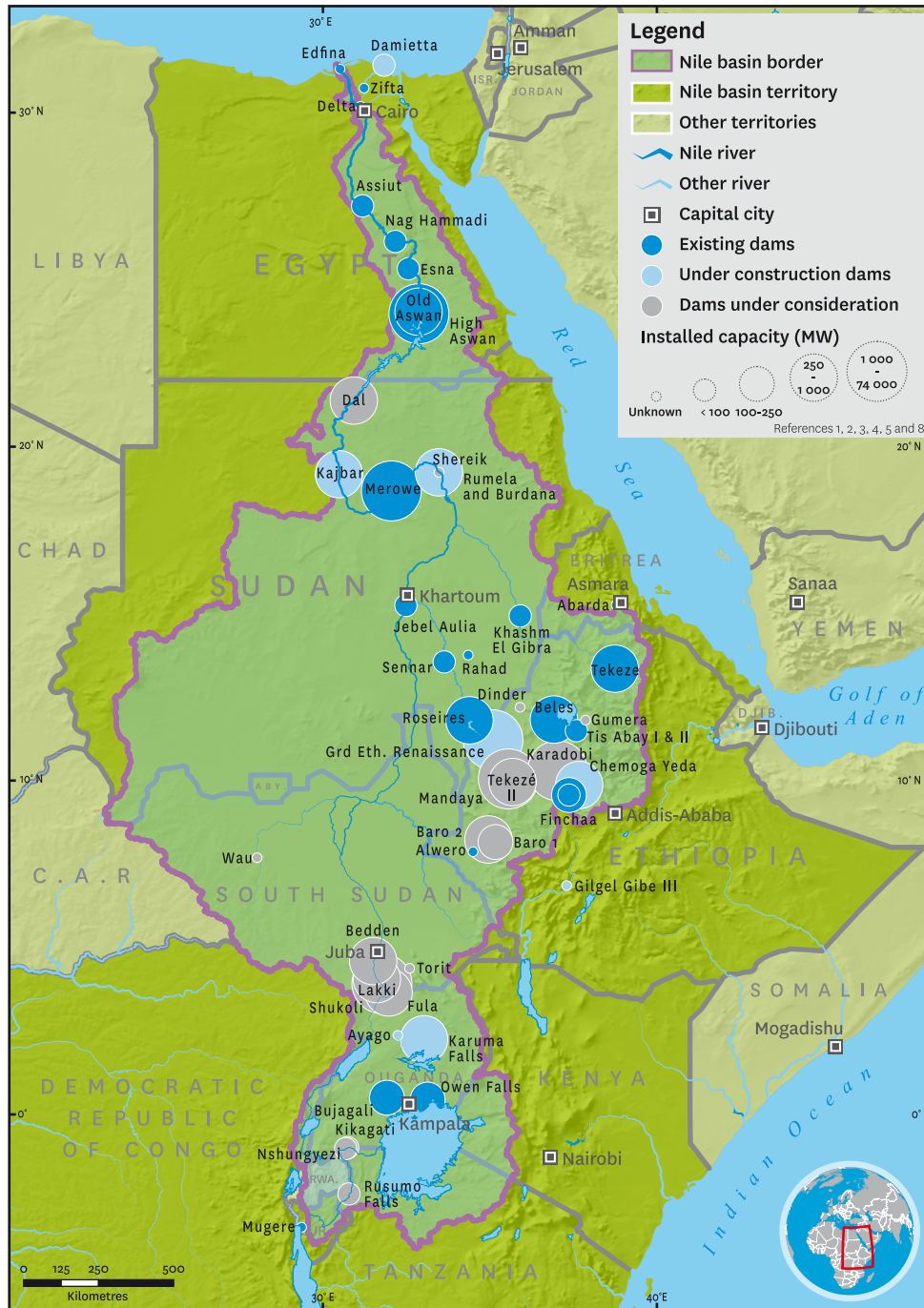


# Hydropower Along the Nile

**Foreword:**

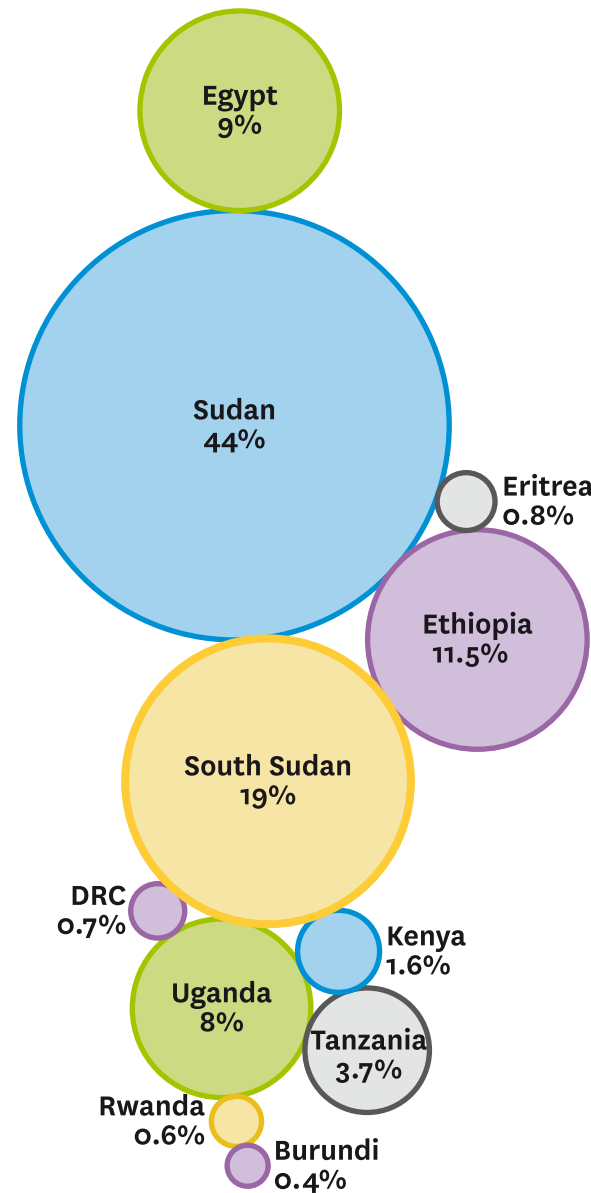
The following visuals highlight and help to better understand the hydropower expansion along the Nile River. The main factors explaining such development in the sector are: 1) Riparian countries lack access to grid electricity although demand is increasing with rising economies and population; 2) High hydropower potential with few existing infrastructure; 3) The Nile Basin Initiative (NBI) contributes to hydropower expansion by providing a forum for joint planning and cooperative development; 4) Availability of new funding sources from emerging powers (e.g. China, Turkey or Arab States).

**Dam Diversity**



**Fragmentation of Nile basin area between 11 riparian states<sup>15</sup>**

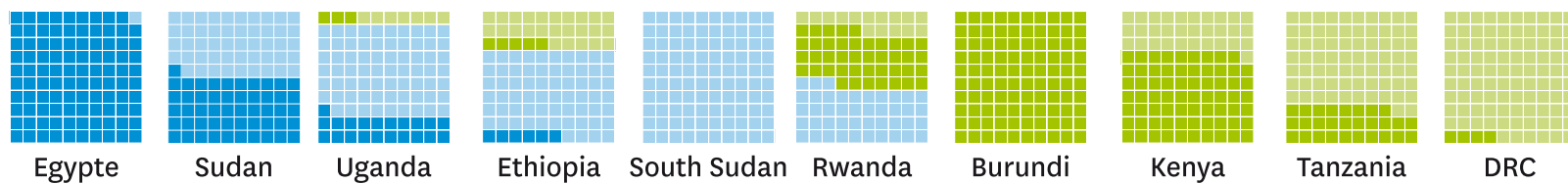
The Nile River is the longest river in the world (6 718 km), with an expanded basin area of 3,020,100 km<sup>2</sup>. Eleven riparian states share the extent of the basin according to the proportions below: the proportions reflect the share of the basin area in each country.



**Hydropower Capacity<sup>8,15</sup>**

- Operational, in basin
- Planned, in basin
- Operational, outside basin
- Planned, outside basin

The total hydropower capacity is symbolised by a "checkerboard", whether it's functional or planned, inside or outside the Nile basin. The countries are sorted by functional hydropower within and then without the basin. For example, Egypt has already developed close to its full hydroelectric capacity (99%), all of it within the Nile basin. Ethiopia has a great hydropower potential within the basin, but only 6% is functional. Outside the basin, the Democratic Republic of the Congo is a major actor of future dam development with the proposed of the Grand Inga dam project that has a potential capacity of about 40 MW (if completed, this dam would be the largest in the world).

