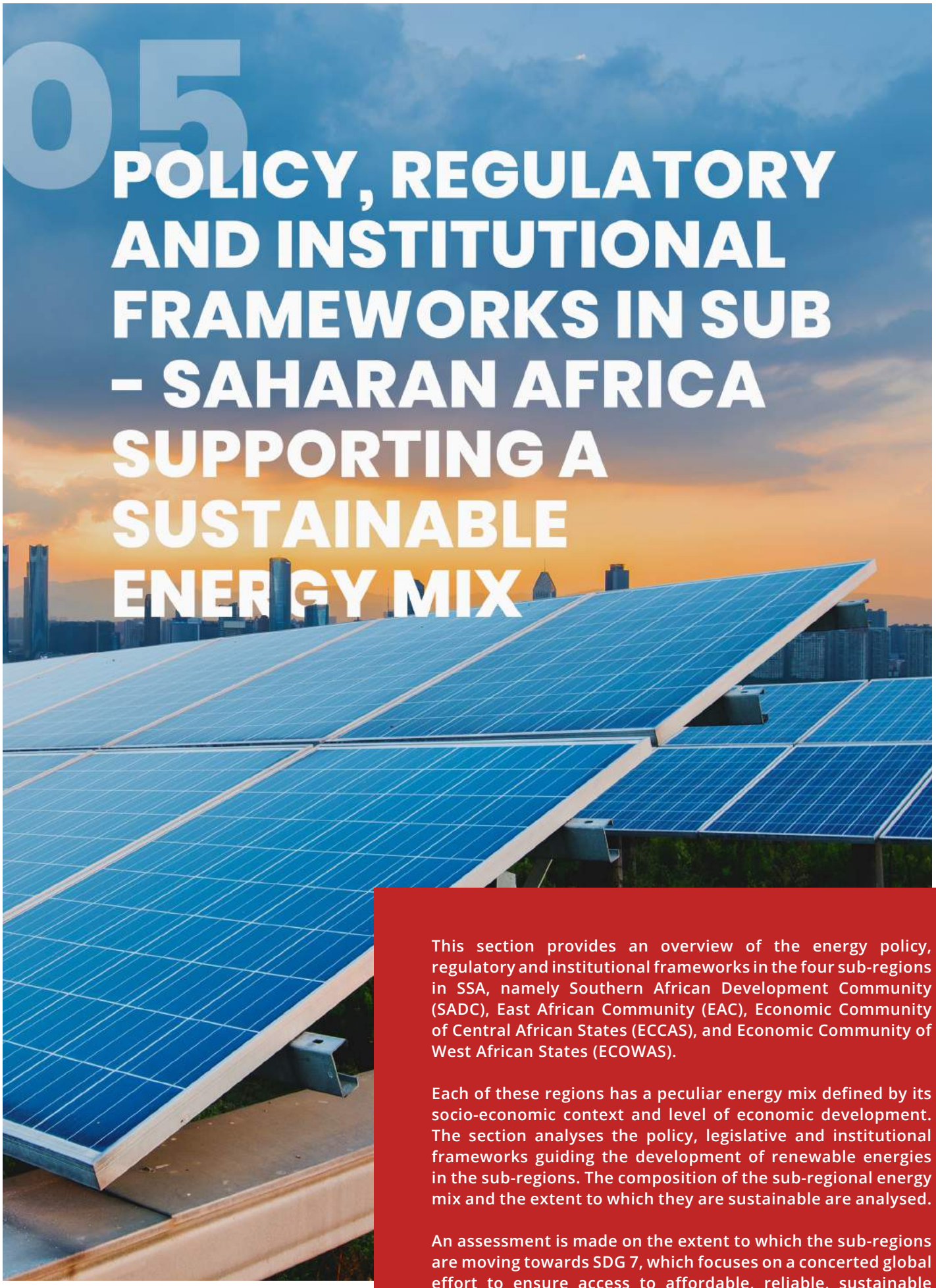
Table 4.2 shows how much electricity is generated from various energy sources in countries where IndustriALL in represented. Table 4.2 indicates that a greater percentage of the electricity in the SSA countries is produced from fossil fuels, compared to renewable sources.

However, among the renewable energies, hydroelectricity constitutes the highest share in the electricity mix.

[3] *https://www.theglobaleconomy.com/energy_mix.php?countryId=7*

05

POLICY, REGULATORY AND INSTITUTIONAL FRAMEWORKS IN SUB – SAHARAN AFRICA SUPPORTING A SUSTAINABLE ENERGY MIX



This section provides an overview of the energy policy, regulatory and institutional frameworks in the four sub-regions in SSA, namely Southern African Development Community (SADC), East African Community (EAC), Economic Community of Central African States (ECCAS), and Economic Community of West African States (ECOWAS).

Each of these regions has a peculiar energy mix defined by its socio-economic context and level of economic development. The section analyses the policy, legislative and institutional frameworks guiding the development of renewable energies in the sub-regions. The composition of the sub-regional energy mix and the extent to which they are sustainable are analysed.

An assessment is made on the extent to which the sub-regions are moving towards SDG 7, which focuses on a concerted global effort to ensure access to affordable, reliable, sustainable and modern energy for all. The assessment will provide trade unions with an entry point for appropriate action in terms of policy and legislation.

5.1 EAST AFRICAN COMMUNITY (EAC)

POLICY, LEGISLATIVE AND INSTITUTIONAL FRAMEWORKS AT EAC LEVEL

RENEWABLE ENERGY POLICY FRAMEWORK	**i.** Regional Strategy on Scaling-up Access to Modern Energy Services in the East African Community (2009). **ii.** Energy Security Policy Framework (2018)
RENEWABLE ENERGY REGULATORY FRAMEWORK	**i.** Treaty for the Establishment of the East African Community - Article 101 utilisation of various energy resources **ii.** Regulatory Indicator for Sustainable Energy (RISE)
RENEWABLE ENERGY INSTITUTIONAL FRAMEWORK	**i.** The institutional framework is defined in the Energy Security Policy Framework. It includes: • Establishment of inter-ministerial committee for biomass electricity and oil and gas supply security **ii.** EAC Centre of Excellence for Renewable Energy and Energy Efficiency (EACREEE) (2016)

REGIONAL STRATEGY ON SCALING-UP ACCESS TO MODERN ENERGY SERVICES IN THE EAST AFRICAN COMMUNITY

the objective was to ensure that EAC modern energy access targets are met, to enable Partner States to meet the Millennium Development Goals (MDGs).

THE ENERGY SECURITY POLICY FRAMEWORK

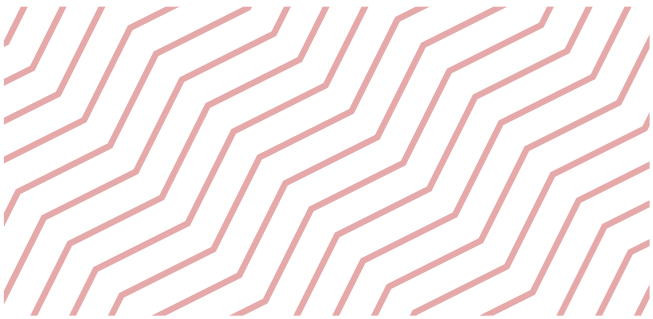
The Framework focuses on putting forth an approach for conceptualising, measuring, monitoring and managing energy security in the biomass, electricity, oil and gas sub-sectors. It further identifies the institutional and operational arrangements for ensuring energy security;

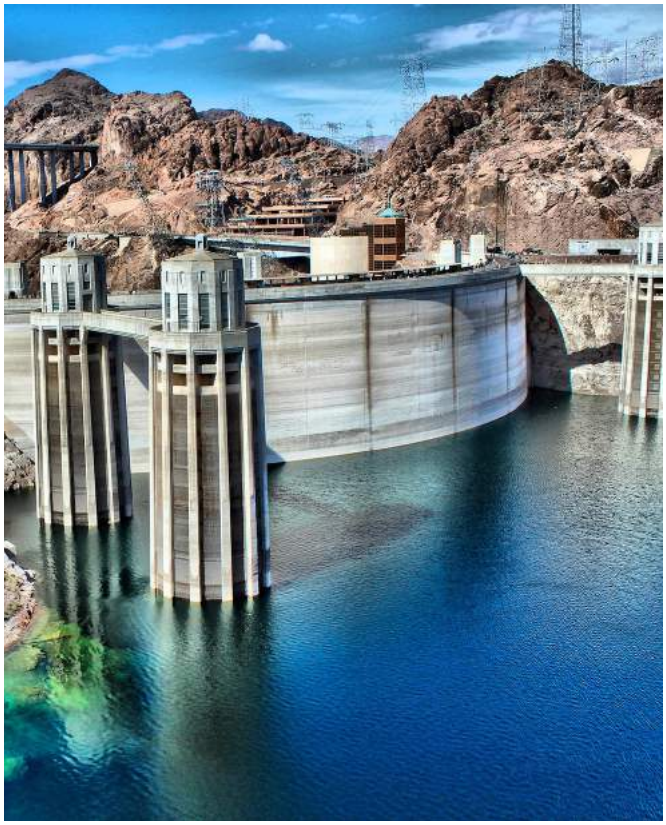
- The energy security framework for biomass energy identifies 11 dimensions in which action can restore the system to greater sustainability and security. These are: forest fires and crime management; efficient conversion technologies adoption; improving forest productivity,resource stocking; expanding energy plantations; forest health; alternative biomass access; land use and climate change management; value chain organisation and regulation; improving the efficiency of cooking technology and managing the effects of population and economic growth,

- Actions are recommended in all the 11 dimensions based on the developed oil and gas supply security framework to restore oil and gas supplies security. These are: exploration and development of oil and gas, market volatility and political risks management, reducing import dependence, maritime and inland transit security, conversion technologies and efficiency, domestic production capacity, refinery and distribution networks,; strategic petroleum reserves, fuel switching capacity, value chain organisation and regulation and demand restraint measures, and,

- Action in 10 of the 11 dimensions of the developed framework for supply security of electricity is necessary to increase electricity system resilience and security. These are: fuel and resources input supply stability, diversity of generation technology and entities, generation adequacy, reduction in stranded power capacity, reduction in power not supplied; interconnection capacity; the cost of electricity, planning capacity, market organisation and regulation, and demand-side management, including energy efficiency.

The Establishment of Committees at the country level is an opportunity for trade unions to be heard and get involved in the process of establishing an energy mix in their respective countries that will ensure that the jobs, rights and interest of workers are embedded in national policy





TREATY FOR THE ESTABLISHMENT OF THE EAST AFRICAN COMMUNITY - ARTICLE 101

states that: "Member States shall adopt policies and mechanisms to promote the efficient exploitation, development, joint research and utilisation of various energy resources available within the region". The energy sector in the region is organised into three sub-sectors, namely: (a) Power (including transmission and interconnectivity), (b) New and Renewable Energy Sources, Energy Conservation and Energy Efficiency, and, (c) Fossil fuels.

REGULATORY INDICATOR FOR SUSTAINABLE ENERGY (RISE)

It was launched by the Sustainable Energy for All Initiative (SEforAll) and the World Bank in February 2017. It provides country-wise overview of progress towards establishing the necessary policy and regulatory frameworks for sustainable energy.

By use of scores, RISE helps governments assess if the policy and regulatory framework in place is conducive to driving progress on sustainable energy, and pinpoints where more can be done to attract private investments.

RISE scores reflect a snapshot of a country's policies and regulations in the energy sector, organised by the three pillars of the SEforAll initiative: Energy Access, Energy Efficiency, and Renewable Energy.

EAC CENTRE OF EXCELLENCE FOR RENEWABLE ENERGY AND ENERGY EFFICIENCY (EACREEE):

The goal is to facilitate the creation of an enabling environment for renewable energy and energy efficiency markets and investments, in order to contribute towards (i) increased access of modern, affordable and reliable energy services, (ii) energy security, and, (iii) mitigation of negative effects (e.g. local pollution and GHG emissions).

POLICY, LEGISLATIVE AND INSTITUTIONAL FRAMEWORKS BY COUNATRY

STATUS OF SEFORALL COUNTRY ACTION IN THE EAC PARTNER STATES

01

BURUNDI

Developing an energy master plan including a renewable energy master plan under the SEforALL umbrella with support from the AfDB, EU and World Bank. The World Bank also is supporting the development of the SEforALL Investment Prospectus.

02

KENYA

Finalised the SEforALL Action Agenda and Investment Prospectus at the end of 2015 with support from the SEforALL Africa Hub. Working on the institutionalisation of the SEforALL process and implementation of the Agenda Action and Investment Prospectus.

03

RWANDA

Presented the Action Agenda to the Economic Cluster cabinet meeting at the end of 2015.

04

TANZANIA

Finalised the Action Agenda and Investment Prospectus at the end of 2015 with support from the SEforALL Africa Hub.

05

UGANDA

One of the first countries in Africa to finalise and adopt the Action Agenda in 2015 with support from the European Commission. Currently finalising the Investment Prospectus.

Source: *REN21 2016*

STATUS OF RENEWABLE ENERGY MIX IN EAC

The East African Community countries remain heavily dependent on traditional solid fuels such as wood and charcoal, especially for household-level cooking and heating. Traditional biomass accounts for an average of 80 percent of the energy consumption in EAC countries.

The share of biomass[4] in primary energy consumption is lowest in Kenya, at 68 percent and highest in Burundi, at more than 95 percent. The existing infrastructure (electricity distribution) predominantly serves urban centres hosting the minority of the population, while its majority, dispersed over large rural areas, has to satisfy its energy need largely through solid biomass (see Figure 4).

Hydropower is the dominant source in the electricity generation mix of Burundi, Kenya, and Uganda. However, Tanzania's major source of electricity is from fossils (63.62 percent), followed by Hydropower at 36.11 percent and solar at 0.27 percent (The Global Economy, 2018 [5]).

