



Economic Commission for Africa
Committee on Regional Cooperation and Integration
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Report on infrastructure development in Africa 2015
Priority areas and interventions

I. Introduction

1. Infrastructure development and maintenance are core components of regional development initiatives in Africa, the most recent of which are New Partnership for Africa's Development (NEPAD) and Agenda 2063. The Programme for Infrastructure Development in Africa (PIDA) provides a long-term vision for Africa's infrastructure development and a platform for African countries, both individually and collectively, to engage with investors and development partners. The Presidential Infrastructure Champion Initiative (PICI), which consists of eight projects championed by the African Heads of State and Government and drawn mostly from PIDA projects, provides further impetus to the implementation of regional infrastructure projects in Africa. PIDA, in turn, draws largely from the infrastructure master plans of regional economic communities. In addition to PIDA and PICI projects, several regional corridors link Africa's landlocked countries to the sea. The most prominent of these regional programmes is the Trans-African Highways (TAH) network (see table 1).

Table 1

Connection of landlocked countries to regional infrastructure corridors

Country	TAH	PIDA	PICI	Other corridors*	Ports used
Botswana	X	X	X	X	Durban, Walvis Bay
Burkina Faso	X	X	X	X	Tema, Lome, Cotonou
Burundi	X	X	X		Mombasa, Dar es Salaam, Lamu
the Central African Republic	X	X	X		Douala, Point Noire
Chad	X	X	X		Douala, Point Noire
Ethiopia	X	X	X	X	Djibouti, Lamu, Assab, Massawa
Lesotho	X	X			South African ports
Malawi	X	X	X	X	Durban, Beira, Dar es Salaam, Nakala
Mali	X	X	X	X	Abidjan, Dakar, Tema, Lome
the Niger	X	X	X	X	Dakar, Cotonou, Lagos, Tema, Lome
Rwanda	X	X	X		Mombasa, Dar es Salaam, Lamu
South Sudan		X	X	X	Lamu
Swaziland		X			South African ports
Uganda	X	X	X		Mombasa, Dar es Salaam, Lamu
Zambia	X	X	X	X	Durban, Dar es Salaam, Beira, Walvis Bay
Zimbabwe	X	X	X	X	Durban, Beira, Nakala, Walvis Bay

* Corridors that are not part of TAH, PIDA or PICI.

Note: TAH, PIDA and other corridors refer only to the transport sector while PICI includes transport projects, information and communications technology and gas pipelines.

2. In essence, Africa has a well-defined framework for regional infrastructure development that seeks, among other things, to ensure that landlocked countries on the continent have reliable and cost-effective access to the sea.

3. The present report summarizes the interventions of the Economic Commission for Africa (ECA) in the area of infrastructure, paying particular attention to the transport and energy infrastructure. This result-based report is presented to show: the current status of the transport and energy infrastructures, particularly focussing on the gaps; the key priority areas that are being focused on to optimize these infrastructure types; the results that ECA is achieving, although some results are work in progress; and the recommendations on new focus areas moving forward. It concludes by discussing the critical component of infrastructure development in Africa: investment, to show the current state of play and progress in bridging the requisite infrastructure finance gap.

II. Contribution to regional infrastructure development

4. ECA contributes to TAH, PIDA, PICI and the United Nations Sustainable Energy for All (SE4ALL), and other cross-border infrastructure programmes through policy research to improve understanding of the challenges to their implementation, dissemination of the knowledge generated, capacity-building of government officials and advocacy for global support to Africa's infrastructure development. This advocacy is undertaken at platforms such as the Regional Coordination Mechanism for the United Nations system support to the African Union and its NEPAD Programme.

A. Resource mobilization

5. The President of Senegal, and the Chairperson of NEPAD, Macky Sall, convened the Dakar Financing Summit for Africa's Infrastructure in June 2014. The objective of the Summit was to build and strengthen innovative synergies between the public and private sectors towards mobilizing pan-African and global financial investments for infrastructure development on the continent. The Summit was a follow-up to a study undertaken by the NEPAD Planning and Coordinating Agency and ECA on mobilizing domestic resources for financing Africa's development, in particular the implementation of NEPAD projects. The Summit provided a high platform to specifically move forward the policy outcomes of the study.

