

## ENERGY DIALOGUES IN AFRICA: IS THE GRAND ETHIOPIAN RENAISSANCE DAM TRANSFORMING ETHIOPIA'S REGIONAL ROLE?

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GERD viewed from the construction site in Ethiopia, right section.

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## ABSTRACT

Major hydropower projects, such as the Grand Ethiopian Renaissance Dam (GERD) in Ethiopia, invite enquiry into the potential to increase the generation, transmission and distribution of power, how best to finance these infrastructures and how to balance them with the call for a sustainable development approach. Analyses of these projects make little reference, however, to the potential for interregional co-operation that goes beyond the construction of the dam and a focus on power pooling.

Concentrating on the GERD, this paper identifies several challenges to energy co-operation between Ethiopia and regional stakeholders. It argues that Ethiopia's ownership of the GERD, the recent trade agreement between SADC, the Common Market for Eastern and Southern Africa and the East African Community, and growing interest in regional power pooling have created a timely opportunity for greater energy co-operation. Such co-operation will be sustained by an increase in power supply in these regions, but also by shifting national perspectives on regional prospects.

## ABOUT THE AUTHOR

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## ABBREVIATIONS AND ACRONYMS

CFA	Comprehensive Framework Agreement
COMESA	Common Market of Eastern and Southern Africa
EAC	East African Community
EAPP	Eastern Africa Power Pool
EEPCo	Ethiopian Electric Power Corporation
ESIA	Environmental and Social Impact Assessment
GERD	Grand Ethiopian Renaissance Dam
GTP	Growth and Transformation Plan
IGAD	Intergovernmental Authority on Development
IPoE	International Panel of Experts
ITEAI	Initial Trans-boundary Environment Impact Assessment
MW	megawatts
NBI	Nile Basin Initiative
PIDA	Programme for Infrastructure Development in Africa
REC	regional economic community
SAPP	Southern African Power Pool
TESIA	Trans-boundary Environmental and Social Impact Assessment
TFTA	Tripartite Free Trade Area



Photo: A Maupin, 7 June 2015

*The Grand Ethiopian Renaissance Dam in Ethiopia*

## INTRODUCTION

'[T]he forthcoming years might witness an overturning of the nature of Ethiopian exports. If electricity does eventually overtake coffee as the main export product, a one century-long economic cycle will have come to an end.'<sup>1</sup>

The Environmental Policy of Ethiopia, which was developed in 1997, recognises the importance of sustainable development in addressing cross-sectoral challenges in the country's environmental and natural resources management. More importantly, the policy highlights that, at the end of the 20<sup>th</sup> century, 'only 1 per cent of the potential of Ethiopia's vast water resources for irrigated agriculture and hydropower generation have been developed'.<sup>2</sup> Fifteen years later the Ethiopian government is launching the country's largest hydropower project thus far, with an estimated cost of \$4.7 billion and an expected capacity of 6 000 megawatts (MW). It will be located in north-west Ethiopia, approximately 750km west of Addis Ababa, the Ethiopian capital, and not far from the western border with Sudan. In addition to the obvious motive of tapping into Ethiopia's hydropower potential to benefit its largely unserved rural population, as well as meeting the country's growing urbanisation and industrialisation needs, the Ethiopian government also intends the country to become Africa's first low-carbon, 'green' economy. This implies increasing the sustainable and environmentally friendly components of the country's growth in several sectors, notably the energy sector.

Renewable energy, with a growing share in Ethiopia's energy mix, is a key factor in reaching the country's green goal. Therefore, the building of the Grand Ethiopian Renaissance Dam (GERD) is not only a claim to a fairer share of the Nile River Basin waters but also a first step towards gaining increased traction in continental and regional bodies such as the Common Market of Eastern and Southern Africa (COMESA), the East African Community (EAC) and the recently established Tripartite Free Trade Area (TFTA). The TFTA links the two aforementioned regional economic communities (RECs) with SADC.

In 2015 the heads of state of COMESA, the EAC and SADC officially launched the TFTA, which unites 26 African countries and the three RECs into an African 'mega-regional' trade area to facilitate the movement of goods, capital and people to strengthen economic relations. On the basis of the historical interconnections between several African countries, two power pools are already operational in the Eastern and Southern regions. The Southern African Power Pool (SAPP) was created in 1995, whereas the Eastern Africa Power Pool (EAPP) was established more recently, in 2005. Although the SAPP is at a more advanced operational stage, the EAPP is gaining momentum. More importantly, the EAPP's permanent secretariat has been established in Addis Ababa and has recently promoted an Independent Regulatory Board to share experiences, increase capacity building and co-ordinate a regional regulatory framework. Currently, the EAPP's generation capacity is

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- 1 Cuesta-Fernández I, 'Mammoth dams, lean neighbours: Assessing the bid to turn Ethiopia into East Africa's powerhouse', in Schölvín S (ed.), *A New Scramble for Africa?: The Rush for Energy Resources Southwards of the Sahara*. Farnham: Ashgate, 2015, pp. 93–110.
  - 2 Federal Republic of Ethiopia, 'Environmental Policy of Ethiopia', 1997, <http://www.mfa.gov.et/docs/ENVIRONMENT%20POLICY%20OF%20ETHIOPIA.pdf>.

approximately 45 000MW; by 2040, an additional capacity of 140 000MW will be required to address increasing demand on the back of the projected annual growth in this region.<sup>3</sup>

There is no doubt that the GERD will be a game changer in the region. Ethiopia's approach in constructing the dam raises challenges not only for downstream riparian states' hydro-hegemony in the Nile Basin but also for regional integration.<sup>4</sup> Control, competition and co-operation cannot be dissociated from such large hydropower schemes, and thus the hydro-hegemony framework provides an interesting entry point to examine power asymmetries in a region. This approach has contributed to an enriched water and energy resources-led debate on the construction of international relations, whereas in the past these resources were largely perceived as a source of either conflict or co-operation. Hydro-hegemony thus suggests that conflict and co-operation coexist in resource management. Unsurprisingly, this theory has gained traction in various political circles, notably to underpin diplomatic, discursive and legal tactics in the distribution of these resources among states.<sup>5</sup> However, hydro-hegemony analyses tend to exclude key topical elements in regional and international debates, particularly since the introduction of green economy development pathways, on the one hand, and the fostering of regional complementarities, on the other.