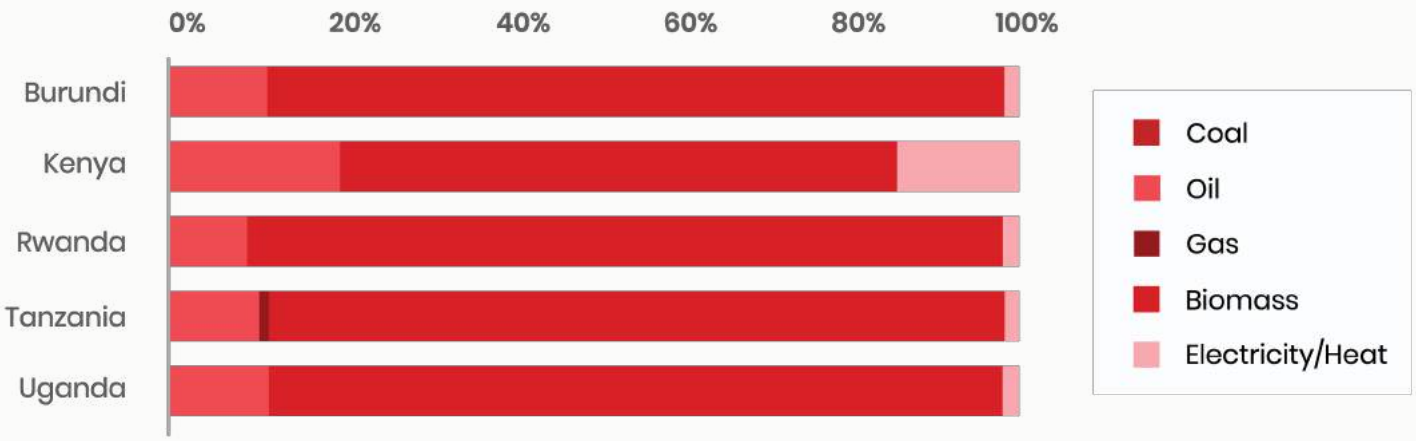
Concerning the electricity generation mix, it stands as follows:

- The bulk of the installed capacity of EAC is given by hydropower, with medium and large-sized dams (overall 3 GW) providing almost the entire power supply of the countries under analysis,
- Other renewables (solar, wind, geothermal, and biomass) display a penetration of:
    - 10 percent, with 600 MW of geothermal capacity in Kenya,
    - wind (e.g. the 310 MW Lake Turkana farm in Kenya), and,
    - solar (e.g. the 10 MW Tororo station in Uganda) recently, or is in the process of, coming on-line,
- Gas-fired generation is significant only in Tanzania (more than 700 MW operating). Diesel and HFO account for further 500 MW in EAC, and they play an important role in Kenya, where they account for roughly 25 percent of national generation,
- Significant plans exist for developing coal power plants in different countries, including Kenya,
- Installed coal generation capacity is currently very limited (0.25 GW of installed capacity).

[4] Biomass includes wood fuels, agricultural by-products, and dung, usually collected at the household level or traded in informal markets, and it is employed for the bulk of cooking, lighting, and heating activities.

[5] https://www.theglobaleconomy.com/energy_mix.php?countryId=74

Table 5.1: Primary Energy Mix in EAC countries



Source: M. Hafner et al, 2019

POLICY, LEGISLATIVE AND INSTITUTIONAL GAPS AND CHALLENGES

The achievement in the region developing policy, legal and institutional frameworks demonstrate high-level political support transitioning towards sustainable energy mix through increasing the share of the renewable energy mix. However, the following challenges need to be addressed:

i. The energy security policy framework is not a binding policy document for the region, making it challenging to get political will in implementing the policy at both the regional and national level.

ii. Whilst the policy framework is clear, progress towards renewable energy investment is hindered by the high costs of investment and high interest rates.

iii. The lack of clear targets for green job creation in the policy frameworks makes it difficult to monitor and evaluate the effectiveness of renewable energy policies in creating green jobs.

iv. The exclusion of trade unions at both national and regional levels in the design, implementation, monitoring and evaluation of the policies and programmes means their concerns and interests are not taken into consideration.

5.2 ECONOMIC COMMUNITY OF CENTRAL AFRICAN STATES (ECCAS)

POLICY, LEGISLATIVE AND INSTITUTIONAL FRAMEWORKS AT ECCAS

Renewable energy policy framework

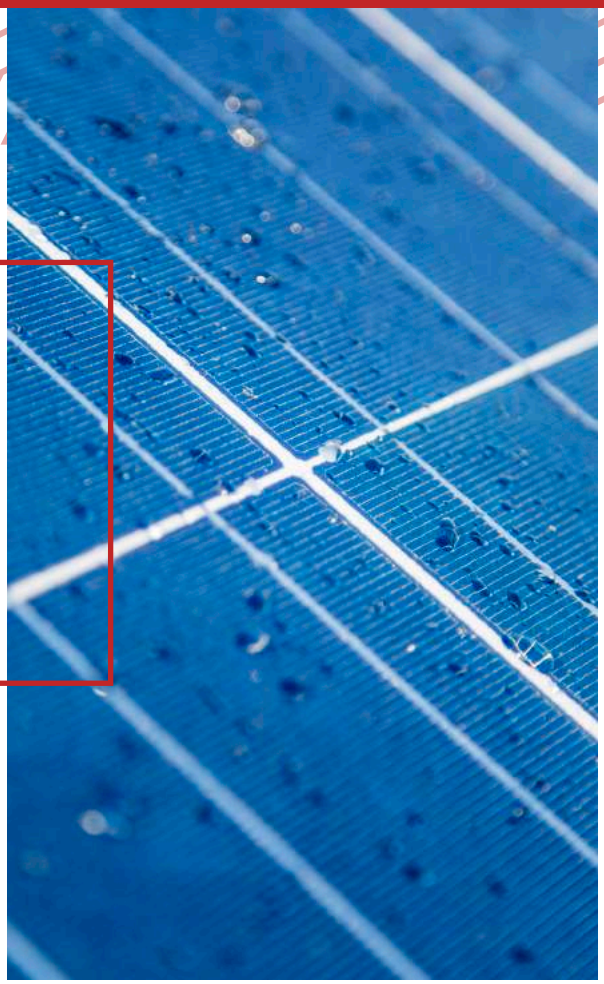
Central African Energy Policy for 2035

Renewable energy regulatory framework

Central African Electricity Procurement Code.

Renewable energy institutional framework

i. Central African Power Pool (CAPP)
ii. Fund for Central Africa's electricity sector



CENTRAL AFRICAN ENERGY POLICY

The policy is aimed at ensuring reliable, efficient energy infrastructure for the region's physical integration.

POLICY, LEGISLATIVE AND INSTITUTIONAL FRAMEWORKS BY COUNTRY

ANGOLA	Renewable Energy Strategy – Angola 2025 Energy Plan
CAMEROON	Vision 2035 - enhanced energy infrastructure Nationally Determined Contribution (NDC) - of achieving 25% renewable energy share in country's electricity mix by 2035. Electricity Sector Development Plan up to 2030 Master Plan for the development of renewable energy Energy Sector Development Plan (2030)
CENTRAL AFRICAN REPUBLIC	Energy policy 2004 focuses on renewable energy
CHAD	Energy Master Plan Act. No. 014/PR/99 which establishes the regulatory authority on energy

STATUS OF THE ENERGY MIX IN ECCAS

Despite a very high potential for hydroelectricity, Central Africa has low rates of access to modern energy (electricity, liquified petroleum gas, and kerosene). The region has huge fossil and renewable energy resources, but rural and semi-urban populations have limited access to energy.

This contrasts with the increase in the access-to-electricity rate noted in the continent and the world over the past decade. More specifically, Central Africa has less power grid interconnections than other African regions: with the exception of the planned electricity connections between Cameroon and Chad, DRC and Congo, and DRC and Angola, there are no links between countries in the region. Several power plants are currently being rehabilitated to boost energy capacity (e.g. Inga).

Table 5.1: *Electricity generation energy mix (%) (bn kilowatt-hours), 2017*

COUNTRY	FOSSIL	WIND	SOLAR	HYDRO	NUCLEAR	GEOTHERMAL
Chad	95.7	4.3	0.0	0.0	0.0	0.0
Cameroon	45.1	0.0	0.2	54.7	0.0	0.0
Central Africa Republic	16.7	0.0	0.0	83.3	0.0	0.0
Congo	63.9	0.0	0.0	36.1	0.0	0.0
Gabon	59.2	0.0	0.0	40.8	0.0	0.0
Equatorial Guinea	66.9	0.0	0.0	33.1	0.0	0.0
Sao Tome & Principe	88.9	0.0	0.0	11.1	0.0	0.0

Source: *Calculated from The Global Economy.com, 2019*

Table 5.1 indicates electricity mix is dominated by fossils. Out of the 7 countries, 6 have their electricity mix dominated by fossil with Chad being the highest at 95.7 percent, followed by Sao Tome and Principe at 88.9 percent, Equatorial Guinea at 66.9 percent, Congo at 63.9 percent, Gabon 59.2 percent. Only Central Africa Republic has a high concentration of renewable energy in its electricity mix at 83.3 percent, followed by Cameroon at 54.7 percent.

POLICY, LEGISLATIVE AND INSTITUTIONAL GAPS AND CHALLENGES

Compared with other regions, the ECCAS has a weak policy, legislative and institutional frameworks. This is compounded by the fact that the region has less power grid interconnections than other SSA sub-regions.

5.3 ECONOMIC COMMUNITY OF WEST AFRICAN STATES (ECOWAS)

POLICY, LEGISLATIVE AND INSTITUTIONAL FRAMEWORKS AT ECOWAS

Renewable energy policy framework

Energy Policy (revised in 1993)
ECOWAS Renewable Energy Policy (2013)
ECOWAS Energy Efficiency Policy (EEEP) (2013)

Renewable energy regulatory framework

West African Power Pool (WAPP) - 1999
ECOWAS Energy Protocol in 2003

Renewable energy institutional framework

Energy Centre for Renewable Energy and Energy Efficiency (ECREEE), 2010

ENERGY POLICY

envisioned the need for member countries to harmonise and coordinate their energy policies to promote greater integration and collective energy autonomy.

ECOWAS RENEWABLE ENERGY POLICY AND ECOWAS ENERGY EFFICIENCY POLICY (EEEP)

Were established to create a favourable environment for investments in clean, efficient and renewable energy technologies. This policy on renewable energy aims at ensuring increased use of renewable energy sources such as solar, wind, small-scale hydro and bioenergy for grid electricity supply and for the provision of access to energy services in rural areas.

The policy also aims to assist the ECOWAS countries to develop appropriate regulatory frameworks for the promotion of renewable energy technologies and services, thus reinforcing regional integration in the renewable energy sector.

WEST AFRICAN POWER POOL (WAPP)

It was established to deal with the energy crisis in the region. A Master Plan was adopted to provide the overall strategy and framework for preparing and implementing all WAPP priority projects tailored to the conditions in the West African energy market.

ECOWAS ENERGY PROTOCOL

Focuses on the improvement of energy efficiency and increased use of renewable energy sources.

ENERGY CENTRE FOR RENEWABLE ENERGY AND ENERGY EFFICIENCY (ECREEE)

It was established to contribute to the sustainable economic, social and environmental development of West Africa by improving access to modern, reliable and affordable energy services, energy security and reduction of negative environmental externalities of the energy system (e.g. GHG emissions, local pollution).

POLICY, LEGISLATIVE AND INSTITUTIONAL FRAMEWORKS BY COUNTRY

COUNTRY	Renewable energy policies			
	Renewable energy in energy policy	Specific renewable energy policy	Renewable energy development plans	Renewable energy grid-connected targets
Benin	National Energy Policy	N/A	N/A	37% of renewable energy penetration in 2025
Burkina Faso	National White Paper on Provision of Energy by 2020	N/A	N/A	N/A
Cape Verde	National Energy Policy	Decree- Low number 1-2011- Renewable Energy Incentive Policies	Decree- Low number 1-2011- Renewable Energy Incentive Policies	50% of grid renewable energy penetration by 2020
Cote d'Ivoire	N/A	N/A	Decree- Low number 1-2011- Renewable Energy Incentive Policies	N/A
Gambia	National Energy Policy	Renewable Energy Policy	Decree- Low number 1-2011- Renewable Energy Incentive Policies Decree- Low number 1-2011- Renewable Energy Incentive Policies	35% of renewable energy penetration by 2020 and 48% renewable energy penetration by 2030
Ghana	National Energy Policy Renewable energy master Plan (2019-2030)	Renewable Energy Act	Energy Sector Strategy & Implementation Plan	10% of renewable energy penetration by 2020
Guinea	Energy Sector Policy	Renewable Energy Policy	N/A	N/A
Guinea-Bissau	N/A	N/A	Energy Master Plan & Plan for infrastructure Development for the electricity centre	N/A
Liberia	National Energy Policy	Renewable Energy and Energy Efficiency Policy	Renewable Energy and Energy Efficiency Policy	N/A
Mali	National Energy Policy & National Energy Sector	N/S	Renewable Energy and Energy Efficiency Policy	N/A
Niger	National Energy Policy	Renewable Energy Strategy	Renewable Energy and Energy Efficiency Policy	20% of renewable energy penetration by 2020
Nigeria	National Energy Policy & Electric Power Sector Reform Act	N/A	Renewable Energy Master Plan	18% of renewable energy penetration by and 20% of renewable energy penetration by
Senegal	Electricity Bill	Renewable Energy Law	N/A	15% of renewable energy penetration by
Sierra Leone	National Energy Policy	N/A	N/A	N/A
Togo	N/A	N/A	N/A	N/A


industri all
global union

In line with the renewable energy agenda, the Government of Senegal established the National Renewable Energy Agency (ANER) in 2013. Its mission is to promote and develop alternative energies, in all their forms: solar energy, wind energy, biomass, tidal power and small hydropower (Afrik 21, 2019). This has resulted in the construction of the largest wind farm in Dakar and West Africa (expected to be completed in 2020). When completed, it is expected to generate about 15 percent of the country's electricity production.