B. Monitoring and evaluation of the programme for infrastructure development in Africa

6. ECA works closely with the NEPAD Planning and Coordinating Agency and the African Union Commission in developing the PIDA monitoring and evaluation framework and the African Infrastructure Database. In this regard, ECA is leading the creation of the African Infrastructure Network. The network would start with road and energy subsectors, and later be expanded to other infrastructure subsectors. Information from the network will be fed into the PIDA monitoring and evaluation framework, as a major source of information in support of the Virtual PIDA Information Centre. Another important outcome of the Regional Transport Infrastructure Forum was the recommendation for ECA to lead the production of the "African Infrastructure Outlook" – a publication that would focus on topical infrastructure issues, drawing from the wealth of information and knowledge that the African Infrastructure Network would generate.

III. Transport infrastructure

7. The transport sector offers high growth potential for Africa, but has not attracted the investment that is commensurate to this potential. Transport development would enhance the ability of African countries to establish competitive industrial sectors and promote greater industrial linkages. In essence, scaling up investment in transport, particularly regional transport infrastructure and services, would enhance regional markets, boost intra-

African trade and lower production and transaction costs, thereby making African countries more competitive in the global market.

C. State of African transport infrastructure

8. In general, the physical links in Africa fall short of expectations, and the network of infrastructure and services remain disjointed. Roads are the dominant transport mode, accounting for 90 per cent of interurban transport, but only about 20 per cent of the estimated 2,300,000 km of roads on the continent are paved, and the road density is low at an estimated 7.6 km/100 km² (see table 2).

Table 2

Regional distribution of road networks

Region	Length (km)		% Change 2000 – 2006	Density 2006 (km/100 km ²)
	2000	2006		
Central	115,667	186,475	61.2	3.5
East	445,018	476,558	7.1	6.5
North	292,790	347,451	18.7	3.0
Southern	801,751	853,676	6.5	13.5
West	409,377	434,910	6.2	8.0
Total	2,064,603	2,299,160	11.4	7.6

Source: Calculations by ECA (2010).

9. Overall, progress is being made at improving Africa's road network, although this is generally underreported, partly due to weak statistical capacity in many African countries. Ethiopia epitomizes the improvement that has been made in African countries. As a result of the effective implementation of the Road Sector Development Programme, the road network of Ethiopia has increased from 26,550 km in 1997 to 85,966 km in 2013 (an increase of 224 per cent). The quality of the country's road network has also improved substantially, with the proportion of roads in good condition increasing from 22 per cent in 1997 to 70 per cent in 2013. More notably, about 77 per cent of financing of the Road Sector Development Programme over the last 16 years came from internal resources, including the Government of Ethiopia and the Road Fund.

10. Africa's railway network comprises about 74,000 km for an area of about 29,600,000 km², representing a density of about 2.5 km/1,000 km² (see table 3). This compares with 40 km/1,000 km² in Europe. In Africa, the network consists mostly of single lines that penetrate inland from seaports with few interconnections, except in South Africa. The average technical speeds of African railways are about 30–35 km per hour.

Table 3

Railway network and comparative densities

Subregion	Total network (km)	Density (km/1000 km ²)
Northern Africa	16,012	2.3
Eastern Africa	9,341	2.2
Southern Africa	33,291	5.6
Central Africa	6,414	1.2
Western Africa	9,715	1.9
Africa total	74,773	2.5
World average	-	23.1

Source: Calculations by ECA (2010).

11. There are ongoing efforts to revamp Africa's railways, mostly through Chinese investment. For example, the Ethiopia–Djibouti railway is being constructed by the China Civil Engineering Construction Corporation. The 485 km Nairobi–Mombasa railway is being constructed by state-owned China Roads and Bridges Corporation. Nigeria is also

1. Development of the Intergovernmental Agreement on the Trans-African Highways Network

16. Lack of harmonized norms and standards constitutes an important barrier to trade and transport in Africa. In order to overcome this problem, ECA and the African Union Commission, in collaboration with the United Nations Office of the High Representative for the Least Developed Countries, Landlocked Developing Countries and Small Island Developing States, developed an intergovernmental agreement aimed at fostering the development of TAH.

17. The third session of the African Conference of Ministers of Transport took place in Malabo, Equatorial Guinea, on 7–11 April 2014, under the theme “Speeding-up transport programme delivery for facilitating Africa’s economic growth”. It adopted what is known as the “Malabo Declaration”, which includes the following transport instruments:

- (a) The Intergovernmental Agreement on TAH;
- (b) The African Road Safety Charter;
- (c) The Vision 2040 for Railway Revitalization in Africa;
- (d) Plans of action for air, maritime, road and rail transport.