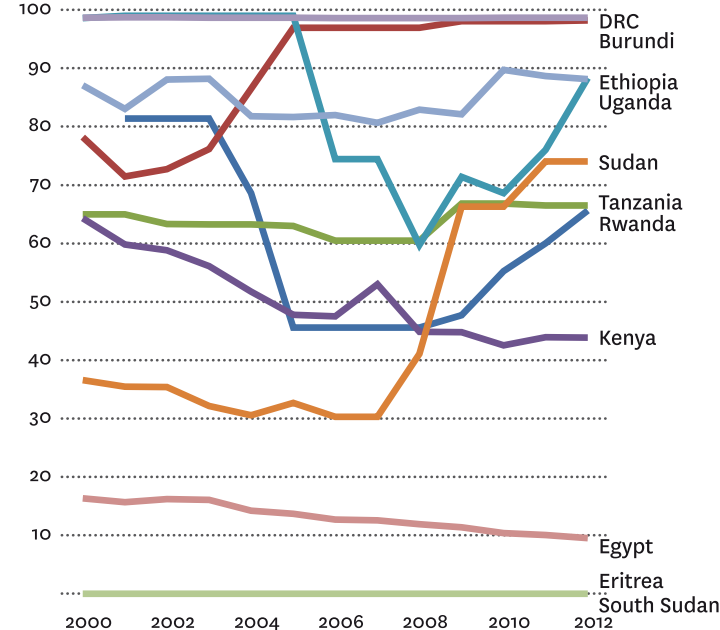


**Hydropower Importance**

**Hydropower Share<sup>10,15,17</sup>**

Hydropower plays an increasing role in most of Nile basin economies: it contributes to more than 80% of electricity in Burundi, Uganda, DRC and Ethiopia. This option is preferred for its long-economic life and the low production cost of electricity, making it affordable to the poor urban and rural areas. The average Levelized Cost of Electricity (LCOE) for large hydropower infrastructure in Africa is below 0.1 USD/kWh, well below the LCOE of gas, coal or geothermal. The use of hydropower also brings environmental benefits like: less deforestation and soil erosion from biomass burning, less green-house gas emission from fossil fuel, better flood control and river-flow regulation.

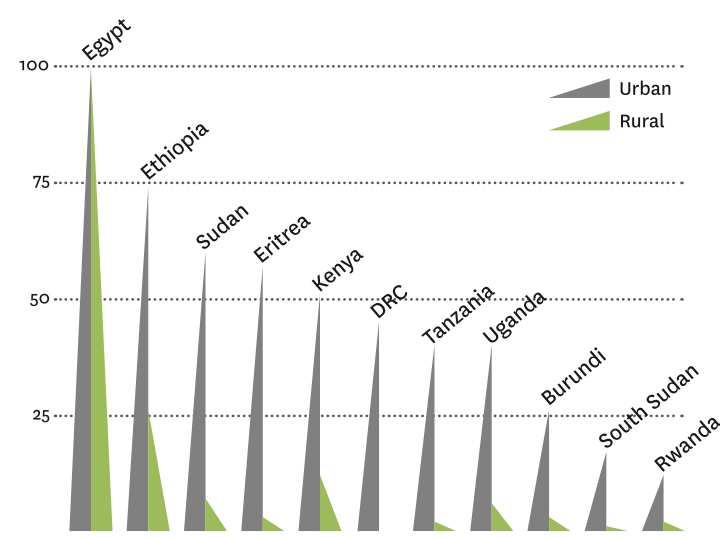
**Percentage of Hydropower in Total Electricity Installed Capacity**



**Electrical Grid<sup>15</sup>**

The Nile basin countries generally lack a harmonised electrical grid, an interconnected network to deliver electricity to consumers, especially in rural areas, as shown in the graphic below for the year 2010.