STATUS OF RENEWABLE ENERGY MIX IN ECOWAS

West Africa's energy mix comes from three primary sources of wood fuel (firewood and charcoal), petroleum and electricity. The traditional biomass accounts for 80 percent of the domestic energy needs of the population.

Table 5.2: *Total on-grid energy generation and renewable generation (MWh) in the ECOWAS region in 2017*

COUNTRY	Total generation MWh	Renewable energy generation (including large and medium hydropower) MWh	Renewable energy generation (excluding large and medium hydropower) MWh	Renewable energy generation (including large and medium hydropower)-%	Renewable energy generation (excluding large and medium hydropower) MWh- %
Benin	227,528	1,215	1,215	0.5%	0.5%
Burkina Faso	1,096,038	138,136	138,136	12.6%	12.6%
Cabo Verde	490,945	82,951	82,951	16.9%	16.9%
Côte d'Ivoire	9,941,000	3,480,000	222,000	35.0%	2.2%
Gambia	313,709	33	33	0.0%	0.0%
Ghana	14,069,000	5,644,000	28,000	40.1%	0.2%
Guinea	2,587,730	1,212,055	187,874	46.8%	7.3%
Guinea-Bissau	90,507	0	0	0.0%	0.0%
Mali	133,442	109,900	0	82.4%	0.0%
Liberia	2,081,400	809,044	38,886	38.9%	1.9%
Niger	299,973	0	0	0.0%	0.0%
Nigeria	31,294,886	7,612,736	n/a	24.3%	n/a
Senegal	3,566,621	82,744	82,744	2.3%	2.3%
Sierra Leone	300,000	n/a	n/a	n/a	n/a
Togo	893,680	208,845	4,295	23.4%	0.5%
Regional	67,386,459	19,381,659	786,134	28.8%	1.2%

Source: *ECREEE, 2019*

Despite the enormous renewable energy resources available in the region, such as hydro, solar, and wind, less than 30 percent of the population has access to electricity or the services it provides. Most of the ECOWAS countries do not have petroleum resources and rely on imported products for domestic consumption.

In Table 5.2 countries such as Senegal, Burkina Faso and Sierra Leone, made considerable steps to increase installed renewable energy capacity. The share of on-grid renewable energy capacity in 2017, including medium and large hydropower power plants installed in the region, was 24.3 percent versus a target of 35 percent by 2020.

The share of on-grid renewable energy capacity in 2017 excluding medium and large hydropower power plants installed in the region only amounted to 1.8 percent versus a 2020 target of 10 percent.

WEST AFRICAN SUMMIT ON RENEWABLE ENERGY (2017)

In 2017, in Dakar (Senegal), the National Renewable Energy Agency (ANER) of Senegal in partnership with the Vale Media Group hosted the first edition exhibition on Renewable Energies. The summit was attended by regional and national institutions of the ECOWAS under the theme "Meeting the technological, financial and regulatory challenges to achieve the energy objectives of ECOWAS". The summit focused on investment in renewable energy projects and opportunities that exist in the energy sector.

Source: ANER, 2018.

POLICY, LEGISLATIVE AND INSTITUTIONAL GAPS AND CHALLENGES

The following are challenges being faced in the region in harnessing the full potential of renewable energy:

i. Whilst policy, legislative and institutional frameworks are clear at a regional level, the majority of the countries such as Cape Verde, Gambia, Ghana, Senegal, Niger, Nigeria and Sierra Leone are striving to mainstream renewable energy into their national energy policies, thus limiting progress towards sustainable energy mix

ii. Despite the clear frameworks at the regional level, there are still substantial gaps in terms of workable tools and measures to implement these policies. For example, there are no standard instruments such as feed-in tariffs to sell electricity on the grid or power purchase agreements (PPA) adapted to renewable energy power generating plants.

iii. Limited public financing in renewable energy investments which leads to an ad-hoc path towards sustainable energy mix (ECOWAS, 2015).

iv. Provision of subsidies towards fossil energy undermines the development of renewable energy.

5.4 SOUTHERN AFRICAN DEVELOPMENT COMMUNITY (SADC)

POLICY, LEGISLATIVE AND INSTITUTIONAL FRAMEWORKS SADC LEVEL

Southern Africa is relatively well-endowed with vast energy potential (renewable and non-renewable) SADC has set to a target to achieve a renewable energy mix in the regional grid of at least 32 percent by 2020 and 39 percent by 2030. Below is the SADC's renewable energy policy, legal and institutional frameworks.

Renewable energy policy framework

iii. SADC Energy Protocol (1996);

iv. Regional Infrastructure Development Master Plan: Energy Sector Plan (2012);

v. SADC Industrialization Strategy and Roadmap (2015);

vi. Revised RISDP (2015-2020);

vii. Regional Energy Access Strategy and Action Plan; and AU Agenda 2063.

viii. Renewable Energy and Energy Efficiency Strategy and Action Plan (REEESAP): 2016-30

Renewable energy regulatory framework

i. Regional Electricity Regulators Association of Southern Africa (RERA);

ii. Southern African Power Pool (SAPP).

Renewable energy institutional framework

i. SADC Centre for Renewable Energy and Energy Efficiency (SACREEE) - 2016

Source: *SADC Energy Monitor, 2018*

POLICY, LEGISLATIVE AND INSTITUTIONAL FRAMEWORKS AT COUNTRY LEVEL

Table 5.3 indicates that SADC countries were making headway in terms of providing the policy and regulatory environment to support renewable energy deployment.

Table 5.3: *Renewable energy policies in selected SADC countries*

COUNTRY	Policy/Strategy/ Institution	Year Adopted
Angola	New Renewables Strategy	2017
Botswana	Botswana Regulatory Energy Authority	2017
Lesotho	Renewable Energy Feed in Tariff (REFiT) Country Partnership Framework (CPF) National Strategic Development Plan	2016 2016 2016
Malawi	Independent Power Producer (IPP) Framework for Malawi	2017 2017
Mauritius	Mauritius Renewable Energy Agency (MARENA)	2016
Mozambique	REFiT	2016
Namibia	National Renewable Energy for Namibia Namibia REFiT	2016 2014
Seychelles	Small Island Developing State (SIDS) Dock Support Exemption from goods and services tax	2016
South Africa	Renewable Energy Independent Power Producer Framework Procurement Programme (REIPPPP) Regulatory Framework PPAs and IPPs	2016 2016 2016
Tanzania	Sustainable Use of Natural Resources and Environment Finance Small Enterprise Finance Agent (SEFA)	2017 2016
Zambia	REFiT Office of Promoting Private Power Investment (OPPI) Scaling Up Solar project	2015 2015 2016
Zimbabwe	National Renewable Energy Policy National Biofuels Policy	2019 2020

Source: *SADC Energy Monitor, 2018 and others*

STATUS OF RENEWABLE ENERGY MIX IN SADC

In 2017, the region's electricity generation mix was largely unsustainable as it was dominated by fossils, mainly coal (62.05 percent) and distillate (4.38 percent). The leading countries with fossils as a major share of electricity generation include; Botswana, Eswatini, Tanzania, South Africa and Zimbabwe (Figure 5.3).

Coal is expected to contribute the highest source of new electricity generation capacity in the region between 2017 and 2022 at 36 percent. Clearly, the electricity mix for the region will largely be dominated by coal indicating slow progress towards transitioning towards a sustainable mix.

In terms of renewable energy, hydropower constitutes the largest share in electricity generation (21 percent), followed by wind (4.03 percent), nuclear (3.01 percent), and, solar PV (2.94 percent). The major contributors to hydropower in the region are DRC, Malawi, Mozambique, Zambia and Zimbabwe (Figure 5.4).

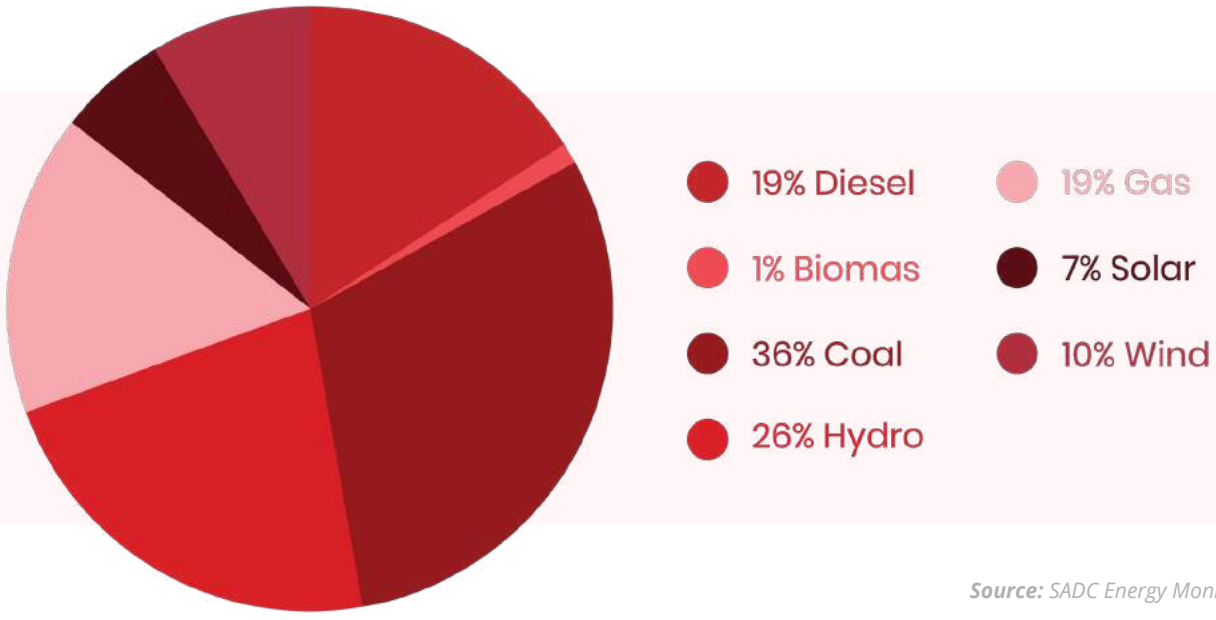
Hydropower is expected to contribute 26 percent of new generation capacity in the region between 2017 and 2022.

However, hydropower in Southern Africa is facing challenges due to the changing climate conditions characterised by droughts and unpredictable rainfall patterns, thus threatening water resources availability and usage across the region.

Wind energy is not evenly distributed in the region, with South Africa being the major contributor and other actors being Namibia, Mozambique, Mauritius and Zambia where feasibility studies were being undertaken (SADC, 2018). Wind is expected to contribute 10 percent of new generation capacity in the region between 2017 and 2022.

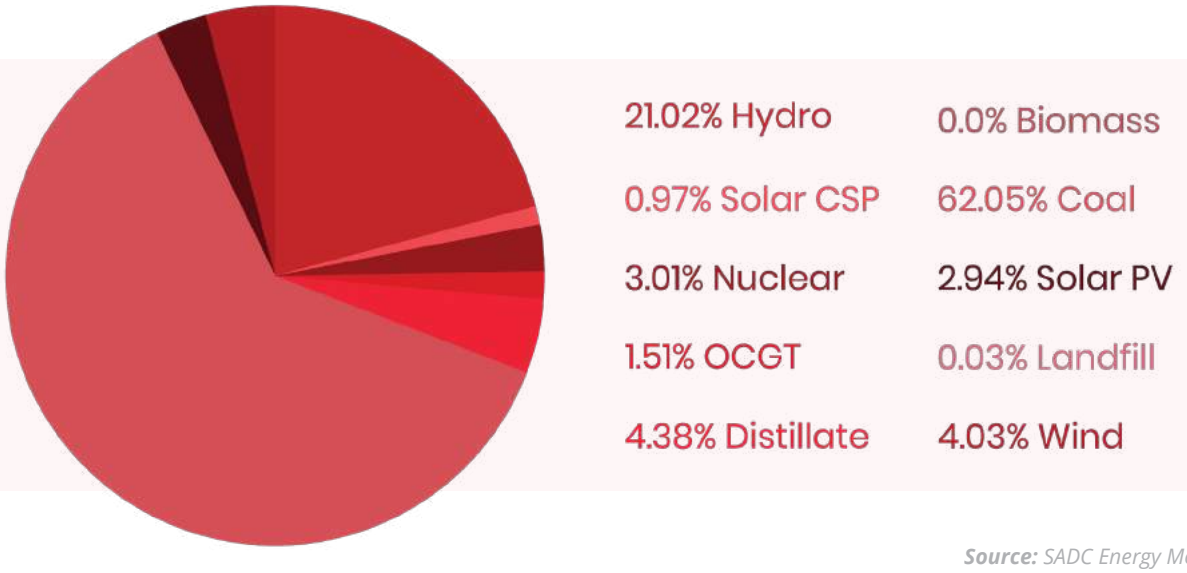
Solar, is one of the abundant resources in the region, with South Africa and Namibia leading in on-grid solar power. Off-grid solar power is largely driven by independent Power Producers (IPPs). In 2017, global off-grid solar PV market was estimated at US$300 million, with the strongest growth in SSA region, followed by Asia (SADC, 2018). Solar is expected to contribute 7 percent of new generation capacity in the region between 2017 and 2022.

Figure 5.3: *New Generation Capacity, MW: 2017-2022*



Source: *SADC Energy Monitor, 2018*

Figure 5.4: *SADC Regional Electricity Generation Mix*



Source: *SADC Energy Monitor, 2018*

Biomass is by far the primary source of energy in most SADC Member States. Traditional biomass such as wood and charcoal accounts for more than 45 percent of final energy consumption in the region (SADC Renewable Energy and Energy Efficiency Status Report, 2016).

The use of biomass, however, varies by country, with some Member States exceeding 70 percent in terms of the contribution of traditional biomass to energy consumption. This is the case for the Democratic Republic of Congo (DRC), Mozambique, Tanzania and Zambia, where it accounts for at least 60 percent of energy consumption (ibid).