18. The TAH Agreement was also endorsed at the twenty-third ordinary session of the Assembly of the African Union in June 2014, in Malabo.

19. ECA financed the preliminary study on the harmonization of the regional norms for highways, and assisted the African Union Commission to mobilize resources to finance the preparation of the Agreement and its annexes.

2. Road safety

20. The African Road Safety Action Plan for the period 2011–2020, developed in the context of the United Nations global Decade of Action for Road Safety, provides a framework to tackle road safety challenges on the continent. The United Nations system, through ECA and the Economic Commission for Europe, worked closely with African Union Commission to support the implementation of the Action Plan by member States.

21. ECA and the Economic Commission for Europe, in collaboration with the African Union Commission and the International Alliance for Responsible Drinking (IARD) – organized a workshop on road safety for English-speaking African countries in November 2014. The workshop discussed progress in the implementation of the African Road Safety Action Plan; provided a platform to increase the awareness of government officials about the United Nations road safety legal instruments; and promoted and discussed effective approaches to preventing drink-driving.

3. Transport facilitation

22. The United Nations system supported the African Union Commission and the regional economic communities in facilitating trade in Africa during the period under consideration (2012–2014). A project called “Capacity-building for Control Authorities and Transport operators to improve Efficiency of Cross-border Transport in Landlocked and Transit Developing Countries” was implemented for 36 months. The objectives of the project were to provide landlocked and transit developing countries with sustainable capacity to improve cross-border and transit transport operations and to develop corridor-based institutional and technological solutions to allow for the identification of transit transport operational barriers, design and implementation of readily applicable solutions.

23. The project achieved these objectives by applying a toolkit, which included two methodologies (the Cluster Development and the time–cost distance) in the Central Corridor linking the Port of Dar es Salaam with the landlocked neighbours of the United Republic of Tanzania – Burundi, Rwanda, Uganda and the eastern part of the Democratic Republic of the Congo. The methodologies were applied in Burundi, Rwanda and the United Republic of Tanzania, while the Democratic Republic of the Congo and Uganda participated in the project as observers.

24. The report on the status of implementation of trade and transport facilitation instruments and measures in Africa provides an assessment of the status of implementation of legal instruments related to trade and transport in Africa, from an international, regional and national perspective. Its findings and recommendations are based on insights from representatives of the regional economic communities, public sector, corridor organizations, the private sector; and end-users. It identifies the challenges to the implementation of the instruments and proposes possible solutions to overcome them.

25. ECA and partners jointly organized the African Regional Review Meeting of the Almaty Programme of Action for the landlocked developing countries from 16 to 18 July 2013. Senior government policymakers from 16 African landlocked developing countries and transit countries, attended the meeting. Representatives of the United Nations system organizations, regional and subregional organizations, development partners, civil society and the private sector also attended the meeting. The objectives of the regional review meeting were to review and take stock of the implementation of the Programme in Africa; and to identify policy recommendations and actions to enable those countries to fully participate in global trade and realize their full potential for sustainable and inclusive development. The outcome document of the meeting identified progress and obstacles in the implementation of the Almaty Programme of Action in its five priority areas, and contained several recommendations on how to accelerate the implementation of the Programme on the continent.

4. Air transport

26. ECA continues to participate in developing the regulatory framework for the Yamoussoukro Decision. In this regard, it reviewed the draft report of the study on competition rules, dispute settlement mechanism and consumer protection, which was presented at the third session of the Conference of African Ministers of Transport, in April 2014. ECA has also participated in other meetings to review and improve the regulatory framework for the liberalisation of air transport market in Africa

5. Carbon dioxide emissions assessment tool for future inland transport systems – For FITS

27. ECA and the Economic Commission for Europe, along with other regional commissions implemented a project entitled “Development and implementation of a monitoring and assessment tool for CO₂ emissions in inland transport to facilitate climate change mitigation”. As part of the project, an inland transport emission measurement model named “For Future Inland Transport Systems” (ForFITS) was developed. The tool provided a robust framework for analysing different scenarios for sustainable transport development, and proposes transport-policy strategies.

F. Recommendations for new areas of focus

28. Training on transport development: ECA’s The African Institute for Development and Planning is planning for new courses on transport infrastructure development, and energy policy for transformative development.