How could the GERD, this Ethiopian-nurtured hydropower infrastructure, unfold its regional and, eventually, Africa-wide potential as a key producer of electricity? While this project is a tempting beacon for greater integration and co-operation, national and regional policies strive to provide countries with an adequate framework to unwrap their energy sectors' green promises. Without claiming to be exhaustive or to challenge the tremendous amount of existing literature around hydropower projects and hydro-hegemony, this paper explores how current environmental and developmental narratives are driving recent infrastructure building in the African energy sector. Beyond the Ethiopian government's intent to put the country on a green pathway, the national importance attached to the building of the GERD reinforces the sense of urgency around the need to increase co-operative dialogues between regional and continental institutions on sustainable development priorities.

3 Irena (International Renewable Energy Agency), 'African Clean Energy Corridor: Analysis of Infrastructure for Renewable Power in Eastern and Southern Africa', 2015, [http://www.irena.org/DocumentDownloads/Publications/IRENA\\_Africa\\_CEC\\_infrastructure\\_2015.pdf](http://www.irena.org/DocumentDownloads/Publications/IRENA_Africa_CEC_infrastructure_2015.pdf).

4 Stemming from the extensive literature on water wars, the hydro-hegemony concept has recently been re-explored via a political economy approach by the London Water Research Group (LWRG). For further details, see LWRG, 'Applications and concepts', <https://lwrgr.wordpress.com/about/applications-and-concepts/>.

5 Tawfik R, 'Revisiting Hydro-hegemony from a Benefit-Sharing Perspective: The Case of the Grand Ethiopian Renaissance Dam', Deutsches Institut für Entwicklungspolitik Discussion Paper, 2015, [https://www.die-gdi.de/uploads/media/DP\\_5.2015.pdf](https://www.die-gdi.de/uploads/media/DP_5.2015.pdf).

## UNVEILING THE GRAND ETHIOPIAN RENAISSANCE DAM

Although Ethiopia has long yearned to increase its water-print on the Blue Nile River, attempts to trace the origins of the GERD project and, more significantly, its progression, have met with mixed success. From 1956–1964, the US Bureau for Reclamation helped Ethiopia to conduct studies for harnessing the Blue Nile's water potential.<sup>6</sup> Subsequently, four dams were proposed, including the Border Dam, an 85m-high dam with a potential installed capacity of 1 400MW, to be constructed 20km from the border with Sudan.<sup>7</sup> By all accounts, this dam scheme probably benchmarked the development of the Millennium Dam project. After construction had begun in April 2011, this project was referred to as the GERD.<sup>8</sup>

Located on the Blue Nile River (known in Ethiopia as the Abay River) in the Benishangul-Gumuz province, between the Lebeyate and Negro mountains near the Ethiopian–Sudanese border, the GERD has taken shape substantially since 2009. The project consists of a roller-compacted concrete dam with a height of 145m, complemented by a saddle dam.<sup>9</sup> From the reservoir to the dam site, the scheme extends over a 246km corridor between the mountains and will cover an area of 1 874km<sup>2</sup> once completed. Compared to Ethiopia's largest natural lake, Lake Tana, which can hold up to 32 billion m<sup>3</sup>, the Renaissance dam reservoir will hold twice this amount of water. Initially the planned capacity per year was 5 250MW with two surface powerhouses equipped with 15 units of 350MW. This changed in March 2012 when a revision of the dam design proposed adding another turbine and raising each turbine's installed capacity from 350MW to 375MW, thereby increasing the GERD's generation capacity to 6 000MW. As the project is being fast-tracked, with all phases constructed concurrently, the design revision was also necessary to adjust to the site's conditions, according to the construction company. The Ethiopian Electric Power

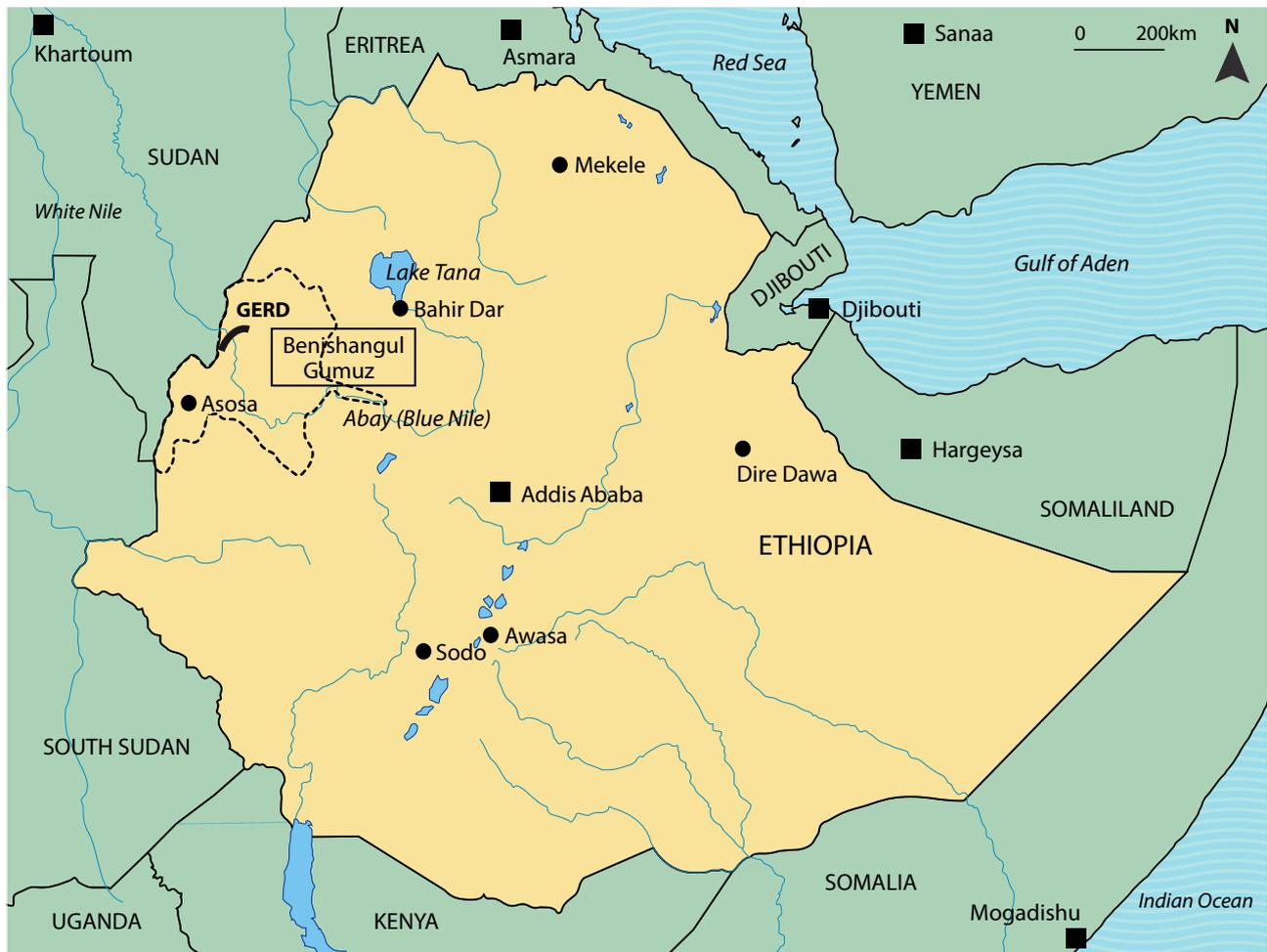
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6 The US Bureau for Reclamation's (USBR) involvement with the Nile River Basin dates back to the time when the US sought information on Egyptian irrigation systems. Since then, the USBR has provided technical assistance and training to Egypt, Ethiopia and Sudan. However, the US has had little control over the outcomes. Ethiopia and Sudan both experienced devastating civil wars and various political changes, in which the US' efforts in technical assistance, training programmes and studies were largely left unheeded. See USBR, 'The Bureau of Reclamation: History Essays from the Centennial Symposium', [http://www.usbr.gov/history/Symposium\\_2008/Historical\\_Essays.pdf](http://www.usbr.gov/history/Symposium_2008/Historical_Essays.pdf).