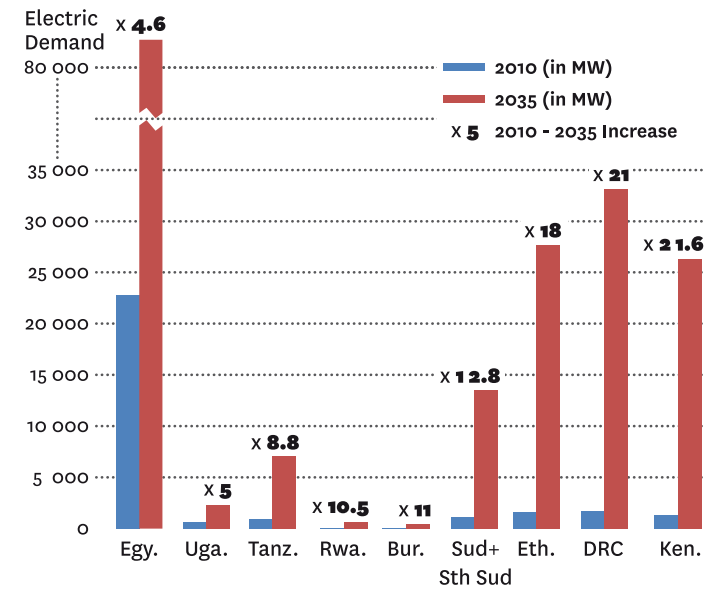
**Percentage of Population with Grid Electricity (2010)**



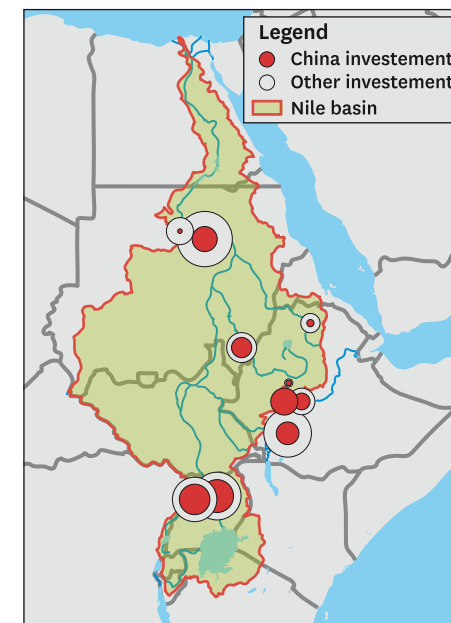
**Hydropower Potential<sup>15,16</sup>**

The same countries can however benefit from a high hydropower potential awaiting infrastructure development. Therefore an increased demand is forecasted as shown in the figure below.

**Peak Demand Forecast (2010-2035)**



**Hydropower Investment<sup>1-8,10-14</sup>**



Since 1999, the People's Republic of China has launched policies to encourage national companies as well as banks, to engage in dam building overseas. This is particularly the case for the state-owned SinoHydro Corporation that is now the largest hydropower company in the world or the Export-Import Bank (China Exim Bank) that has become one of the major funder of large dams. According to the NGO "International Rivers", in August 2012 the country invested in 85 dams in Africa, representing 28% of all Chinese overseas dams investments. China's first involvement in the Nile river Basin was in 2003 at the Merowe Dam in Sudan. In this case, other financing institutions had previously rejected to get involved due to non-compliance with social and environmental standards. This map shows the distribution and proportion of the main Chinese investments along the Nile.

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**Geospatial Sources** 1. UN Cartographic Section; 2. HydroSHEDS; 3. GRanD Dams Database V1.1; 4. OCHA; 5. Natural Earth  
**References** 6. AidData 2015 "Tracking Chinese Development Finance"; beta; 7. Dams Implementation Unit (DIU) 2015 "Merowe Dam Project"; 8. FAO Aquastat 2015 "Geo-referenced dams database"; 9. Gereselassie E. 2011 "Ameriti-Neshi to Start Generating 48.5 MW Next Week" Addis Fortune, Volume 12, Number 580; 10. Gielen D. 2012. "Power Sector Costing Study Update" Abu Dhabi 15 January 2012; International Renewable Energy Agency (IRENA); 11. International Business Publications 2012 "Sudan Investment and Business Guide" Volume 1, Strategic and Practical Information. Washington DC, USA-Sudan; 12. International Rivers 2010 and 2012, Berkeley; 13. "The New Great Walls: A Guide to China's Overseas Dam Industry. Second Edition, Berkeley; 14. Jacobs I. M. 2012 "The politics of water in Africa: norms, environmental regions and transboundary cooperation in the Orange-Senqu and Nile Rivers" A&C Black; 15. "State of the Nile River Basin" and Hydropower Potential and the Region's Rising Energy Demand" from the Nile Basin Initiative, 2012; 16. Strategic Foresight Group 2013. Blue Peace for the Nile, Mumbai, India; 17. U.S. Energy Information Administration 2015 "International Energy Statistics." <http://www.eia.doe.gov>  
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