29. ECA will continue to track and analyse progress in the development of Africa’s infrastructure network. Efforts will be made to accelerate the establishment of the African Infrastructure Network and to build partnerships for the production of the African Infrastructure Outlook.

30. ECA will strengthen its research on the linkages between infrastructure development and industrialization. Areas of research interest are the role of infrastructure in sustainable and inclusive industrialization.

31. ECA will deepen its work in the area of policy and regulatory frameworks for transport infrastructure and services, including air transport.

32. ECA will lead the implementation of the Vienna Programme of Action in Africa focusing on the following priority areas: fundamental transit policy issues; infrastructure development and maintenance; international trade; regional integration and cooperation; and structural economic transformation.

IV. Energy infrastructure

G. “Business unusual”: current state of energy infrastructure

33. Notwithstanding the many interventions in the past ten years, the current energy infrastructure is proving to be a handbrake to transformative development in Africa. In many African countries, electricity infrastructure in particular appears to be regressing. Even in countries with advanced energy systems, such as South Africa, power deficits continue to affect the countries’ gross domestic product. The state of infrastructure in Africa can no longer be dealt with in a business-as-usual manner. Current efforts need to be tripled. The following facts summarize the African energy conundrum and the need for it to be examined. The current state of energy infrastructure is a major threat to the realization of Africa’s economic hopes.

34. The energy demand in the region shows remarkable growth. It has grown by 45 per cent from 2000 to 2012, but still only 4 per cent of the world’s total. Notwithstanding the recorded growth in demand, more people – particularly in rural areas and some urban centres – often do not have access to electricity (see map 2).

Map 2

Number of people without access to electricity in Africa

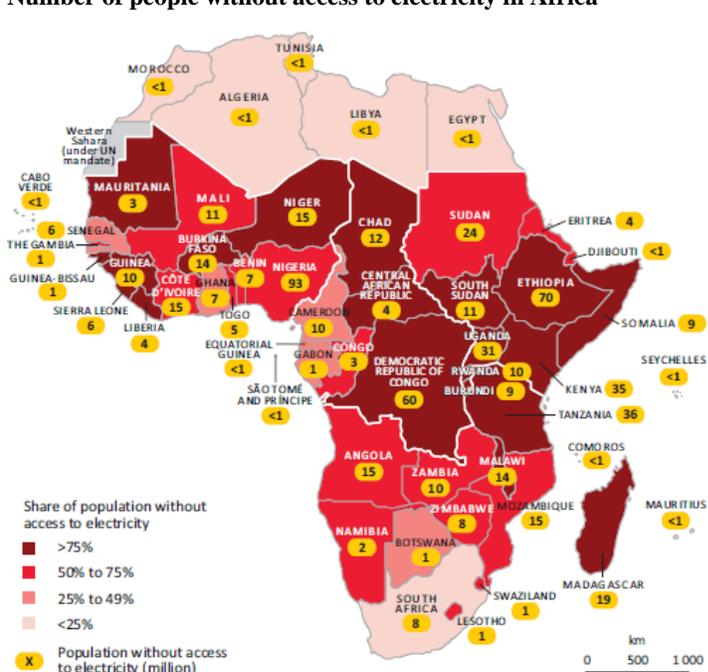
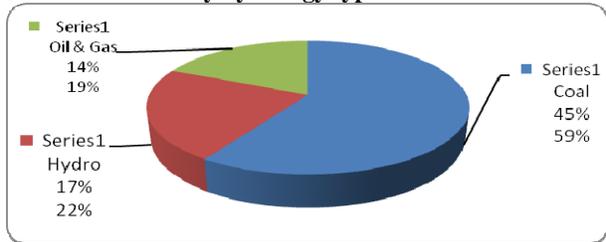


Figure 1

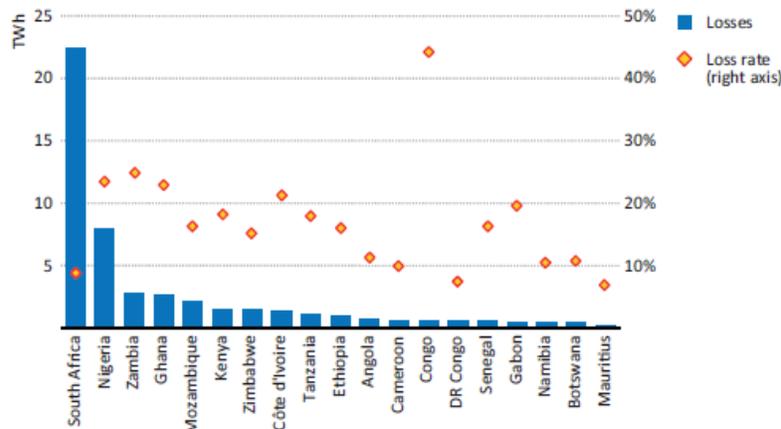
Source of electricity by energy types

Source: Derived from the International Energy Agency data set (2014).