7 See Block P, Strzepek K & B Rajagopalan, 'Integrated Management of the Blue Nile River Basin in Ethiopia', IFPRI (International Food Policy Research Institute) Discussion Paper, 700. Washington DC: IFPRI, 2007.

8 According to various Ethiopian sources, the project was launched as the 'Grand Ethiopian Millennium Dam' on 2 April 2011. Later the same month it was renamed the 'Grand Ethiopian Renaissance Dam', after Prime Minister Meles Zenawi's speech on the Ethiopian Renaissance (*Hidase* in Amharic) during his anniversary celebrations on 28 May 2011 in Addis Ababa's Meskel Square and the establishment of a national council for the co-ordination of public participation in the construction of the GERD. See Horn Affairs, 'Ethiopia's new dam gets a council and a new name', 17 April 2011, <http://hornaffairs.com/en/2011/04/17/ethiopia-millennium-dam-gets-a-council-and-new-name/>.

9 This saddle dam, 5km long and 50m high, is reserved to protect nearby land from flooding.

**FIGURE 1** GERD: A PROJECT ON THE ETHIOPIAN–SUDANESE BORDER

Source: Author

Corporation (EEPCo), the state-owned national power utility of Ethiopia,<sup>10</sup> is the owner and manager of the dam, as well as the principal facilitator of funding with the Ethiopian government (by selling coupon-paying bonds to the Ethiopian population, including those living abroad). EEPCo has hired the Italian company Salini Impregilo SPA to take charge of engineering, procurement and construction of the dam.<sup>11</sup>

10 The Ethiopian Electric Power Corporation (EEPCo), which operates as the Ethiopian Electricity Agency and is supervised by the Ministry of Water, Irrigation and Energy, has recently unbundled into Ethiopian Electric Power, for generation and transmission, and Ethiopian Electric Service, for distribution.

11 This company has subcontracted Studio Pietrangeli, another Italian company, for the civil works design.

Beyond the dam's construction, the GERD project initially included the concurrent erection of transmission lines and access roads. In 2013, EEPCo signed an agreement with the Electric Power Equipment and Technology subdivision of the State Grid Corporation of China to start constructing the transmission lines, with several extensions.<sup>12</sup> While full delivery of this infrastructure was expected by 2016, contracts continue to be awarded by the Ethiopian government, notably to increase interconnections with neighbouring countries. For example, a 433km-long transmission line from Wolayita Sodo to the Kenyan border, which would ultimately allow the export of 2 000MW to Kenya, was commissioned in 2015.

Although the GERD was 47% complete by July 2015,<sup>13</sup> it is unlikely to be fully operational before 2018, a year later than expected. According to Salini Impregilo, some delays have occurred, mostly due to supply constraints and extreme working conditions on the site, given its location in a hot and arid area.<sup>14</sup> However, as promised by EEPCo officials, the first stage (the delivery of 750MW by the first two turbines) seems to be on schedule and is expected to reach completion by October 2016.<sup>15</sup> This first stage will allow Ethiopia to cover part of its growing electricity needs nationally and to export the surplus.

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Overall, Ethiopia's energy planning is directed by several strategic documents that aim to turn the country into a low carbon, middle-income economy

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## A PROJECT ROOTED IN ETHIOPIA'S GROWTH STRATEGY

While the GERD appears to be the flagship project of Ethiopia's plan to develop its energy infrastructure, it is only a small part of the country's ambitious energy and development programme. Overall, Ethiopia's energy planning is directed by several strategic documents that aim to turn the country into a low carbon, middle-income economy. While harnessing the Ethiopian energy and transport sectors towards a potential regional market, Ethiopia's vision pragmatically focuses on its domestic development challenges. Hence, the

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12 For example, a 1 000km-long double circuit of transmission lines from the GERD to the Dedesa and Holeta power stations with a 500Kv power transmission capacity is being built, as well as another 400Kv transmission line from the GERD to Beles and Bahir Dar, awarded to the same Chinese companies.