In 2017, SADC agreed to establish a regional natural gas committee to promote the inclusion of gas in the regional energy mix and in the promotion of industrial development in the region following huge discoveries of gas deposits in the region (Box 5.1).

The Terms of Reference for the proposed Inter-State Gas Committee were agreed by the SADC Energy (Electricity and Petroleum Gas) Subcommittees in 2018. The promising petroleum and gas sub-sector is still to be explored as the costs for embarking on such projects are still out of reach for most of the Member States.

POLICY, LEGISLATIVE AND INSTITUTIONAL GAPS AND CHALLENGES

Clearly, the region has made huge strides in developing regional policy frameworks and national framework, there exists other challenges inhibiting the region from harnessing the full potential of renewable energy.

POLICY	• Absence of nuclear, renewable energy and energy efficiency targets in policies of some of the countries • Limited conducive policy instruments (like IPP Frameworks –operational in South Africa and Zimbabwe, and being developed in Zambia; • Absence of a "one-stop shops" providing all information and services required by potential investors • Absence of green jobs targets in line with national policies
REGULATORY	• Inadequate regional harmonisation and standardisation of grid codes and Power Purchase Agreements (PPAs) to simplify power trade and contracts for private sector participation
INSTITUTIONAL	• Lack of involvement of key stakeholders such as workers' organisations; • Limited and at times no participation of a broad spectrum of private and public actors, including development finance institutions, trade unions, climate finance institutions, private equity funds, institutional investors, export credit agencies and green, commercial banks, employers and workers organisations • Limited capacity of statistical agencies to focus on data collection in renewable energy to inform policy.
CAPACITY	• Low levels of education and skills development, especially green skills • Underdeveloped financial sectors to fully support renewable energy policies • High poverty, which undermines the capacity of poor households to invest in thepurchase of renewable energy policies. • Most of the renewable energy projects require medium to long term funding which is not available on the domestic financial markets of the countries in the region. The Independent Power Producers (IPPs) bemoaned that the domestic financial sector players were taking long to understand and appreciate the need to support the renewable energy sector financially.

Source: *SADC, 2018*

Box 1: Discovery of gas and oil in SADC regioniii.

According to the 2016 SADC Energy Monitor:

i. Angola, Mozambique and Tanzania are extracting natural gas commercially,

ii. Angola is the only one extracting crude oil commercially,

iii. DRC, Madagascar and Namibia discovered large deposits of natural gas but were still in the process of developing towards commercial extraction,

iv. South Africa has discovered large deposits of shale gas,

v. Botswana, Mozambique and Zimbabwe had discovered large deposits of Coal Bed Methane (CBM) gas but were still in the process of developing towards commercial extraction, and

vi. DRC and Madagascar had discovered significant deposits of oil but were still developing towards commercial extraction.

Source: *SADC, 2018*

06

INDUSTRIALL AFFILIATE COUNTRIES' POLICY AND REGULATORY FRAMEWORKS TOWARDS A SUSTAINABLE ENERGY MIX

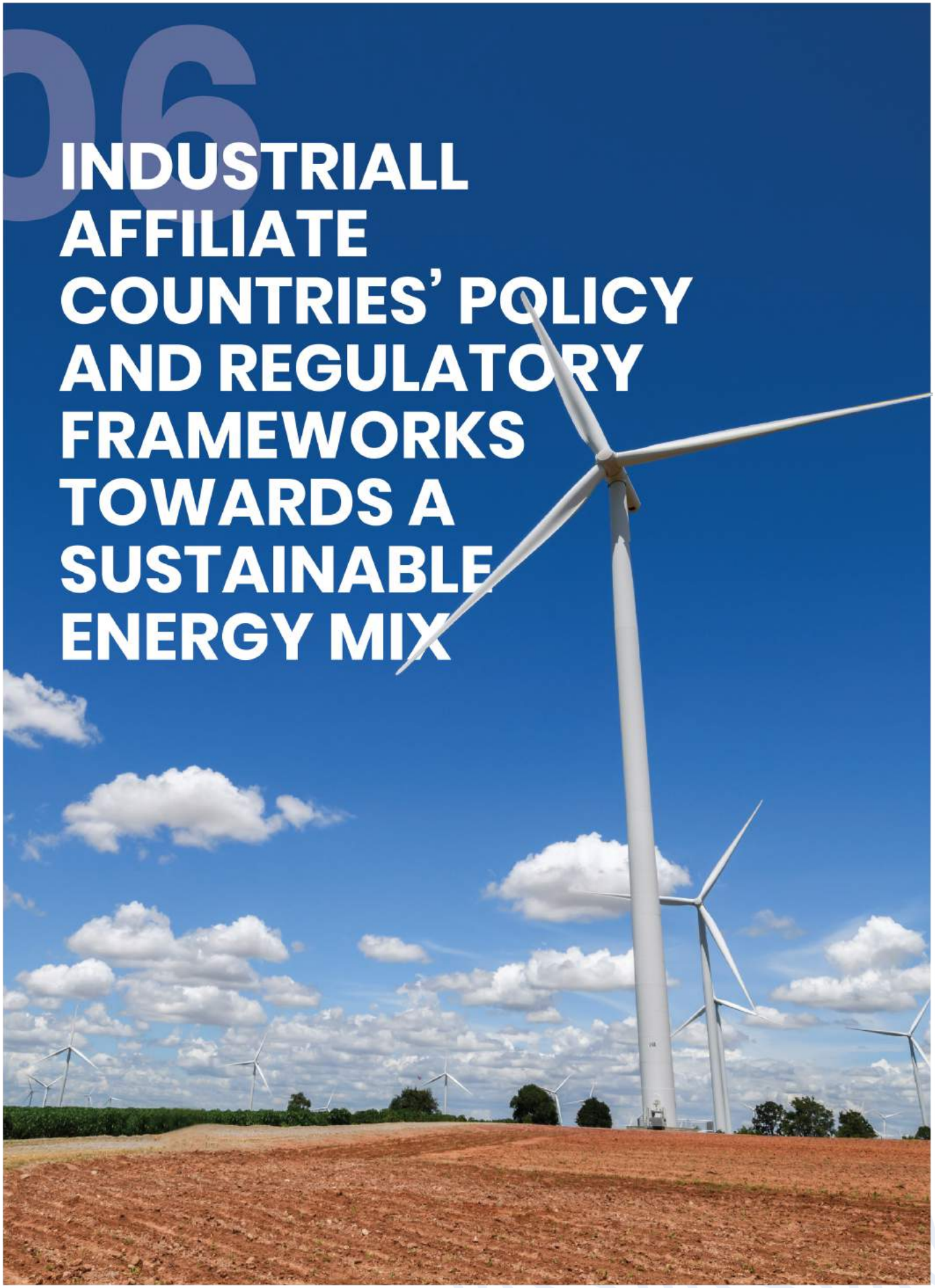


Table 6.1 shows the various existing policy and legislative frameworks related to renewable energy technology in selected countries that IndustriALL operates.

Table 6.1: *Key National Energy Policy Frameworks in Selected SSA Countries*

BOTSWANA

LONG TERM DEVELOPMENT PLAN/S	**Botswana's Vision 2036** • Overall aim to achieve a high-income status • The vision consists of four pillars: Sustainable Economic Development, Human and Social Development, Sustainable Environment and Good Governance, Peace and Security **National Development Plan (NDP) 11 (2017-2023)** • Identifies renewable energy as a contributing element to address the country's energy security concerns as well as its climate change targets. • The NDP highlights solar power as a promising off-grid solution and indicates that electricity subsidies will continue in low income urban, semi-urban, and rural areas.
ENERGY POLICY FRAMEWORK	**Botswana Energy Master Plan (1996, reviewed 2003** • Outlines various goals for rural electrification including the efficient use of renewable energy; • Highlights government promotion of solar energy, off-grid solutions, and grid extension, in add ition to the removal of investment barriers and the creation of appropriate institutional frameworks.
RENEWABLE ENERGY POLICY / PLAN/ STRATEGY	**Biomass Energy Strategy (2009)** • Outlines biomass energy demand, woody and non-woody biomass supply, potential interventions, and a comprehensive strategy for the utilization of biomass energy resources.
LEGISLATION RELATED TO RENEWABLE ENERGY	**Electricity Supply Act (1973, amended in 2007)** • **Allows for the** participation of Independent Power Producers (IPPs), with generation and supply governed by licenses issued under the Ministry of Minerals, Energy and Water Resource; • Allowances are in place for governmental departments and generators operating at less than 25 kW of capacity.

GHANA

LONG TERM DEVELOPMENT PLAN/S	**Long-term Development Plan (2018-2057)** **Ghana Strategy Paper (2019-2023)** • The Strategy paper focuses on the implementation of the Renewable Energy Master Plan (2019-2030).
ENERGY POLICY FRAMEWORK	**National Energy Policy (2010)** The policy aims at: • Creating a conducive environment for increased energy investment in the energy sector; • Increasing the proportion of renewable energy in the total national energy mix and ensure its efficient production and use; • Identification of the high cost of renewable energy technologies as one of the major challenges to their adoption; • Developing policy direction to improve the cost efficiency of solar and wind technology; • Improving the production and promoting the efficient use of biomass in the short-term while increasing regeneration, switching from the use of biomass to alternative sources of energy; • Creating fiscal and pricing incentives to enhance the development and use of renewable energy.
RENEWABLE ENERGY POLICY / PLAN/ STRATEGY	**Renewable Energy Master Plan (2019-2030)** • The targets are to increase the penetration of renewable energy in national energy generation mix from 42.5 MW (2015) to 1363.63MW • It focuses on the reduction of dependency on biomass as the main fuel for thermal energy applications; • It provides renewable energy-based decentralised electrification options in 1,000 of off-grid communities. • It promotes local content and local participation in the renewable energy industry.
LEGISLATION RELATED TO RENEWABLE ENERGY	**Renewable Energy Act 2011 (Act 832)** • The Act aims at creating an enabling regulatory environment to attract private sector involvement in the development, management and utilisation of renewable energy in an efficient and environmentally sustainable manner.

GABON

LONG TERM DEVELOPMENT PLAN/S	N/A
ENERGY POLICY FRAMEWORK	**Strategic Action Plan for the Development of the Electricity Sector (2011-2030)** • Government intends to develop a balanced energy portfolio by encouraging the production of new and renewable energy sources. • Out of the additional 1,500 MW capacity that the country plans to commission by 2020, hydroelectric and thermal power plants developed by private operators account for around 85%. • Renewable energy is planned to constitute 5% of the supply mix by 2015, 15% by 2020 and 20% by 2030. **Programme for Investment in Energy Access Services (PNIASE-CI) (2012)** • Le programme national d'investissement pour l'accès aux services énergétiques en Côte d'Ivoire (PNIASE-CI – National Programme for Investment in Energy Access Services) has three components which are access to electricity; access to modern cooking energy; and access to diesel energy. The components consist of five sectoral sub-programmes: agriculture, education, energy, water and health.
RENEWABLE ENERGY POLICY / PLAN/ STRATEGY	**Renewable Energy Investment Incentives** • The government of Côte d'Ivoire provides reductions in sales, energy, VAT and other taxes for renewable energy. **Sustainable Use of Natural Resources and Energy Financing (SUNREF) (2014)** • Facility provides support to local and regional financial institutions to finance small and medium-size private renewable energy and energy efficiency projects.
LEGISLATION RELATED TO RENEWABLE ENERGY	**Electricity Law (1985)** • The law liberalised the electricity market and ushered in opportunities for three IPPs entered into power generation, BUT the transmission, distribution, import and export activities of electricity remained a state monopoly **Electricity Code (2014)** • The purpose of the code is to take into account new and renewable energy sources.

SENEGAL

LONG TERM DEVELOPMENT PLAN/S

Plan for an Emerging Senegal (PES)
- Government expects increased generation capacity
- Targeting 15% RE in Senegal's energy generation mix by 2025

There is a further objective of achieving 25% of renewable energy in the mix by 2030

ENERGY POLICY FRAMEWORK

Lettre de Développement du Secteur de l'Énergie (LPDSE) (2012)
The main targets on energy mix include developing a policy mix that combines thermal generation, bio-energy, coal, gas and renewables, and seizing opportunities for regional interconnections; IPPs growth and increasing share of hydropower through the participation in regional cooperation projects such as the Western Africa Power Pool (WAPP)

RENEWABLE ENERGY POLICY / PLAN/ STRATEGY

National Action Plan for Renewable Energies (PANER) (2011)
- It defines the targets for renewable energy injected into the grid in 2020, 2025 and 2030.
- In 2020: target a share of 10% or 400 MW for renewables in the country's electricity mix by 2020 with other sources mentioning even higher targets.
- In 2025: (i) Power of 440 MW from different sources (PV and wind); (ii) Penetration rate of 30%; and (iii) No constraints to evacuate the total power according to the results of the integration study of the REs taking into account the planned network at this date.
- In 2030: (i) Power of 550 MW from different sources (PV and wind); (ii) Penetration rate of 30%; and (iii) Need to reinforce the 90 kV (Cap-Des-Biches - Kounoune) transmission network and the installation of a third 225/90 kV transformer of 200 MVA.

LEGISLATION RELATED TO RENEWABLE ENERGY

Renewable Energy Act (2010) supported by two decrees:

Decree No. 2011-2013:

- Provides conditions of power purchase and remuneration for electricity generated by renewable energy plants and the conditions of their connection to the grid.
- It also contains elaboration on renewable power purchase obligation and feed-in tariffs for different renewable energy technologies.

Decree No. 2011-2014:

- It specifies the conditions for purchasing surplus renewable electricity from self-producers.
- It also sets the maximum intake from renewable energy sources (variable power), the purchase price, as well as conditions for purchases of surplus energy and connection to the grid.