36. The insufficient, unreliable or inaccessible grid supply has resulted in large-scale costly options that have now become the permanent feature of the African energy landscape. Many countries are resorting to oil- and gas-fuelled generators to keep the lights on and power their economies. While there has been some growth in the use of renewable energy for power generation, such use has not made an indelible mark in countries' baseline energy generation.

37. Africa is the only region in the world that the actual number of people without electricity is increasing. In addition, much inherent inefficiencies in the power sector have a major negative effect on the economy. The transmission and distribution losses reduce energy supply ultimately available to end-users by more than 20 per cent in some African countries (see figure 2).

Figure 2

Transmission and distribution losses and loss rates in 2012

Source: Africa Energy Outlook (International Energy Agency, 2014).

Available from

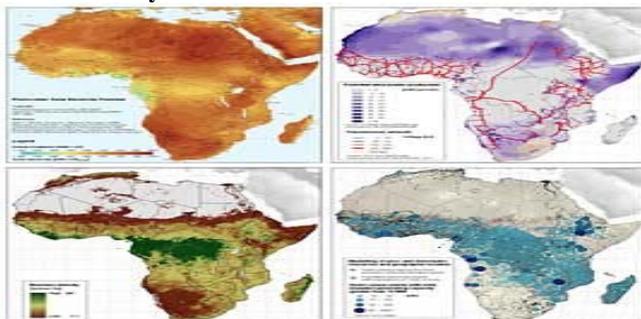
https://www.iea.org/publications/freepublications/publication/WEO2014_AfricaEnergyOutlook.pdf.

38. Unless there is an increase in investments in efficiency measures, including power grids, the rate of electricity blackouts will rise and thereby prevent Africa from achieving its development targets; because the amount of energy resources in Africa is more than sufficient to meet regional needs in the foreseeable future.

39. While Africa as a whole has generally huge potential of all the energy types, both renewable and non-renewable (see map 3), the reality is that more than 600 million people rely on traditional use of solid biomass for cooking, typically with inefficient stoves in poorly ventilated spaces. This has a further ramification in not only stunting economic progress, but also in the negative health standards for many low-income households. According to World Health Organization statistics, the number of people killed as a result of respiratory diseases is higher than the death caused by malaria.

Map 3

Mapping Africa's renewable energy resources for solar, wind, biomass and hydroelectric



Source: Renewable energies in Africa (European Commission Joint Research Centre, 2011).

Available from

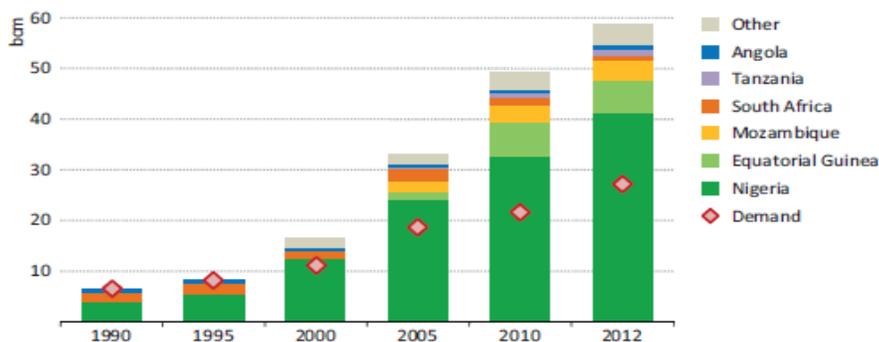
http://publications.jrc.ec.europa.eu/repository/bitstream/JRC67752/reqno_jrc67752_final%20report%20.pdf.

40. Lastly, more than 80 per cent of households in Africa use solid biofuels or biomass for cooking. In particular, many rural households still lack access to efficient and modern cooking appliances, notwithstanding the plethora of initiatives that have been tried on clean cook stoves in Africa over the past three decades.