13 See Aiga Forum, 'Ethiopia working feverishly to start generating power from two of its big turbines at GERD', 14 October 2015, <http://aigaforum.com/news/Dr-Debretsion-on-GERD-Update-101515.htm>.

14 According to Salini, delays can be imputed to the difficulty in securing sufficient and reliable provisions of cement due to the remoteness of the GERD site and unsuitable locally produced cements. A solution was later found through improved mixes of cements, in co-operation with Ethiopian cement producers. This, in turn, has also contributed to improve the cement manufacturing process and the quality of local cement in Ethiopia. See *Hydro Review*, 'Fast track approach to design and construction at Grand Ethiopian Renaissance Dam', 27 July 2015, <http://www.hydroworld.com/articles/print/volume-23/issue-4/features/fast-track-approach-to-design-and-construction-at-grand-ethiopian-renaissance-dam.html>.

15 According to interviews with constructors on the GERD site (7 June 2015), confirmed by EEPCo comments during the South African International Renewable Energy Conference, Cape Town, 4 October 2015.

government seeks to bridge the gap between previous silo sector-based approaches with an overarching strategy.

Against this background, Ethiopia released its comprehensive National Energy Policy in 2013, which seeks to address its energy challenges by providing a reliable, affordable and self-sufficient energy supply. The policy prioritises hydropower development and a transition from traditional energy sources to green ones, such as wind and solar. The text refers to hydropower as ‘the backbone of the country’s energy sector development strategy, as it is the country’s most abundant and sustainable energy resource’.<sup>16</sup> However, despite the commitment to build small, medium and large hydropower plants and to increase access to energy rapidly, the national energy policy misses an important step. While it mentions the establishment of an energy institution to oversee the development and implementation of the integrated and cross-sectoral energy policies, no significant progress has been made in this regard. As stressed by Cuesta-Fernandez, Ethiopia’s legislation is lagging behind its construction plan, notably in terms of procurement procedures.<sup>17</sup>

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A large scheme of electricity transmission lines, combined with a distribution plan, a universal electrification programme and the building of smaller hydropower plants, permits Ethiopians to increasingly access modern energy sources

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In addition to this National Energy Policy, the Growth and Transformation Plan (GTP) I (2010/11–2014/15), which should be followed by a second plan for the 2016–2020 period, has contributed tremendously to increasing synergistic infrastructure development. While focusing on two sources of energy – bio-fuel and hydro – the GTP I also emphasises the need for a regional infrastructure development plan to close the gap between national electricity supply and demand.<sup>18</sup> Under this umbrella, a large scheme of electricity transmission lines, combined with a distribution plan, a universal electrification programme and the building of smaller hydropower plants, permits Ethiopians to increasingly access modern energy sources. Following an update of the Ethiopian Power System Expansion Master Plan (2006–2030) in 2005,<sup>19</sup> medium-sized hydropower plants such as Gilgel Gibe II (420MW), Tana Beles (460MW) and Tekeze (300MW) enhance Ethiopian generation capacity, and greater access to the grid has been achieved. Combined with EEPCo’s renovated Power Sector Development Programme (2010–2015),<sup>20</sup> this has allowed Ethiopian households’ access to electricity to increase from 13% in 2001 to 45% in 2011, with a target of 75% by 2016. This year also promises the inauguration of another

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16 See ‘National Energy Policy of Ethiopia’, <https://www.abysinnialaw.com/policies-and-strategies?download=1197:national-energy-policy-english>.

17 Cuesta-Fernández I, *op. cit.*

18 Federal Democratic Republic of Ethiopia, ‘Growth and Transformation Plan (GTP) 2010/2011–2014/2015’, MoFED (Ministry of Finance and Economic Development), Draft, Addis Ababa, 2010, [http://www.iea.org/media/pams/ethiopia/Ethiopia\\_GTP\\_2010to2915.pdf](http://www.iea.org/media/pams/ethiopia/Ethiopia_GTP_2010to2915.pdf).

19 See EEPCo (Ethiopian Electric Power Corporation), ‘Ethiopian Power System Expansion Master Plan update’, June 2006, <http://www.bgr.de/geotherm/ArGeoC1/pdf/06%20Energy%20master%20plan.pdf>.

20 See Intpow (Norwegian Renewable Energy Partners), ‘Highlights on Power Sector Development Program (2010–2015 GC)’, October 2011, <http://www.intpow.com/index.php?id=967&download=1>.

large hydropower dam, Gilgel Gibe III (1 870MW), which will double Ethiopia's existing generation capacity.<sup>21</sup>

On the eve of the release of the second national GTP for the 2016–2020 period, the Ethiopian government plans to dramatically increase the country's export revenues. In the GTP I, increasing bio-fuel production and utilisation was mentioned as a substitute for fuel imports, whereas hydro's sole purpose was to expand power generation. The Ethiopian government's ambitions were to reach a generation capacity of 8 000MW by 2015, despite an initial plan of 2 000MW by 2010. While developing the manufacturing sector and modernising agriculture are the cornerstones of the GTP II, electricity exports, transmission lines and distribution networks remain a key component. Against this background, this new five-year plan targets a national generation capacity of roughly 17 500MW by 2020.

### ETHIOPIA AS A REGIONAL ENERGY HUB?

Although Ethiopia's growing energy needs are increasing exponentially because of its high average annual growth rate of 10% over the past decade,<sup>22</sup> the energy outputs of its hydropower plants exceed its domestic needs, thereby allowing EEPCo to seriously consider exporting electricity to the region. Several scenarios have been explored to export surplus electricity from the GERD's 6 000MW output. With an energy potential of 15 692GWh, the GERD would be one of the largest producers of electricity derived from hydro on the continent.<sup>23</sup> The GERD planning scheme has integrated transmission lines, substations and interconnectors to allow EEPCo to realise its national ambitions. However, the potential success of these electricity exports depends largely both on the roll-out of regional infrastructure and economic development and on regional co-operation.