SOUTH AFRICA

LONG TERM DEVELOPMENT PLAN/S

National Development Plan – 2030
It focuses on the implementation of the 2010 Integrated Resource Plan

ENERGY POLICY FRAMEWORK

Integrated Resource Plan (IRP) (2019) [6]

- The IPR is expected to replace some of South Africa's reliance on coal with renewable energy. The IRP will reduce the coal reliance from 85% of South Africa's electricity generation to 59% with solar contributing 18% and wind 6%.
- Ensuring a Just Transition in the energy mix strategies is amongst the 10 decisions under the IPR. Section 5.3.2 states that: "In order to ensure a socially just transition, the engagement process must commence to put in place the plans and interventions that mitigate against adverse impacts of the plant retirement programme on people and local economies."

White Paper on Energy Policy (1998)

- The fifth objective addresses the need to provide alternative sources of energy, including renewable. It recognises the potential of renewable energy in securing supply through diversity
- Noted that the Government should not only increase its capacity to address the need of the day, but also improve long term issues, such as the development of renewable energy resources to achieve a more sustainable mix.

RENEWABLE ENERGY POLICY / PLAN/ STRATEGY

Renewable Energy Independent Power Project Procurement Program (REIPPPP)
It relies on private sector actors – as opposed to the South African government – to realise renewable energy projects.

White Paper on Renewable Energy Policy (2003)

- Fosters the uptake renewable energy in the economy
- Objectives include ensuring that equitable resources are invested in renewable technologies; directing public resources for the implementation of renewable energy technologies; introducing suitable fiscal incentives for renewable energy and; creating an investment climate for the development of renewable energy sector

Biofuel Industrial Strategy (2007)
Addresses policy, regulations and incentives for biofuels.
Biofuels strategy aims to achieve a biofuels average market penetration of 4.5 per cent, of liquid road transport fuels (petrol and diesel) in South Africa by 2013, which is achievable without excessive support by utilising surplus agricultural capacity.
The fuel levy exemption on biofuel and support mechanism should continue and be adjusted, if necessary to assist the target being achieved.
Until this target is achieved, licensed biofuels producers will have a linked licence condition for petroleum wholesalers to accommodate qualifying production volumes at Basic Fuel Price (BFP) or import parity price.

LEGISLATION RELATED TO RENEWABLE ENERGY

Biofuel Mandatory Blending Regulation (2012)

- The regulation for mandatory blending

of bio-ethanol (2 – 10%) and biodiesel (>5%) came into effect in October 2015.

Whilst there is a comprehensive policy framework on RE, the country does not have a specific and comprehensive legislation on RE. However, in terms of the Electricity Regulation Act, 4 of 2006, the National Energy Regulator of South Africa (NERSA) is required to issue rules designed to implement the IPR.

[6] The first IPR for South Africa was developed in 2010.

ZAMBIA

LONG TERM DEVELOPMENT PLAN/S	**Vision 2030 (2006)** • References the achievement of universal access to clean, reliable and affordable energy at the lowest total economic, financial, social and environmental cost consistent with national development goals by 2030. • Revised Sixth National Development Plan 2013 – 2016 • sets out specific objectives relevant to the renewable energy sector, including: • To increase electricity generation capacity by at least 1,132MW and build appropriate transmission and distribution lines; • To increase rural electrification levels to 8%, and; • To expand the use of renewable and alternative energy in the country's energy mix.
ENERGY POLICY FRAMEWORK	**National Energy Policy (2008)** The policy focuses on: • Diversification of the country's energy mix through the use of renewable energy. • Create conditions that ensure availability of adequate supply of energy from various sources which are dependable at lowest economic, financial, social and environmental costs consistent with national development goals.
RENEWABLE ENERGY POLICY / PLAN/ STRATEGY	**Zambia Scaling-Up Renewable Energy Programme Investment Plan (SREP IP) (2018)** • It identifies barriers for increased private sector involvement in renewable energy power generation for small- and medium-sized Projects. • It aims to increase and diversify the national generation output through private sector participation using appropriate business models. • It mobilises resources from other partners to support capacity development of the various public and private players in project preparation, feasibility studies, project development and project management.
LEGISLATION RELATED TO RENEWABLE ENERGY	**Renewable Energy Feed in Tariff Strategy (2017)** • The Strategy will be implemented within the existing legal framework through the various Acts of Parliament which govern the resource management and development for the energy sector.

ZIMBABWE

LONG TERM DEVELOPMENT PLAN/S	**Vision 2030 (2018-2030)** Unclear RE targets
ENERGY POLICY FRAMEWORK	**National Energy Policy (2012)** • Seeks to promote R&D and the use of renewable sources of energy to support regional and international goals
RENEWABLE ENERGY POLICY / PLAN/ STRATEGY	**National Biofuel Policy (2020)** • It is a policy framework for the production and use of liquid biofuels in the transport sector. **National Renewable Energy Policy (2019) Aims at:** • Improving the share of RE in the overall energy mix and addressing issues of climate change. It targets 16.5% RE in total electricity generation by 20V25 and 25.5% RE in total electricity generation by 2030. • Obtaining cost-effective implementation of productive energy sources, social upliftment through community involvement, gender equality and employment generation. **Zimbabwe Climate Policy (2016)** • Seeks to create a pathway towards a climate-resilient and low carbon development economy in which the people have enough adaptive capacity and continue to develop in harmony with the environment.
LEGISLATION RELATED TO RENEWABLE ENERGY	There is no specific legislation yet to give effect to the National Renewable Energy Policy. What is in existence are the Renewable Energy Feed-In Tariffs (REFITs) for hydro, biomass, Solar PV and Wind.

It is clear that most of the SSA countries have developed policies and legislative frameworks to move towards sustainable energy mix by increasing the share of renewable energy in their energy mix (See Table 6.1). National development plans have integrated renewable energy development, whilst separate renewable energy policies, strategies and programmes have also been developed. However, the remaining challenges include:

1. Limited focus on the financial support for the policies, regulatory and institutional frameworks to effectively implement the initiatives since renewable energy investments entail high initial investment costs.

2. Lack of clear enforcement and monitoring mechanisms in the policy, legislative and institutional frameworks.

3. The risk of having fragmented policies and legal frameworks which do not speak to each other.

4. The absence of clear targets on "green" job creation, principles of decent work, green skills and just transition in the frameworks. Only South Africa included just transition in its IPR.

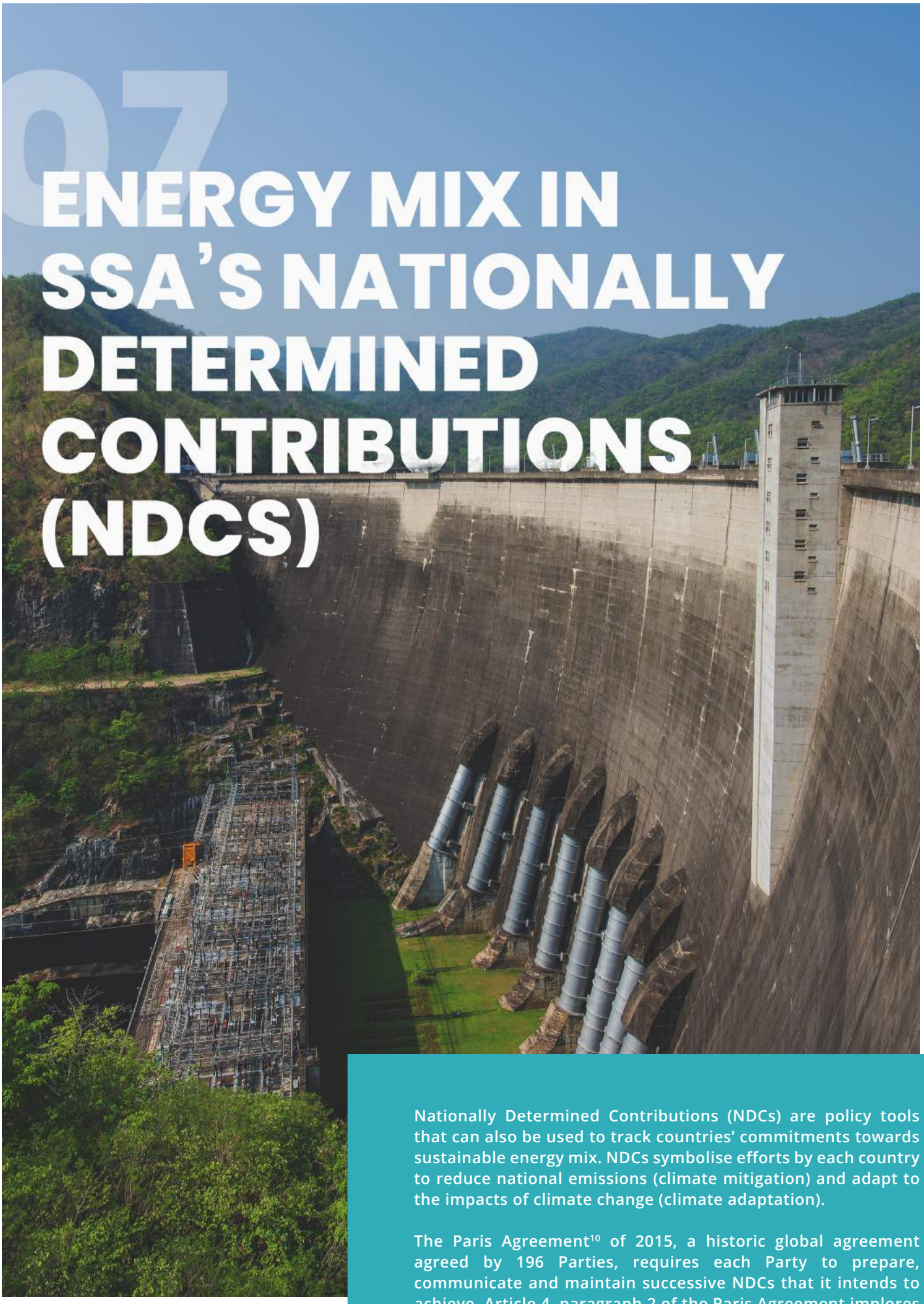
5. Reliance on donor funding in developing renewable energy initiatives and project implementation, which creates a dependency syndrome on SSA governments, thus undermining the sustainability of the initiatives in Table 6.1. Whilst donor support is welcomed as part of the developed countries' taking responsibility of the climate crisis; it is the over-reliance on donor support by developing countries in SSA creates challenges. For instance, in SSA most renewable energy initiatives have been driven by the World Bank, African Development Bank, Global Environmental Fund, Green Climate Fund, European Union, Japanese Development Agency, USAID, China, among others [7]. For specific country contexts Ghana initiatives have been supported by the UNDP [8] and in Zambia, the Africa Development Bank financing small scale renewable energy projects in Zambia [9].

6. Lack of transparency of the financial support (whether they are grants or loans) questions the debt-sustainability of the support. The global development thrust under the SDGs framework calls for governments to strengthen efforts to tap into domestic sources of funding.
7. Lack of inclusiveness of other stakeholders in the design, implementation, monitoring and evaluation of the renewable energy initiatives.

[7] *www.ictsd.org/bridges-news/bridges/africa/news/financing-renewable-energy-in-africa-in-the-sdg-ea*
[8] *www.gh.undp.org/content/Ghana/en/home/presscentre/pressreleases/2019/renewable_energy_masterplan.html*
[9] *www.itnewsafrica.com/2018/07/zambia/granted-50m-towards-renewable-energy-programme/*

07

ENERGY MIX IN SSA'S NATIONALLY DETERMINED CONTRIBUTIONS (NDCS)



Nationally Determined Contributions (NDCs) are policy tools that can also be used to track countries' commitments towards sustainable energy mix. NDCs symbolise efforts by each country to reduce national emissions (climate mitigation) and adapt to the impacts of climate change (climate adaptation).

The Paris Agreement[10] of 2015, a historic global agreement agreed by 196 Parties, requires each Party to prepare, communicate and maintain successive NDCs that it intends to achieve. Article 4, paragraph 2 of the Paris Agreement implores all Parties to pursue domestic mitigation measures, with the aim of achieving the objectives of such contributions.

Overall, NDCs loosely translated to "climate plans" are at the heart of the Paris Agreement. Implementation of the NDCs is expected to drive up the share of renewables and reduce the share of fossil fuels overall. Each climate plan reflects the country's ambition for reducing emissions, taking into account its domestic circumstances and capabilities. A global consensus and trend is to significantly reduce dependence on coal in the national energy mix by replacing it with renewable energy such as solar, hydro-energy, biogas, biomass and wind. However, an NDC will become binding when a country ratifies the Paris Agreement. Table 7.1 shows the state of ratification of the Paris Agreement and NDCs of SSA countries. Table 7.1 shows that the selected SSA's NDCs are legally binding since all ratified the Paris Agreement. This reveals the political commitments of SSA's governments at the global level towards implementing sustainable energy mix.

Table 7.1: *Selected SSA countries' commitment to the Paris Agreement and NDCs*

COUNTRY	PA SIGNED	PA RATIFIED	INDC SUBMITTED	1st NDC SUBMITTED
Botswana	22/4/2016	11/11/2016	1/10/2015	11/11/2016
Eswatini	22/4/2016	21/9/2016	29/9/2015	21/9/2016
Cote d'voire	22/4/2016	25/10/2016	20/9/2015	25/10/2016
DRC	22/4/2016	21/4/2017	29/9/2015	21/4/2017
Gabon	22/4/2016	2/11/2016	1/4/2015	2/11/2016
Ghana	22/4/2016	21/9/2016	23/9/2015	21/9/2016
Malawi	20/4/2016	29/6/2017	8/10/2015	29/6/2017
Nigeria	22/4/2016	16/5/2017	28/11/2015	16/5/2017
Tanzania	22/4/2016	18/5/2018	29/9/2015	18/5/2018
Senegal	22/4/2016	21/9/2016	25/9/2015	N/A
South Africa	22/4/2016	1/11/2016	25/9/2015	1/6/2016
Zambia	20/4/2016	9/12/2016	29/9/2015	9/12/2016
Zimbabwe	22/4/2016	7/8/2017	30/9/2015	7/8/2017

However, the Conference of Parties (COP) 24 of 2019, which was supposed to come up with the Paris Agreement rule book of putting into action the Paris Agreement, failed to come up with a consensus on the rule book. Thus, delayed finalisation of the Paris Agreement rule book may negatively affect the speed in the implementation of the NDCs.