41. In the context of the above challenges, as well as the economic transformative agenda, Africa has to benefit from all its energy resources for the greater good of its people. This also includes non-renewable resources such as oil and gas. In 2013, Africa – led by Nigeria – produced 5.7 million barrels per day of oil – mainly for export purposes for the oil production levels vis-à-vis demand in 2012). Benefiting this resource and others is, therefore, high on the African energy agenda, as demonstrated in the PIDA projects (discussed above). Opportunities on clean energy resources are immense.

Figure 3

Sub-Saharan Africa oil production by country and total demand



Source: Africa Energy Outlook (International Energy Agency, 2014).

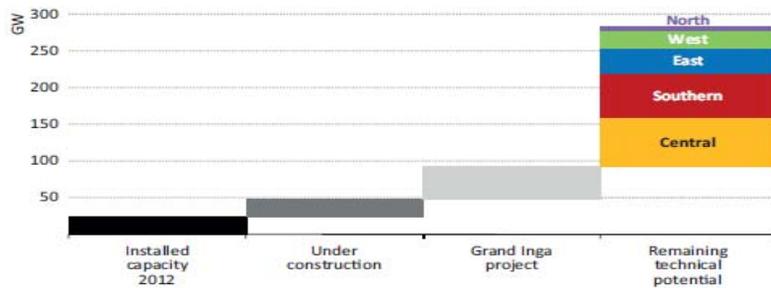
Available from

https://www.iea.org/publications/freepublications/publication/WEO2014_AfricaEnergyOutlook.pdf.

42. The most defining renewable energy resource is hydro, which the continent is blessed with in abundance, and this source should ideally provide the continent with most of its power needs. At present, this resource is underexploited, notwithstanding the increasing hydropower projects that are being completed (notably, the Grand Ethiopian Renaissance Dam, which will provide 6,000 megawatts of power once it is complete).³ The total technical potential of Africa's hydro is estimated at 283 gigawatts or approximately 1,200 terawatts per hour per year (see figure 4). This represents 8 per cent of global technical potential.

³ Chen, Huiyi, and Ashok Swain, "The Grand Ethiopian Renaissance Dam: Evaluating its sustainability standard and geo-political significance", *Energy Development Frontier*, vol. 3, No. 1, pp. 11-19 (2014).

Figure 4
Technical potential of hydro resources in Africa



Source: Africa Energy Outlook (International Energy Agency, 2014).

Available from

https://www.iea.org/publications/freepublications/publication/WEO2014_AfricaEnergyOutlook.pdf.

43. Second to biomass, hydro is the most used renewable mainly for electricity generation in Africa. Other most used energy source is solar, although it can be argued that it is not used optimally. Africa generally has not less than 320 days per year of solar irradiance levels (of approximately 2,000 kWh/m²). This is twice the average level in Germany, one of the leading countries in solar energy technology.

44. Arguably, the greatest challenge that African leaders are facing is how to sustainably and innovatively finance clean energy infrastructure in particular. The African Energy Leadership Group, inaugurated during the World Economic Forum at Davos, Switzerland, in January 2015, has a focus of finding innovative ways of financing infrastructure in Africa. The African Energy Leadership Group will seek to ensure that the energy sector becomes the driving force for economic transformation for long-term development.

H. Strategic and priority issues in energy in Africa

45. Energy is the catalyst for development of essential economic sectors in Africa, such as industrial, commerce or service, transport and household sectors. Without adequate and reliable energy, these sectors cannot develop optimally. The strategic priority areas, with respect to energy, can be classified under: the need to diversify the energy supply; development of robust and innovative regulatory and financing mechanisms to manage the energy systems.

46. Energy supply in most African countries, particularly in the power sector, often comes from single sources. In southern Africa for instance, the bulk of their electricity comes from coal-fired power plants. Since 2008, this energy supply has been under threat, as aging infrastructure of coal-fired stations (particularly in South Africa) has reduced the capacity to generate more energy. Many countries in Africa face similar energy insecurities caused by an undiversified energy supply. Under this key African priority, the following needs to be paid special attention to:

- (a) Increasing energy generation capacity, paying particular attention to cross border projects, especially in hydro and gas projects;
- (b) Mapping renewable energy resource to determine the technical, exploitable and economically feasible renewable energy sources;
- (c) Increasing energy efficiency in the transport, residential and industrial sectors, with more focus on transmission and distribution;
- (d) Creating forward and backward linkages in the energy systems, especially direct linkage to the economy;
- (e) Localizing energy technologies, especially clean technologies, in order to stimulate local manufacturing and regional trade on technologies.