Overall, EEPCo trades about 100MW with Sudan and 65MW with Djibouti, using 220kv transmission lines in both cases. As noted earlier, 500Kv and 400Kv transmission lines need to be built between Ethiopia, Sudan and Djibouti to permit an increase in electricity exports. Ethiopia has also signed a Memorandum of Understanding with Kenya to deliver

21 EEP (Ethiopian Electric Power), Ethiopian Bulk Power Development and Regional Interconnection, Ethiopian Electric Power, Corporate Planning Directorate, Addis Ababa, 2014; EEPCo, 'Ethiopian Power System Expansion Master Plan Study', Draft Final Report, Executive Summary. New York: Parson Brincherhoff, 2014; EEPCo, 'Ethiopian Electric Power Corporation Integrated Planning', Main Report. London: Norton Rose London, 2012, [www.nortonrosefulbright.com/](http://www.nortonrosefulbright.com/).

22 According to the last Africa Economic Outlook, in 2013/2014, Ethiopia's economy grew for the 11th consecutive year, posting 10.3% growth. See African Economic Outlook, 'Ethiopia 2015', [http://www.africaneconomicoutlook.org/fileadmin/uploads/aeo/2015/CN\\_data/CN\\_Long\\_EN/Ethiopia\\_GB\\_2015.pdf](http://www.africaneconomicoutlook.org/fileadmin/uploads/aeo/2015/CN_data/CN_Long_EN/Ethiopia_GB_2015.pdf).

23 Notably in comparison with neighbouring dams on the continent, such as the existing Inga 1 and 2, which ideally have a combined gross energy generation of 12 800 GWh, or with the Kariba Dam, jointly operated between Zambia and Zimbabwe, which reaches about 10 000 GWh at best.

Whereas actual Ethiopian electricity sale contracts have been dealt with in the bilateral realm, multilateral co-operation will become essential to achieve the medium- to long-term plan to turn Ethiopia into a major regional electricity exporter

400MW per year (from Gilgel Gibe III). It also envisages future exports of 1 200MW to Sudan and 2 000MW to Egypt. Somalia, South Sudan, Uganda, Somaliland and Eritrea are also potential clients. In the long term, Tanzania and South Africa could also benefit from the completion of the dam's next stages. These links to the region are essential for the financial viability and sustainability of Ethiopia's GERD and future dams, as noted in several studies.<sup>24</sup> Whereas actual Ethiopian electricity sale contracts have been dealt with in the bilateral realm, multilateral co-operation will become essential to achieve the medium- to long-term plan to turn Ethiopia into a major regional electricity exporter.

Ethiopia's energy infrastructure for exporting electricity to the region has received external support, notably from the African Development Bank and the World Bank. Both international and continental financial institutions have agreed to provide finance for the transmission and distribution infrastructure, which includes a transmission line and interconnector to Kenya, to be completed by 2017.<sup>25</sup> Before Ethiopia's launch of the GERD project in 2011, the Millennium Dam was already included in the AU's Programme for Infrastructure Development in Africa (PIDA). PIDA represents the AU vision of an African energy system linking various African power pools by integrating major hydropower projects with cross-border oil and gas pipelines. The GERD is one of several high-priority PIDA projects to be completed by 2020 to facilitate electricity exports within the EAPP market.<sup>26</sup> As noted in both the Ethiopian plans and PIDA, the GERD project could be of significant regional benefit.

As has recently been pointed out, 'by virtue of its low-cost hydropower system, Ethiopia would be a strategic nerve centre for the EAPP grid'<sup>27</sup> and, given the low Ethiopian electricity prices, it is likely that Ethiopia will become the biggest exporter in the region.

## ETHIOPIA WITHIN THE EASTERN AFRICAN POWER POOL

African energy ministers have acknowledged that Africa will soon run out of surplus power capacity if planned projects are not implemented and commissioned on schedule. This state of play applies to all African regions, where growing energy needs are stymied by generation shortages. To address generation capacity differences between member states, African RECs have developed a general framework through which energy divisions and national organisations can manage regional energy issues. Africa's five power pools are

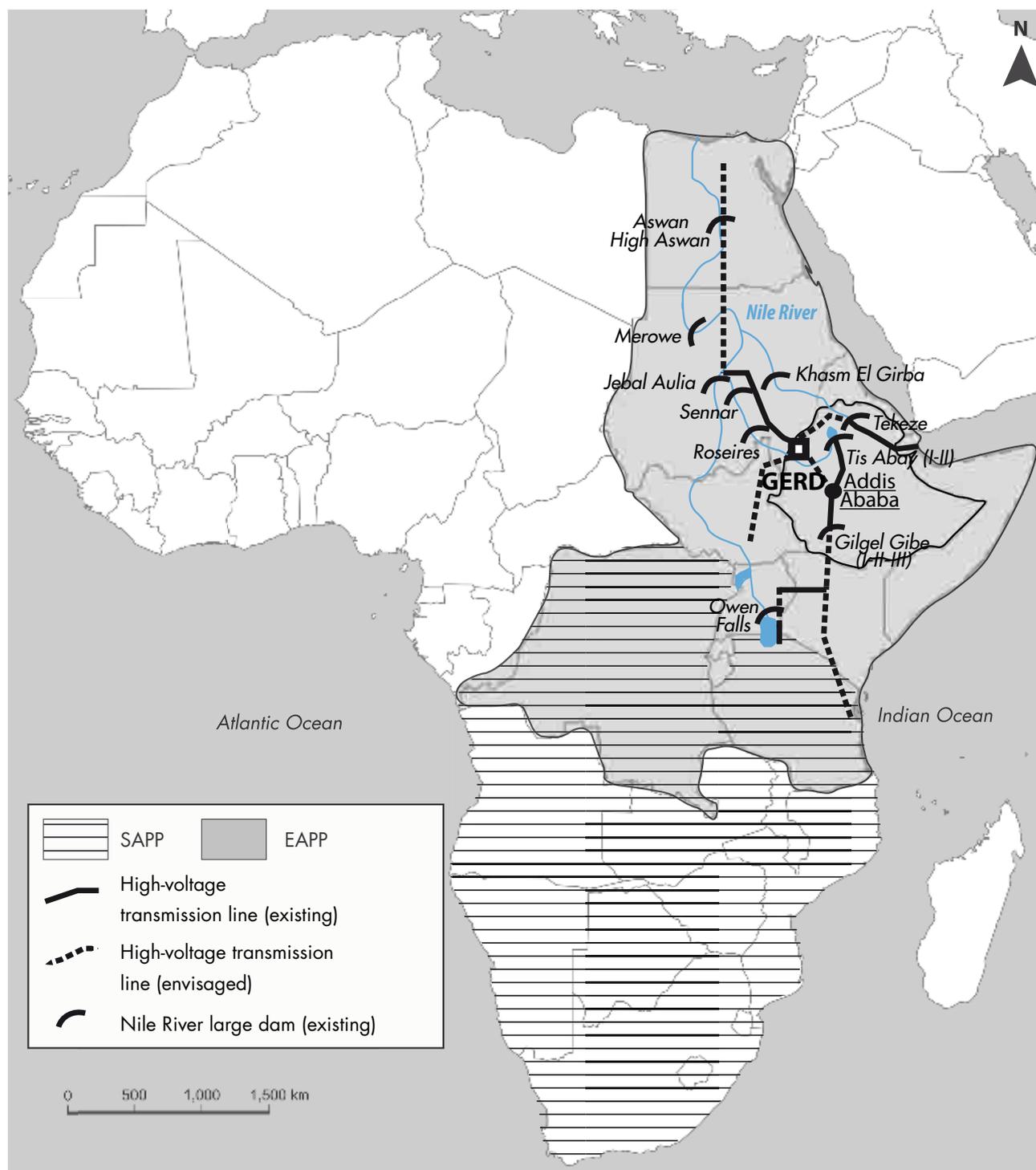
24 Kedebe E, 'The financing of the Grand Ethiopian Renaissance Dam (GERD)', 30 March 2015, <https://ezanakebede.wordpress.com/2015/03/30/the-financing-of-the-grand-ethiopian-renaissance-dam-gerd/>.