Table 7.2 shows the various country commitments towards the reduction of fossil fuels, reduction in carbon emission and thus a gradual move towards a sustainable mix. An overall trend of NDCs is to significantly reduce dependence on fossils, especially coal and oil in the power mix by replacing it with renewables. The energy sector is consistently identified in the NDCs as a priority for emission reduction (climate mitigation) to meet the commitments on climate change. This will also facilitate modernised industrialisation in SSA countries driven by improved power generation capacity of renewable sources of energy. There are a few countries that do not provide emission reduction targets but have indicated their absolute intentions to reduce fossil energy and hence carbon emissions.

However, one of the main challenges in the implementation of the NDCs is the financial commitments and the technical support required by each country to finance the transition to renewable technologies and meet their emission reduction targets. Table 7.3 indicates that the financial requirements vary from country to country, ranging from US$18 billion for a small country such as Botswana to as high as above US$1 trillion for bigger countries such as South Africa.

[10] The Paris Agreement aims at limiting warming to 1.5 to 2 degrees C above pre-industrial levels

However, one of the main challenges in the implementation of the NDCs is the financial commitments and the technical support required by each country to finance the transition to renewable technologies and meet their emission reduction targets. Table 7.3 indicates that the financial requirements vary from country to country, ranging from US$18 billion for a small country such as Botswana to as high as above US$1 trillion for bigger countries such as South Africa.

The technological deficits may also deter progress towards achievements. Already countries indicate a vast number of technological capacity investment. No wonder developing countries are calling on developed countries to commit financial resources to assist developing countries in the transition especially given that developing countries are the least contributors to carbon emissions which are causing global warming and thus climate change. Technological requirements in NDCs include:

1. Biomass-to-energy technology,
2. Waste-to-energy technology, and,
3. Development of partnerships between companies and research centres on the development of low-carbon solutions, among others.

Table 7.2: *SSA selected countries NDCs mitigation targets, implementation periods and national pledges*

COUNTRY	MITIGATION SUMMARY				IMPLEMENTATION PERIOD		CLIMATE MITIGATION NATIONAL PLEDGE
	MITIGATION TARGET	BASELINE YEAR	TARGET YEAR	BUDGET TYPE	START YEAR	END YEAR	
Botswana	15%	2010	2030	N/A	N/A	N/A	The country intends to achieve an overall emissions reduction of 15% by 2030, taking 2010 as the base year.
Eswatini	100% increase of renewable energy share	2010	2030	N/A	2020	2030	Eswatini's contribution is to double the share of renewable energy in the national energy mix by 2030, relative to 2010 levels.
Cote d'voire	28%	2012	2030	N/A	N/A	2030	Reduction of 28% in GHG emissions compared to emissions in the target year (2030) in a baseline scenario (BAU or Business As Usual).
DRC	17%	2000	2030	N/A	2021	2030	The DRC commits to reduce its emissions by 17% by 2030 compared to business-as-usual emissions (430 Mt CO2e), or a reduction of slightly more than 70 Mt CO2e avoided (Ministry of the Environment, 2009)
Gabon	At least 50%	2000	2025	N/A	2020	2025	Gabon commits to reduce GHG emissions by at least 50 percent from baseline scenario emissions in 2025.
Ghana	15% unconditional, 45% conditional	BAU	2030	N/A	2020	2030	Ghana's emission reduction goal is to unconditionally lower its GHG emissions by 15 percent relative to a business-as-usual (BAU) scenario emission of 73.95MtCO2e by 2030. An additional 30 percent emission reduction is attainable on condition that external support is made available to Ghana to cover the full cost of implementing the mitigation action. With this external support, a total emission reduction of 45% below the BAU emission levels can be achieved by 2030.
Malawi	N/A	N/A	2030	N/A	2015	2040	Estimates suggest that between 14,000 and 16,000 Gg of CO2 equivalent will be saved per year by 2030 if a robust low emission development path is adopted.
Nigeria	20% unconditional and 45% conditional	BAU	2030	N/A	2015 v	2030	In the event an ambitious, comprehensive legally binding global agreement is reached at COP21 in Paris, Nigeria will make an unconditional contribution of 20 per cent below BAU that is consistent with the current development trends and government policy priorities. Nigeria can make a significant additional contribution with international support, in the form of finance and investment, technology and capacity building. The combined policies and measures can deliver in a cost-effective manner direct development benefits to the country and reduce emissions 45 per cent below BAU.

COUNTRY	MITIGATION SUMMARY				IMPLEMENTATION PERIOD		CLIMATE MITIGATION NATIONAL PLEDGE
	MITIGATION TARGET	BASELINE YEAR	TARGET YEAR	BUDGET TYPE	START YEAR	END YEAR	
Tanzania (United Republic of)	10-20%	BAU	2030	N/A	N/A	N/A	Tanzania will reduce greenhouse gas emissions economy-wide between 10-20% by 2030 relative to the BAU scenario of 138 - 153 Million tons of carbon dioxide equivalent (MtCO2e)- gross emissions, depending on the baseline efficiency improvements, consistent with its sustainable development agenda. The emissions reduction is subject to review after the first Biennial Update Report (BUR).
Senegal	5% unconditional and 21%	BAU	2030	N/A	N/A	N/A	Under the unconditional scenario (INDC) emission reductions relative to baseline projections will be 3%, 4% and 5% in 2020, 2025 and 2030 respectively. Under the conditional scenario (INDC+), expected emission reductions would be 7%, 15% and 21% for the same years.
South Africa	Emissions peak between 398 and 614 Mt CO2–E	N/A	2025 and 2030	N/A	2021	2030	South Africa's emissions by 2025 and 2030, will be in a range between 398 and 614 Mt CO2–eq, as defined in national policy.
Zambia	25% unconditional, 47% conditional	2010	2030	N/A	N/A	2030	The successful implementation of Zambia's INDC will result in an estimated total emission reduction of 38,000 GgCO2eq which translates to 47% (internationally supported efforts) against 2010 as a base year. This emission reduction is conditional and subject to the availability of international support in the form of finance, technology and capacity building.
Zimbabwe	33% carbon intensity reduction	BAU	2030	N/A	2020	2030	The Mitigation Contribution for Zimbabwe is given as 33% below the projected Business as Usual energy emissions per capita by 2030.

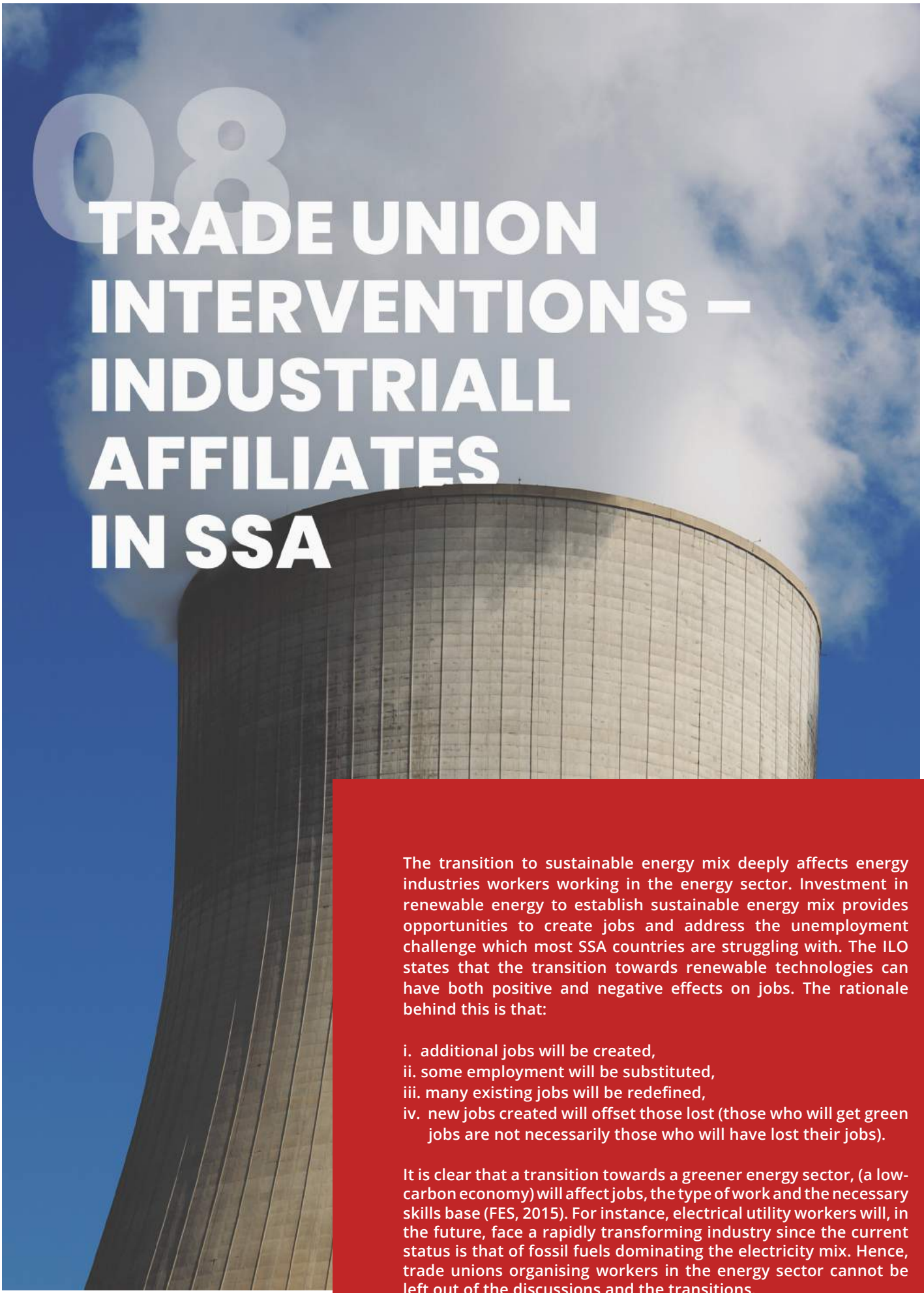
Source: *UNFCCC, 2019*

Table 7.3: SSA country's financial budgets pledges under NDCs

COUNTRY	FINANCIAL PLEDGES (US$BN)			QUANTIFIED FINANCIAL NEEDS	TECHNOLOGY NEEDS
	MITIGATION	ADAPTATION	TOTAL		
Botswana	18.4	N/A	18.4	It is estimated that to achieve the set target of 15% GHG emission reduction by 2030, the country would require approximately USD18.4 billion. These funds will be allocated to energy and transport sector infrastructural developments which will contribute to emission reductions.	Innovative technologies in the use of land, Biomass-to-energy technology, Waste-to-energy technology
Eswatini	N/A	N/A	N/A	N/A	N/A
Cote d'voire	N/A	N/A	N/A	N/A	[Translated] Development of partnerships between companies and research centres on the development of low-carbon solutions. Better access to tools (e.g. setting of cropping cycles in the rainy season)
DRC	12.5	9.1	21.6	[Translated] The financial needs of the Democratic Republic of the Congo are: 21.622 billion USD (Adaptation: 9.082 billion USD; Mitigation: 12.540 billion USD)	The needs mainly concern the agriculture sector, the energy and transport sector with access to the strengthening of the drinking water supply, sanitation and waste management, the strengthening of the conservation measures of biodiversity and population integration in the forest sector and the integrated protection of coastal areas.
Gabon	N/A	N/A	N/A	N/A	N/A
Ghana	N/A	N/A	22.6	In the 10-year period, Ghana needs USD 22.6 billion in investments from domestic and international public and private sources to finance these actions. USD 6.3 billion is expected to be mobilized from domestic sources, whereas the USD 16.3 billion will come from international support.	N/A
Malawi	N/A	N/A	N/A	N/A	Biodiesel, ethanol production, energy-saving stoves, soil-cement stabilized block, and rice husk ash blended cement, alternative building materials and technologies, carbon capture and storage, climate-resilient agronomic practices, a controlled landfill for biogas recovery, waste to energy incinerators, multipurpose dams for irrigation and aquaculture, e-climate information and early warning systems, storage dams for hydropower generation, infrastructure for flood control, transport, etc.

COUNTRY	FINANCIAL PLEDGES (US$BN)			QUANTIFIED FINANCIAL NEEDS	TECHNOLOGY NEEDS
	MITIGATION	ADAPTATION	TOTAL		
Nigeria	N/A	N/A	142.0	Cost estimate data: National Cost = $142b; National Benefits = $304b (World Bank report "Low Carbon Development Opportunities for Nigeria" (2013))	N/A
Tanzania (United Republic of)	60.0	15.0	75.0	The total amount of financial resources needed for implementation of the identified adaptation contributions is about USD 500 million to 1billion per annum, and a total of USD 60 billion for mitigation contributions.	Promoting the use of energy-efficient technologies, promoting wastewater reuse and recycling technologies, Promotion of clean technologies for power generation, Promoting energy-efficient technologies for supply, and transmission and transportation.
Senegal	5.0	14.6	19.6	Adaptation: 14,558 million USD by 2035; Mitigation: 1.8 billion USD for the unconditional target and 5 billion USD for the conditional target.	Strengthen technical capabilities in cartography and geographic information systems, and use of GPS; Natural gas combined cycle plants; CSP (TES + Desalination + GN); Wind turbine with permanent magnet and direct drive, and; Natural Gas Logistics and infrastructure requirements; Co / tri-generation system, and; Monitoring, measurement and monitoring system.
South Africa	1395.0	50.0	1,445.0	Costs of mitigation actions: 1.expand REI4P in the next ten years: US$3 billion per year; 2. Decarbonised electricity by 2050 - US$349 billion from 2010; 3. CCS: 23 Mt CO2 from the coal-to-liquid plant - US$0.45 billion; 4. Electric vehicles - US$513 billion from 2010 till 2050, and; 5. Hybrid electric vehicles: 20% by 2030 - US$488 billion.	Energy efficient lighting; variable speed drives and efficient motors; energy efficient appliances; solar water heaters; electric and hybrid electric vehicles; solar PV; wind power; carbon capture and sequestration; and advanced bio-energy.
Zambia	N/A	N/A	50.0	The total budget for implementing both components is estimated at US$50 billion by the year 2030, out of this USD 35 billion is expected to come from external sources while $15 billion will be mobilized from domestic sources.	Renewable Energy Technologies and Early Warning Systems, Water technologies for savings, recycling, irrigation and sustainable management for household, agriculture and industrial purposes.
Zimbabwe	55.8	1.5	57.3	Mitigation: 55,796 million USD; Adaptation (for energy sector): US$1.5 billion of which US$300 million is own contribution.	N/A

Source: UNFCCC, 2019



08 TRADE UNION INTERVENTIONS – INDUSTRIALL AFFILIATES IN SSA

The transition to sustainable energy mix deeply affects energy industries workers working in the energy sector. Investment in renewable energy to establish sustainable energy mix provides opportunities to create jobs and address the unemployment challenge which most SSA countries are struggling with. The ILO states that the transition towards renewable technologies can have both positive and negative effects on jobs. The rationale behind this is that:

i. additional jobs will be created,
ii. some employment will be substituted,
iii. many existing jobs will be redefined,
iv. new jobs created will offset those lost (those who will get green jobs are not necessarily those who will have lost their jobs).