Regulatory and finance issues

47. Large-scale investments are very important in ensuring adequate energy infrastructure. However, a good environment (especially for private sector investments) has to be created. Investments in infrastructure are usually capital and skills intensive. In addition, projects often have a long gestation period. In this environment, the rules of the game have to be clear, transparent and predictable. This has been one of the challenges and a strategic area of intervention – how to assist countries to design a good and facilitative environment that will make investments in energy infrastructure possible. Accordingly, the areas of focus in this strategic priority area are regulatory mechanisms to better manage energy systems; project packaging and bankability; innovative finance regimes and unbundle the energy supply to attract private sector participation and management.

Economic Commission for Africa's focus on energy infrastructure

48. The overall focus and hope of ECA intervention in support of energy infrastructure, is to achieve increased energy access in Africa in through the support of PIDA, SE4ALL, Africa Power Vision, African Clean Energy Corridor, and other international and continental initiatives. The Commission is making intervention in the following areas: investments in energy efficiency; private sector participation; localization of clean energy technologies; modern biofuel development; and the cross-cutting issue of gender mainstreaming in energy service provision.

Development of pro-poor public-private partnerships for rural energy provision

49. This project has been implemented in collaboration with other regional commissions since 2012. It seeks to increase participation of the local private sector in clean energy, especially for improving rural energy access (e.g. the pro-poor public-private partnerships in clean energy). The initiative tackles the lack of a reliable and affordable energy service, as a key challenge for rural poverty reduction; the use of traditional biomass fuel and its negative effect on the rural environment; and the building of credible structures or institutions, as critical in ensuring that projects are environmentally responsive, socially sensitive, economically viable, and politically feasible. The initiative, which concluded in May 2015, achieved the assessment of policy options, good practices and business models for public-private partnerships in the provision of renewable energy goods and services in rural areas. A designed a module on pro-poor public-private partnerships and establishment of a demonstration project using the principles of pro-poor public-private partnerships in Lesotho are other major highlights of the project.

Promoting energy efficiency investments in Africa

50. The Commission believes that financing energy efficiency in Africa is mainly not prioritized, notwithstanding the obvious benefits. Even though there is high internal rate of returns, energy efficiency appears to not have captured the attention of many investors and local commercial banks. In collaboration with the other regional commissions, and particularly taking lessons from the Economic Commission for Europe's experience in Europe, this initiative seeks to increase investments in energy efficiency in Africa for sustainable development and climate change mitigation. Through 2013–2015 period, the initiative provided training on energy efficiency project preparation and financing; produced case studies report on best cases of regulatory and institutional frameworks for energy efficiency investments. At the conclusion of the initiative, the fifth International Forum on Energy for Sustainable Development was held in Hammamet, Tunisia, in November 2014, with a theme on financing energy efficiency projects portfolios.

Localization of clean energy technologies in Africa

51. Clean energy should not only increase energy access, but should directly contribute to the African industrialization agenda. Localization of clean energy technologies, particularly solar, small hydro and biomass technologies, could have two-pronged benefits: improved local manufacturing (and associated job creation opportunities) and improved rural energy access. However, localization in Africa is often impeded by a number of interlinked constraints: inaccurate resources assessment and baseline determination; lack of technology road mapping to determine competitive areas of entry for many countries; national and even regional systems of innovations often do not support localization; no

value chain approach to energy development and the need for improved regulatory environment

52. This initiative, which started in 2014, developed a robust localization model. The model was applied to modern biomass technology development in Africa. An expert group meeting was held in Rwanda in November 2014, to validate the findings and make recommendations on the localization of technologies. The model, which provides recommendations on how to localize technologies for inclusive development, will now be applied to other technologies, such as solar and small hydro in 2015.

Gender mainstreaming in bioenergy development in Africa

53. Of the 1.2 billion people living on one dollar a day, 70 per cent are women,⁴ and the collection and use of biomass is mostly the responsibility of women and girl children. The use of low quality energy options and inefficient conversion devices pose health risks to women in particular. Policies for energy investments should target increasing access to energy for increased productivity and reducing drudgery for women – as a lack of investment in low-cost energy supply systems compels women to continue using firewood for cooking and lighting, with the associated health and safety problems.