25 See AfDB (African Development Bank), 'AfDB launches US1.26B Kenya–Ethiopia electricity highway', 7 May 2013, <http://www.afdb.org/en/news-and-events/article/afdb-launches-us-1-26b-kenya-ethiopia-electricity-highway-11733/>.

26 Millennium Dam flagged in S4 (implementation and operation phase) in AU, NEPAD & AfDB, 'Programme for Infrastructure Development in Africa: Interconnecting, Integrating and Transforming a Continent', 2012, <http://www.afdb.org/fileadmin/uploads/afdb/Documents/Project-and-Operations/PIDA%20note%20English%20for%20web%202008.pdf>.

27 Irena, *op. cit.*

**FIGURE 2** THE GERD IN THE EAPP



Source: Author

a result of this approach.<sup>28</sup> Given Ethiopia's growth and the growing needs of the region, the GERD could serve as a hinge for the EAPP.

Created in 2005, the EAPP has a permanent secretariat based in Addis Ababa, which successfully promotes energy trade in the region. A relative newcomer, its activities were limited until the recent economic boom in East Africa, and now include 10 participating countries and their respective power utilities.<sup>29</sup> Sustained by the flourishing construction industry, regional power needs have increased dramatically and this, in turn, has thrust energy-related infrastructure development and enhanced energy co-operation and institutions into the spotlight. With a cumulative capacity slightly above 45 000MW and an average of 140GW of additional capacity in the future, the EAPP is facing multiple challenges, notably between member states and around the strengthening of the regional institutional architecture.

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In spite of strong national growth rates and optimistic regional demand forecasts with vertiginous peaks, it is crucial to plan national energy projects carefully to ensure that they are aligned with both the current and future regional market outlook, including reducing emissions towards a sustainable regional development

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First, the EAPP has taken steps towards creating a regional electricity market, which would draw on several national energy projects that could service the whole of East Africa.<sup>30</sup> Apart from the two largest hydropower schemes of the GERD and the recently completed Gilgel Gibe III, Ethiopia is also assessing 12 other hydropower projects to be initiated by 2020, according to EEP Co. This excludes the additional geothermal, wind and solar plant projects Ethiopia is considering, not to mention others planned in the region.

However, the largest energy producer and consumer in the region is Egypt. With almost 65% of the EAPP's installed capacity, mostly derived from thermal (natural gas) and oil-fired plants, Egypt is far ahead of Ethiopia, Sudan, Kenya and Tanzania. This highlights the serious disparities among national energy systems in the region. In spite of strong national growth rates and optimistic regional demand forecasts with vertiginous peaks, it is crucial to plan national energy projects carefully to ensure that they are aligned with both the current and future regional market outlook, including reducing emissions towards a sustainable regional development.

Second, while this regional market is still in its infancy, the TFTA might offer an avenue to strengthen and enforce co-ordination and co-operation. Recent analysis by Schölvin and Wrana, which compared the potential benefits and pitfalls of the TFTA for Egypt, Ethiopia and Kenya, noted that in the long term the TFTA could significantly expand co-operation

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28 A power pool is a mechanism for power exchange between two or more utilities to balance electricity supply over a larger network.

29 See EAPP (Eastern Africa Power Pool), 'Inter-Utility Memorandum of Understanding', Addis Ababa, 2005, [www.eappool.org](http://www.eappool.org). Burundi, the Democratic Republic of the Congo, Egypt, Ethiopia, Kenya, Rwanda and Sudan initially adopted the EAPP as the specialised electric power institution for COMESA, and were joined by Tanzania, Libya and Uganda between 2010 and 2012. Djibouti is in the process of joining while Eritrea and South Sudan are potential members.

30 EAPP & EAC (East African Community), *Final Master Plan Report: Regional Power System Master Plan and Grid Code Study*. EAC: Addis Ababa, 2011.

on energy.<sup>31</sup> Beyond the development of energy and transport infrastructure, the TFTA opens a path to link the Eastern and Southern African power pools while harmonising legislative and institutional frameworks.<sup>32</sup> Unlike the SAPP, the EAPP has the difficult task of co-ordinating regional energy project planning and development across several regional institutions, notably the EAC and the Nile Basin Initiative, which includes the Nile Basin Regional Power Trade Project. Hence several regional legal instruments play a role in the regional energy sector, such as the EAC infrastructure division, which drives the EAC energy protocol, along with various strategies and plans for pressing regional initiatives forward. Under COMESA's umbrella, all these institutions have contributed to the elaboration of the EAPP Power Master Plan.<sup>33</sup> However, future energy choices rest on the policies and infrastructure-building capacity of regional members.