It is clear that a transition towards a greener energy sector, (a low-carbon economy) will affect jobs, the type of work and the necessary skills base (FES, 2015). For instance, electrical utility workers will, in the future, face a rapidly transforming industry since the current status is that of fossil fuels dominating the electricity mix. Hence, trade unions organising workers in the energy sector cannot be left out of the discussions and the transitions.

8.1 INDUSTRIALL AFFILIATES ACTIONS AT COUNTRY LEVEL

Table 8.4 indicates the questionnaire analysis form the various affiliates of IndustriALL. It assesses the knowledge and familiarity with national discourse and policies, as well as the level of integration of renewable energy programmes in the affiliates' programmes. The major limitation was the low response rate from the affiliates. Out of the 19 questionnaires that were distributed to all affiliates of IndustriALL in SSA, nine were responded to (47 percent response rate). From the questionnaire responses, there were knowledge gaps among the affiliates as well as capacity deficits in the areas of research and analysis, education and conscientisation and advocacy and engagement.

Table 8.1: *IndustriALL affiliates internal and external capacity assessment*

TRADE UNION INTERNAL ASSESSMENT

	TRADE UNION WORK ON CLIMATE CHANGE (POLICY DEVELOPMENT, RESEARCH, EDUCATION AND TRAINING OR ADVOCACY AND ENGAGEMENT)
Ghana ICU	No
Ghana GTPCWU	No
Malawi ESU	No
Eswatini SESM-AWU	No
Zimbabwe ZEWU	Yes
Tanzania TUICO	No
Senegal SYNTICS	Yes, Research, advocacy & engagement
DRC TUMEC	Yes
Cote D'Ivoire SYNTEPCI-CIV	No

	TRADE UNION'S POLICY AND/OR STRATEGIC PLAN FOCUSING ON ALTERNATIVE ENERGY / RENEWABLE ENERGY, E.G. SOLAR, WIND, BIO-ENERGY, MICRO-HYDRO ETC.
Ghana ICU	No
Ghana GTPCWU	No
Malawi ESU	No
Eswatini SESM-AWU	No
Zimbabwe ZEWU	No
Tanzania TUICO	No
Senegal SYNTICS	No
DRC TUMEC	No
Cote D'Ivoire SYNTEPCI-CIV	No

	TRADE UNION ACTIVITIES (RESEARCH, EDUCATION AND TRAINING OR ADVOCACY AND ENGAGEMENT) RELATED TO CLIMATE CHANGE AND RENEWABLE ENERGY OR ENERGY MIX
Ghana ICU	No
Ghana GTPCWU	Yes, education & advocacy
Malawi ESU	No
Eswatini SESM-AWU	No
Zimbabwe ZEWU	No
Tanzania TUICO	No
Senegal SYNTICS	Yes, Research, advocacy & engagement
DRC TUMEC	No
Cote D'Ivoire SYNTEPCI-CIV	No

	KNOWLEDGE OF THE EXISTENCE OF ANY POLICY ON CLIMATE CHANGE AND ALTERNATIVE ENERGY OR ENERGY MIX AT THE NATIONAL FEDERATION LEVEL
Ghana ICU	No
Ghana GTPCWU	No
Malawi ESU	No
Eswatini SESM-AWU	No
Zimbabwe ZEWU	No
Tanzania TUICO	No
Senegal SYNTICS	No
DRC TUMEC	No
Cote D'Ivoire SYNTEPCI-CIV	No

	CAPACITY DEVELOPMENT REQUIRED
Ghana ICU	Yes
Ghana GTPCWU	Yes
Malawi ESU	Yes
Eswatini SESM-AWU	Yes
Zimbabwe ZEWU	Yes
Tanzania TUICO	Yes
Senegal SYNTICS	Yes
DRC TUMEC	Yes
Cote D'Ivoire SYNTEPCI-CIV	Yes

TRADE UNION EXTERNAL ASSESSMENT

	KNOWLEDGE OF GOVERNMENT'S POLICY OR STRATEGIC POSITION ON CLIMATE CHANGE AND RENEWABLE ENERGY
Ghana ICU	Yes
Ghana GTPCWU	Yes
Malawi ESU	No
Eswatini SESM-AWU	Limited
Zimbabwe ZEWU	Limited
Tanzania TUICO	No
Senegal SYNTICS	Yes
DRC TUMEC	No
Cote D'Ivoire SYNTEPCI-CIV	No

	INVOLVEMENT IN THE NATIONAL PROCESSES AND DISCUSSIONS TO DEVELOP THE CLIMATE CHANGE AND RENEWABLE ENERGY POLICIES
Ghana ICU	Yes, tripartite Level
Ghana GTPCWU	Yes
Malawi ESU	No
Eswatini SESM-AWU	No
Zimbabwe ZEWU	No
Tanzania TUICO	No
Senegal SYNTICS	No
DRC TUMEC	No
Cote D'Ivoire SYNTEPCI-CIV	No

	KNOWLEDGE OF NATIONAL LEGISLATIVE REFORMS TO PROMOTE RENEWABLE ENERGY IN YOUR COUNTRY
Ghana ICU	Yes
Ghana GTPCWU	Partly
Malawi ESU	No
Eswatini SESM-AWU	No
Zimbabwe ZEWU	Limited
Tanzania TUICO	No
Senegal SYNTICS	Yes, environmental code
DRC TUMEC	No
Cote D'Ivoire SYNTEPCI-CIV	No

Note: Tables will be updated as more questionnaires are received

The analysis of the questionnaire responses indicated that none of the affiliates had:

A. A trade union policy and/ or strategic plan focusing on alternative energy/renewable energy,

B. Trade union activities (research, education and training or advocacy and engagement) related to climate change and renewable energy or energy mix,

C. Knowledge of the existence of any policy on climate change and alternative energy or energy mix at national federation level,and,

D. Trade union strategic plan speaking to issues of climate change and renewable energy.

CAPACITY DEVELOPMENT NEEDS

i. Education and sensitisation on climate change, green jobs, renewable energy and how these interact with decent work concepts, opportunities and challenges for labour,

ii. Exchange programmes on the sustainable energy mix

Only one affiliate, ZEWU, had undertaken work on climate change and renewable energy in the following ways:

i. Lobbied for the expansion of Kariba hydro-power station,

ii. Participated in a clean energy workshop hosted by the Ministry of Women Affairs where we were advised of possible energy; generation projects which can be held throughout the country,

iii. Pushed for the implementation of the Gwanda solar project, and,

iv. Participated in a national solar power annual summit.

09 CONCLUSIONS

The global energy demand is on the increase rising from 253 Mtoe in 2017 to 328 Mtoe in 2018, giving a 2.3 percent increase. Similarly, Africa's energy demand increased by 2.9 percent from 449 Mtoe in 2017 to 462 Mtoe in 2018. Whereas the global energy landscape is moving towards renewable energy, against the backdrop of climate change and the need to reduce emissions from fossil fuels, countries in the Sub-Sahara African (SSA) region are faced with a dilemma of policy choice.

The dilemma arises from the fact that on the one hand, SSA has abundant fossil sources, with discoveries of fossil sources in the past decade, whilst on the other hand, there is a global call for an energy transition from fossils to renewable energy as stipulated in the Paris Agreement of 2015 and SDG 7.

For instance, according to the Africa Energy Outlook of 2014, 30 percent of global oil and gas discoveries made between 2010 and 2014 have been in the SSA region. At the same time, SSA has abundant potential for developing renewable energy such as wind, biomass, solar and hydropower, which, however, remain largely untapped. Hence, with this scenario, coupled with the high cost of investment on renewable energy versus fossil fuels, SSA countries' pace of adopting renewable energy has remained low.

At the time of the research, hydropower had a substantial share in the SSA energy mix. However, in the context of climate change and erratic and unpredictable rainfall patterns, especially in the SADC region, the sustainability of hydropower becomes questionable. As such, in recent statistics, there has been a focus on 'new renewables' (wind, solar, ocean; modern biomass and geothermal).

With this scenario, there is need for robust dialogues, concerted effort and a paradigm shift by policymakers and all stakeholders, including trade unions, in the SSA region to move towards a sustainable energy mix and energy security. This is against the background that a sustainable energy mix has the opportunity to foster sustainable economic growth, ensuring efficient and sufficient energy supply for Africa's industrialisation, and creating new employment opportunities.

A sustainable energy mix is critical in meeting the needs of SSA citizens. Whilst coal represents the main energy and electricity source, given its comparative costs with renewable energy; inadequate electricity generation remains a huge challenge in SSA. In this context, renewable energy plays an important role in meeting the needs of the SSA region in terms of sustainable development.

An overview of the energy policy, legislative and institutional framework in the four sub-regions in SSA shows that EAC, ECOWAS and SADC sub-regions are more advanced compared to ECCAS. However, the plethora of policy and legal frameworks and instruments at sub-regional and national levels at times may create the risk of policy incoherence which may limit the effectiveness of the policy and adaptation and implementation.

On the other hand, policies should also focus on improving political will to implement the ratified Protocols, for instance, the Paris Agreement and the NDCs through robust legislative reforms.

Whilst there is an abundance of renewable energy sources in SSA countries, as well as clear policy, legislative and institutional frameworks at country and sub-regional levels, there has been a slow pace of in adoption of renewable energy in the energy mix of most of the SSA countries.

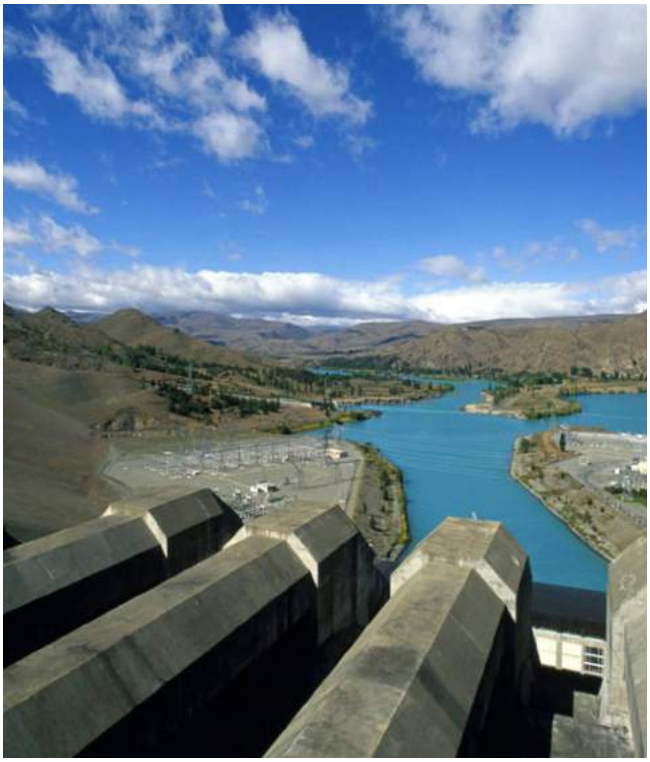
For the trade unions and workers, the transition towards a sustainable energy mix has both positive and negative impacts or disruptions in the labour market, which occurs in 5 ways:

i. additional jobs will be created,

ii. some employment will be substituted,

iii. many existing jobs will be redefined,

iv. new jobs created will offset those lost (those who will get green jobs are not necessarily those who will have lost their jobs).