54. In 2014, the African Union Commission, in collaboration with ECA and the NEPAD Planning and Coordinating Agency, and as a significant component of the gender mainstreaming African Bioenergy Policy Framework and Guidelines, carried out a study on the concept of gender mainstreaming and the potential roles of women in the bioenergy sector. The study was validated by a group of African energy experts at a jointly organized ad hoc meeting held in Kigali, Rwanda in December 2014.

Modern biofuel development

55. This supports the implementation of the African Bioenergy Framework and Policy Guidelines, which the African Heads of State and Government adopted at the Assembly of the African Union in January 2013. The project seeks to increase the share of modern biofuels for the household and transport sectors. It deals with the following issues: insufficient supply of electrical energy; high cost of energy goods and services; generally inefficient energy distribution approaches and generally low security of energy supply

56. The landlocked countries that will benefit from this initiative include Botswana, Burundi, Cameroon, Malawi, Swaziland and Uganda. Some of the activities planned include training on packaging projects, knowledge sharing on successful best experience, and dedicated specialized technical assistance on regulatory capacity-building, finance mobilization and biofuel resource assessment.

I. Recommendations and further areas of focus

57. Identification of financing and de-risking options in the context of global partnerships for projects identified under SE4ALL. Africa needs more than double of the current investments in order to create an infrastructure that will ensure that **ALL** its population have adequate to affordable energy services. There should be more investigation on how this funding gap can be bridged, particularly how to ameliorate the inherent risks of funding large infrastructure project and rural energy provision.

58. Development of harmonized regulatory framework for clean energy deployment with focus on standardization, regional systems of innovation, global and regional value chain and trade. Africa generally lacks innovation in the production of renewable energy and energy efficiency technologies. Most of the technologies in circulation are wholly imported from the West and East.

⁴ Lydia Muchiri, *Gender and equity in bioenergy access and delivery in Kenya* (Practical Action Eastern Africa, 2008). Available from http://www.cas.ed.ac.uk/_data/assets/word_doc/0007/24793/Gender_and_Equity_in_Bio_energy_Access_and_Delivery_in_Kenya_final.doc.

59. Focus on the regulatory framework for decentralized and distributed energy systems for rural development, including generation and distribution.
60. Assessment of renewable energy resources to determine the economic and financial viability, especially with regard to nexus considerations (land, water, agriculture and food, energy).

V. Conclusion: Investment in Africa's infrastructure

61. African countries themselves fund a large share of infrastructure projects on the continent – 46.9 per cent or \$46.7 billion out of a total of \$99.6 billion in 2013. This is set to grow over time, as African countries continue to increase their budget allocation for infrastructure development. While overall budget in African countries increased by 3 per cent in the 2011–2013 period, budget allocations for infrastructure increased by 8 per cent in the same period.
62. Several African countries stood out in 2012 in terms of allocating large shares of their overall budget to the infrastructure sector. For instance, 44 per cent for Cabo Verde; 39 per cent for Namibia; 28 per cent for Uganda; and 24 per cent for South Africa. Cabo Verde and Uganda continued with this trend in 2013.
63. China is the biggest investor in Africa's infrastructure. Lending from China per year to African countries, excluding North Africa, was estimated at \$13.4 billion in 2012 and 2013. Most of this has been on transport, particularly railway projects in Eastern Africa. China announced her desire to scale up its direct investment in Africa to \$100 billion and emphasized the deepening of her involvement in Africa's regional infrastructure projects. China has also promised to assist Africa to build a high-speed railway network.
64. Africa's traditional partners have continued to fund infrastructure projects on the continent, but their investment is nowhere near that of China. In 2013, the European Commission and France committed \$1.6 billion and \$2.5 billion respectively, while the United Kingdom and Germany committed \$1 billion each. The United States of America has committed \$7 billion to the energy sector via its multi-year Power Africa initiative.
65. The direct involvement of Heads of State and Government has raised the profile of regional infrastructure programmes and increased spending on projects in these programmes. This is particularly the case for the NEPAD PICI, where eight Heads of State and Government are championing projects with regional dimension across the continent. PICI and PIDA have demonstrated the political determination of these leaders to tackle the inadequacy of Africa's infrastructure networks.