Against this background, the implementation of an operational EAPP electricity market in the context of Eastern African countries with their different political, economic and institutional frameworks requires a significant shift in the way each country approaches energy issues. It is important that they now focus on regional planning alongside their national priorities. Although Ethiopia and its neighbouring countries urgently need to deal with energy shortages, they face different structural issues. Therefore, these countries have a common interest in strengthening their national energy sectors, starting with strong policies and institutions. This brings into question the major role that the EAPP and Ethiopia are expected to play in not only fostering regional co-operation but also enhancing compatible policies and institutions.

## FROM WATER TOWER TO POWERHOUSE

With 12 river basins, Ethiopia has always held the potential to become Eastern Africa's water tower and powerhouse.<sup>34</sup> However, the Nile River basin has a singular history when it comes to treaties and agreements regarding its waters. As mentioned above, an additional challenge Ethiopia faces in becoming the regional powerhouse lies in the Nile River basin institutions and infrastructures.

In 1929 a colonial treaty gave Egypt veto power over any upstream projects on the Nile, and in 1959 a bilateral treaty, which was signed only between Egypt and Sudan, divided the Nile's waters between them. Until recently, a multilateral agreement was both non-existent and improbable. However, in 1999 the Nile Basin Initiative (NBI) brought together all the riparian states for the first time. Designed as a broker institution to implement basin-wide

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31 Schölvén S & J Wrana, 'From the Cape to Cairo? The Potential of the Tripartite Free Trade Area', SAIIA Occasional Paper, 221, September 2015, <http://www.saiia.org.za/occasional-papers/from-the-cape-to-cairo-the-potential-of-the-tripartite-free-trade-area>.

32 Makonnen T & H Lulie, 'Ethiopia, Regional Integration and the COMESA Free Trade Area', SAIIA Occasional Paper, 198, 2014, <http://www.saiia.org.za/occasional-papers/ethiopia-regional-integration-and-the-comesa-free-trade-area>.

33 See EAPP & EAC, *op. cit.*, Executive Summary; EAPP, 'EAPP Corporate Plan (2012–2014)'. Addis Ababa: EAPP Permanent Secretariat, 2012, [www.eappool.org](http://www.eappool.org).

34 Tawfik R, *op. cit.*

projects and to negotiate a Comprehensive Framework Agreement (CFA) that would lean towards the establishment of a permanent Nile Basin Commission, the NBI provided Ethiopia with a platform to launch hydropower projects on the Blue Nile. Ten years later, most of the upstream riparian states decided to open the CFA for signature, despite the lack of consensus on this agreement's content with the two downstream riparian states, Egypt and Sudan.<sup>35</sup> To date, only Ethiopia, Rwanda and Tanzania have signed and ratified the CFA. The unwillingness of other states to sign, political instability and several unresolved border disputes have prevented the construction of several large projects on the Nile River. Projects that have been completed include the Aswan Dam (1933) and the Aswan High Dam (1970) in Egypt, as well as the Sennar Dam (1925), the Jebel Aulia Dam (1937), the Khasm el Girba Dam (1964) and the Roseires Dam (1966) in Sudan. More recently, the Merowe Dam was completed in 2009. In Ethiopia, hydropower schemes that are operational include Tis Abay I (1953) and Tis Abay II (2001). The Tekeze Dam was completed in 2009 and the Tana-Beles run-of-the-river scheme was built in 2010. In addition to the Ethiopian projects, several hydropower plants also exist in Uganda, such as the Kiira and Nalubaale hydropower stations on the Owen Falls, or are currently under construction, for example at Bujagali in Uganda and Rusumo in Rwanda.<sup>36</sup>

Today, hydropower generation facilities represent approximately 26% of the estimated power capacity of the Nile River basin of 20GW. However, as pointed out in the 2012–2016 NBI strategic plan, it is necessary to integrate existing and future hydropower schemes under a comprehensive basin-wide development framework that would include all riparian states and their respective projects.<sup>37</sup> Derived from the 1999 NBI strategic action plan, this overarching strategy emphasises the strengthening of the NBI centres, as well as the importance of knowledge building and knowledge sharing, notably between sub-basins. For example, in 1999 Ethiopia established the Abay River Basin Authority, which became fully functional in 2011,<sup>38</sup> yet there is no clear link between this authority and the Eastern Nile Technical Regional Office, an NBI centre located in Addis Ababa.<sup>39</sup> In addition to playing a key role in the establishment of the NBI, Ethiopia has been the chair of the regional Intergovernmental Authority on Development (IGAD) from 2008–2014. This role has provided the country with additional leverage to enhance multi-faceted regional co-operation. As a result, beyond a focus on drought and disaster control on the one hand and peace and security on the other, IGAD now also has a robust mandate

35 Article 14(b) on water security was rejected and no consensus on the formulation was found by 2010. See NBI (Nile Basin Initiative), 'Agreement on the Nile River Basin Cooperative Framework', 2010, <http://www.nilebasin.org/images/docs/CFA%20-%20English%20%20FrenchVersion.pdf>.

36 See NBI, 'State of the River Nile Basin Report', Chapter 6, 2012, <http://nileis.nilebasin.org/system/files/Nile%20SoB%20Report%20Chapter%206%20-%20%20Hydropower.pdf>.

37 See NBI, 'NBI Overarching Strategic Plan 2012–2016', [http://www.nilebasin.org/images/docs/NBI\\_overarching%20strategic%20plan\\_final\\_abridged%20version.pdf](http://www.nilebasin.org/images/docs/NBI_overarching%20strategic%20plan_final_abridged%20version.pdf).