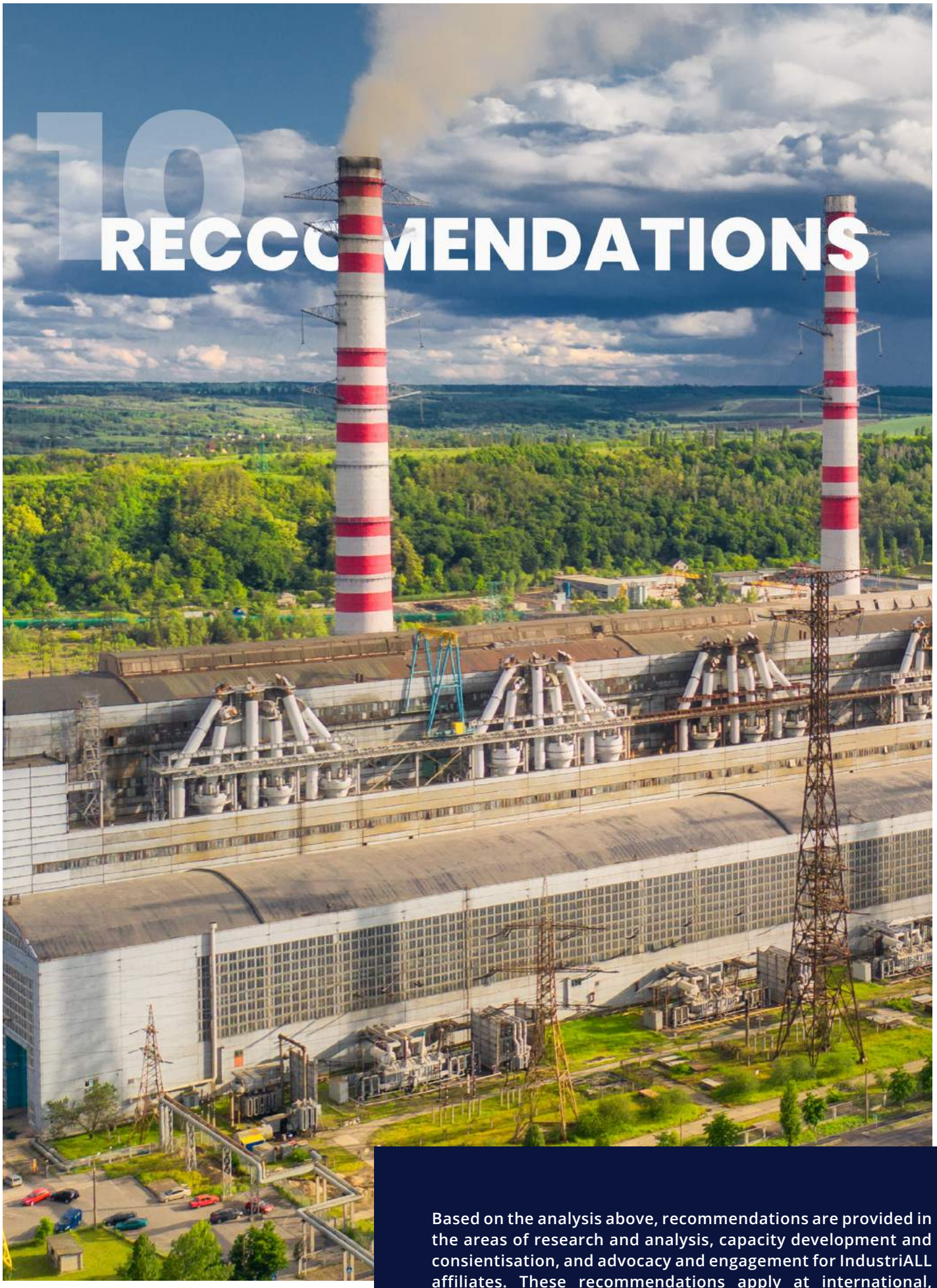
On the trade union level (IndustriALL affiliates in SSA), the discourse of climate change, renewable energy and the sustainable energy mix is still in its infancy. They also lag in their participation and engagement with the sustainable energy mix discourse at national sub-regional, continental and international levels.

Knowledge and familiarity with national discourse and policies on sustainable energy mix and renewable energy are limited. Similarly, integration of climate change, renewable energy, green jobs and programmes in the affiliate programmes, policies and other initiatives is very low and requires serious attention.

From the questionnaire responses, there were knowledge gaps among the affiliates as well as capacity deficits in the areas of research and analysis, education and conscientisation and advocacy and engagement.

Another area critical for trade unions is that the transition towards sustainable energy brings disruption in the labour market through job losses in fossil fuel companies (coal, oil and gas), and emergence of precarious jobs with decent work deficits in the "new" renewable energy sectors.

A reason why some trade unions may not feel comfortable engaging in the discourse on transitioning towards a sustainable energy mix. All this requires trade union preparedness to be able to deal with these challenges.



10 RECOMMENDATIONS

Based on the analysis above, recommendations are provided in the areas of research and analysis, capacity development and consientisation, and advocacy and engagement for IndustriALL affiliates. These recommendations apply at international, regional, national and sectoral level.

A. ROLE OF THE AFFILIATE UNIONS

10.1 RESEARCH AND ANALYSIS

In order to undertake policy-oriented advocacy and engagement from an informed position, the affiliate unions need to undertake evidence-based research and analysis on the following:

i. In-country and regional sustainable energy mix and its implications for workers focusing on the quantity and quality of jobs.

ii. In-country green initiatives as well as documenting, generating, recording and analysing data on green jobs.

iii. International acceptable practices on transitioning towards sustainable energy mix and worker-participation success stories.

10.2 CAPACITY DEVELOPMENT AND CONSCIENTISATION

Clearly, a transition to a sustainable energy mix will create demand for skilled workers as well as knowledgeable and informed trade unions and membership able to meaningfully engage policymakers and other stakeholders to advance their rights and interest.

As such, the following is required for trade unions and their membership in order to promote trade union- and worker-activism and collective action around transition to sustainable energy mixes for countries in the SSA region:

i. Developing an education and training manual on climate change, renewable energy, green jobs, green skills and sustainable energy mix so as to develop knowledge capacities of the trade unions and their membership so that they develop appropriate actions, responses and interventions in energy transition discourse. This will further assist workers in integrating Sustainable Development Goals (SDG) especially SDG 7 on modern energy and SDG 13 on climate action into trade union work,

ii. Undertake training workshops based on the education and training manual indicated above so as to impart knowledge and skills on climate change and its interaction with sustainable energy mix, effects, and the related challenges and opportunities for trade unions,

iii. Develop popular education material to raise awareness among workers. The subject of the sustainable energy mix, climate change and green economy is still embodied in the technical language which needs to be broken down to simpler versions that trade unions and their membership can relate to for them to take the required action, responses and interventions. This material can further be translated into the local language for a wider understanding of the issues;

iv. Skills training for trade union negotiators so that they can integrate climate change, renewable energy and mix issues in collective bargaining at an enterprise, sectoral and national level such as retraining and reskilling of workers in green technologies as well as stimulating pro-worker investments,

v. Trade unions collaboration and creation of partnerships with educational and training institutions to provide short courses on green skills in the energy sector for their members as part of a benefit for being trade union members. This can also act as a recruitment and organising strategy for the trade unions,

vi. Developing internal trade union policies on climate change, renewable energy and energy mix to guide trade union actions and programmes, and,

vii. Effective participation at sectoral, national, regional and international forums where climate change and renewable energy discussions take place. For instance, for SSA affiliates to participate at Conference of Parties (COPs) which are international climate change annual forums.

10.3
HARNESSING AND LEVERAGING TECHNOLOGY

Given the increasingly shrinking space for trade unions in some of the SSA countries, trade unions need to take advantage of opportunities arising from advanced ICTs and social media platforms. Trade unions can undertake online campaigns on SDGs, green jobs and sustainable energy mix and renewable energy policies in order to reach out to a broader audience and enhance trade union visibility.

Online campaigns and courses have the advantage of reaching a wider audience so as to promote worker-activism around transition to sustainable energy. They can also develop and administer short online courses for membership on key topics such as SDGs, NDCs, renewable energy technologies, climate change and green jobs so to develop knowledge capacities of their members.

10.4
ADVOCACY AND ENGAGEMENT

10.4.1 NATIONAL LEVEL

Policy demands for trade unions should include the following:

i. National budgetary support for the development of national renewable energy-related policies such as NDCs and SDGs, especially SDG 7,

ii. National budgetary support for implementing national renewable energy-related projects across the countries,

iii. Government's political will to domesticate ratified Paris Agreement and SDGs in line with national development priorities on renewable energy,

iv. Implementation of pro-worker and decent-work friendly climate and energy mix policies,

v. Educational and skills development institutions focusing on harnessing the full local employment potential of renewable energy investments,

vi. Integration of just transition principles, strategies and plans in RE policies and legislation towards a sustainable energy mix. For example, reskilling of workers by the Government and the employers; and, utilisation of social dialogue structures at national, sectoral, workplace and community level during the renewable energy transition, among others,

vii. The integration of employment targets or jobs targets in any national renewable energy initiatives or projects,

viii. Inclusion of trade unions in national renewable energy projects from the planning and design stage to implementation, monitoring and evaluation of the projects,

ix. Gender-sensitive renewable energy policies, strategies and programmes at both regional and national level as in the case of SADC,

x. Increased education and training systems such through investing in STEM (Science, Technology, Engineering and Maths) subjects, developing renewable energy curricula for all levels, integrating green skills modules into vocational training courses, supporting green apprenticeships, and establish common quality standards of green products,

xi. Ensure partnerships, private development financing, trade and investment agreements that come in the name of sustainable energy, do not ignore/neglect fundamental human and workers' rights, and in particular, women worker's rights and girl child rights,

xii. Inclusion of trade unions in sub-regional structures. Some of these structures cascade to the national level. For instance, the EAC mandated national governments to establish national multi-stakeholder committees at the country level that feeds into the EAC structure. This can be replicated in other sub-regions of SSA. This arrangement creates an opportunity for trade unions to voice their concerns and contribute to national and sub-regional processes of establishing a sustainable energy mix. Thus, ensuring that jobs, rights and interest of workers are embedded in national policy,

xiii. Transparency and accountability of financial resources provided to relevant ministries that deal with renewable energy projects, and,

xiv. Trade unions should demand active participation in climate change-related policy formulation, monitoring and evaluation.

10.4.2 SECTORAL AND WORKPLACE LEVEL

Trade unions should engage employers to establish a social plan or social fund, so as to assist workers who may be negatively affected by the transition to renewable energy and sustainable energy mix. Areas of intervention may include comprehensive social security and retraining or reskilling of workers. An inclusive due diligence process is required to establish the affected workers and their families and the extent of the impact (a social impact assessment of the energy transition).

10.5 NETWORKING, PARTNERSHIPS AND STRATEGIC ALLIANCES

As part of their policy advocacy and engagement strategy, trade unions should identify like-minded non-state actors at the national, regional and continental level (communities based organisation, non-governmental organisations, civil society organisations, residence associations and climate justice groups, informal economy associations, among others) to work with.

Such initiatives enable the building of synergies, amplifying of voices, and extension of technical and operational resources towards a common goal or agenda such as mobilising for political commitment.

Additionally, various platforms exist for IndustriALL affiliates to create strategic alliances and partnerships with like-minded organisations to advance the "worker-friendly"-energy transition agenda. Such platforms include, for example, participation at COPs, United Nations Regional Forum on Sustainable Development (ARFSD) and the High-Level Political Forum (HLPF) on SDGs.

B. ROLE OF INDUSTRIALL GLOBAL UNION

IndustriALL should continue to:

i. Strengthen south-south and north-south engagements and exchange programmes among IndustriALL affiliates so that they can share knowledge, skills and successful initiatives in specific areas on trade union engagement in social dialogue (national or beyond) on transitions to the sustainable energy mix, climate change and renewable energy. This will also assist the trade unions in solving specific and common challenges they face in the transition and move away from being reactionary to being proactive. Furthermore, these engagements and exchange programmes should go beyond trade union policymakers level (e.g. General Secretaries and Presidents) but, must also be cascaded to shop stewards level,

ii. Facilitate online national or inter-continental training programmes on the role of trade unions in national, regional and international dialogues on climate change, renewable energy and sustainable transition towards sustainable energy. This will provide a platform to strengthen solidarity action, share and learn from each other and provide solutions to challenges they meet in the transition towards sustainable energy,

iii. Provide support to its affiliates to integrate just transition measures in support of workers' skills and conditions in global framework agreements (GFAs) in line with the ILO Guidelines for a just transition for workers,

iv. Support organising and recruitment programmes are given that renewable energy development is creating emerging (new) sectors within the energy and other relevant sectors. This may require trade unions to reorganise themselves and collaborate to recruit new members in the "new" sectors,

v. Capacitate affiliates to engage with national policy actors in order to address policy gaps;

vi. Support trade unions in developing research capacity to begin to do job surveys and profiles on job creation in the renewable energy sector. Attention also needs to be given to disaggregated data based on gender in order to ensure that there is equality of opportunity for women and men for green jobs;,and,

vii. Facilitate peer learning programmes among SSA affiliates on how they effectively remain relevant in the discourse on energy transition by linking with other like-minded networks across the world.

Annex 1: *IndustriALL affiliates*

COUNTRY	IndustriALL affiliate	Response rate (Yes/No)
Botswana	Botswana Power Corporation Union (BPCU)	No
Eswatini	Swaziland Electricity Supply Maintenance and Allied Workers Union (SESM-AWU)	Yes
Cote de Ivoire	Syndicat national des travailleurs des entreprises pétrolières de Côte d'Ivoire (SYNTEPCI-CIV)	Yes
DRC	Travailleurs Unis des Mines, Métallurgies,Energie, Chimie et Industries Connexes (TUMEC)	No
Gabon	Organisation Nationale des Employés du Pétrole (ONEP)	No
Ghana	Industrial and Commercial Union (ICU)	Yes
	General Transport, Petroleum and Chemical Workers' Union (GTPCWU)	No
	Public Utility Workers' Union (PUWU)	Yes
Malawi	Electricity Supply Corporation of Malawi Staff Union (ESU)	Yes
Nigeria	National Union of Electricity Employees of Nigeria (NUEE)	No
	Nigeria Union of Petroleum and Natural Gas Workers (NUPENG)	No
Tanzania	Tanzania Union of Industrial and Commercial Workers (TUICO)	No
Senegal	Syndicat National Des Travailleurs des Industries Chimiques Et Activities Rattachees Du Senegal (SYNTICS)	No
South Africa	National Union of Mineworkers (NUM)	Yes
	National Union of Metal Workers of South Africa (NUMSA)	No
Zambia	National Energy Sector and allied Union of Zambia (NESAWU)	
Zimbabwe	Zimbabwe Energy Workers Union (ZEWU)	Yes
Zimbabwe	SSAEN Women focal point (Zimbabwe Energy Workers Union (ZEWU)-	Yes
Ghana	SSAEN Youth focal point (General Transport, Petroleum and Chemical Workers' Union (GTPCWU)	Yes

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