38 See Abay Basin Authority, <http://www.aba.gov.et>.

39 The Eastern Nile Technical Regional Office is in charge of programme management and technical support, in line with the Nile permanent secretariat strategy (Nile-Sec) located in Entebbe, Uganda.

in terms of economic co-operation and integration. Thus it is not surprising that IGAD has provided support to the GERD project with an emphasis on regional benefits.<sup>40</sup>

Basin-wide integrated planning and regional co-operation are also central to ensuring sustainable development in the region. As mentioned earlier, hydropower projects, small and large, are high on the agenda of several riparian states, but it is doubtful that environmental impact assessments have been comprehensively and transparently conducted.<sup>41</sup> During the GERD project's development, several constituencies pleaded for better impact assessments. For example, the dam's basic design report was released in 2010, whereas the environmental and social impact assessment (ESIA), as well as the hydrological, reservoir simulation and stability reports, was still being produced. Furthermore, following the announcement of the building of the GERD in April 2011, the Ethiopian government invited Egypt and Sudan to constitute an International Panel of Experts (IPoE) on the GERD in an attempt to review the project. Without interrupting the building work, the IPoE started examining the GERD project documents that were made available.<sup>42</sup> In 2013, it prepared a final report that sought to inform the governments of Egypt, Ethiopia and Sudan on the GERD project's performance.<sup>43</sup> As noted in this final report, the objective was 'to build confidence among the three countries around the GERD'<sup>44</sup> in order to convince downstream countries Egypt and Sudan of the potential shared benefits that could be derived from the GERD. During this time, an initial Trans-boundary Environment Impact Assessment (ITEIA) was also conducted to complement the Ethiopian ESIA. Although this Ethiopian study was limited to the future impact zones around the dam site, the ITEIA aimed to identify the beneficial and adverse impacts of the GERD for Egypt and Sudan. It could be argued that these two assessments should have been integrated into a broader basin-wide impact study to meet the NBI strategy's criteria. As noted by the IPoE experts, both studies lacked analysis of water quality and sedimentation. More importantly, the ITEIA was 'regarded as a scoping report' in 2013.<sup>45</sup> Thus it is not surprising that they recommended that a full TESIA be conducted. After several hold-ups, a trilateral agreement was finally established between Egypt, Ethiopia and Sudan in 2015 on the basis of the IPoE recommendations regarding the conduct of a TESIA and co-ordination of the dam's first filling and further operations.<sup>46</sup> However, this

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40 See Inter-governmental Authority on Development, 'IGAD staff contribute to the Grand Ethiopian Renaissance Dam', 7 January 2013, [http://igad.int/index.php?option=com\\_content&view=article&id=548:igad-staff-contribute-to-the-grand-ethiopian-renaissance-dam&catid=1:latest-news&Itemid=150](http://igad.int/index.php?option=com_content&view=article&id=548:igad-staff-contribute-to-the-grand-ethiopian-renaissance-dam&catid=1:latest-news&Itemid=150).

41 Chen H & A Swain, 'The Grand Ethiopian Renaissance Dam: Evaluating its sustainability standard and geopolitical significance', *Energy Development Frontier*, 3, 1, 2014, pp. 11–19.

42 This IPoE on the GERD included two experts from these three countries, with backgrounds in the engineering, social and environmental sciences, as well as four international experts.

43 IPoE (International Panel of Experts) on Grand Ethiopian Renaissance Dam Project (GERDP), Final Report, Addis Ababa, 2013.

44 *Ibid.*

45 *Ibid.*

46 These three countries signed a Declaration of Principles in March 2015. See Aigaforum, 'Agreement on Declaration of Principles', 5 March 2015, <http://aigaforum.com/documents/Final-full-text-of-egypt-sudan-ethiopia-agreement-on-nile-use.pdf>.

agreement does not follow the outlines of the initial agenda. Moreover, the withdrawal of Dutch Deltares, one of the two companies conducting the TESIA, because of insufficient guarantees surrounding the transparency of the study, appears ominous.<sup>47</sup>

This also illustrates how laborious the back-and-forth exchanges have been between Egypt and Ethiopia surrounding the GERD's development, despite the intention to carry this project forward within a regional context. Significantly, despite the difficulties encountered by the Ethiopian government in reaching an agreement with Egypt, it remains determined to look at energy as a viable export commodity and to consider its neighbours as a reliable market.

## CONCLUSION

Unveiling the GERD project has inspired Ethiopia to break away from past practices in regional diplomatic security.<sup>48</sup> While considering how to become a regional powerhouse, it has taken a step towards addressing the country's energy access challenges while fostering regional development.

Despite being a regional energy market in its infancy, Ethiopia is rapidly gaining a strategic position as the primary producer of electrical power derived from hydro. With increasing leverage in regional institutions such as IGAD and the EAPP, and the opening of an inter-regional market through the TFTA between COMESA, the EAC and SADC, Ethiopia's national and regional ambitions could soon meet with success.

While the main dam is under construction, the GERD project's interconnection requires a level of investment beyond the structural capacity of Ethiopia, to include other EAPP members such as Djibouti, Egypt, Kenya and Sudan and, beyond them, continental and international investors. It is thus not surprising that Ethiopia, in collaboration with international donors and in topical partnerships with countries such as China for infrastructure construction, has developed an energy strategy that pays special attention to rapidly upgrading and building transmission lines, substations and interconnectors.

Nonetheless, Ethiopia must consider that, although the country is benefitting from one of the highest growth rates on the continent and is rapidly moving forward with the development of its national energy sector, neighbouring countries have not yet developed or implemented comprehensive energy policies or strategies. This raises the question of whether regional integration can be realised in a context where a greater regional commitment to anything beyond national priorities is still a long time coming.

47 See The Ethiopia Observatory, 'Deltares withdraws from commissioned studies of Ethiopia's dam: Could this mire GERD in further difficulties?', 11 September 2015, <http://ethiopiaobservatory.com/2015/09/11/deltares-withdraws-from-commissioned-studies-of-ethiopia-s-dam-could-this-mire-gerd-in-further-difficulties/>.

48 Maru MT, 'Ethiopia's Regional Diplomacies: a Dominant Interpretation of the Horn of Africa', SAIIA Policy Briefing, 112, 2014, [http://www.saiia.org.za/doc\\_view/600-ethiopia-s-regional-diplomacies-a-dominant-interpretation-of-the-horn-of-africa](http://www.saiia.org.za/doc_view/600-ethiopia-s-regional-diplomacies-a-dominant-interpretation-of-the-horn-of-africa).

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