West Africa: Pooling together for power

The West African Power Pool (WAPP) was conceived in 1999 when 14 out of 15 member governments of the West African regional bloc ECOWAS agreed to “pool” together the efforts of their respective national electricity companies. The goal is to create more robust regional power systems with the potential of lowering capital investment requirements, reducing system operational costs and ultimately increasing electricity supply and access across the region. More than a decade since its conception, the agreement has had a limited impact on electricity supply in the region and persistent challenges mean that the region’s aspiration to achieve energy security still hangs in the balance.

Living in the dark

Fossil fuels account for roughly 75% of power generation across Africa and West Africa holds a third of the continent’s proven fossil fuel reserves. Yet, over half of the population in the region lacks access to electricity. As of 2011, the total population of ECOWAS stood at about 300 million, representing nearly 40% of sub-Saharan Africa's population. The population growth rate, estimated at 2.65% per annum, is the highest in the world, meaning the number of people living in the region is expected rise to 320 million by 2015. This rapid population growth far outpaces the rate at which governments are able to meet their citizens’ energy needs.

Reliable and up-to-date data on the state of the electricity deficit are hard to come by but recent estimates put average access rates for the region at about 40%, roughly on par with the rest of the African continent, where access rates stand at about 42% (the global average is 80.5%). However, the figure masks stark disparities between countries. When disaggregated, the access rates range from as low as 15% in Burkina Faso and 28% in Togo and Benin, 50% in Nigeria and 61% in Ghana.

Estimates from 2010 show peak load (demand) for the region to be in excess of 7,500 megawatts (MW) but suppressed demand is anywhere between 40-50% of this figure. At around 139 kilowatt-hours (kWh), electricity consumption per capita in West Africa is among the lowest in the world, although this figure is still higher than Central Africa at 117 kWh and East Africa at a low 70 kWh. Southern Africa and North Africa lead the continent’s per capita consumption at 1,815 kWh and 1,019 kWh, respectively. Taking into account the regional drivers of electricity demand: economic growth,
population growth, increased access to electricity and improved satisfaction of suppressed demand, electricity demand in West Africa is expected to grow at a rate of about 7% annually.

Planning for success?

The ECOWAS Energy Plan was established under the WAPP agreement in 1999 and later revised in 2004 (the Master Plan). The plan envisages a maximum demand of almost 22,500 MW for the target year 2020. We believe this figure is a very modest estimate. Nigeria alone, which consumes about two thirds of energy in the region, has a current estimated national demand of 10,000-12,000 MW - a figure also likely to be on the conservative side given the country’s rapid growth.

So far WAPP has had mixed success. As of 2010 the total installed capacity was estimated at 14,091 MW but available capacity was slightly below 8,900 MW. If demand is expected to reach 22,500 MW or more in the next seven years, it is clear that WAPP’s plan are falling behind. Indeed, a June 2012 WAPP update on the status of its projects shows that only an additional 1,800-2,300 MW was being planned as part of the five subprograms and two additional projects under the WAPP Strategic Generation Subprogram (the Emergency Power Supply Security Plan). Furthermore, out of the 23 generation and transmission projects planned under the subprogram, only two had been completed. 10 projects are at various stages of implementation while the remaining 11 are still awaiting financing, mostly for pre-feasibility or pre-investment studies.
Re-strategising

Despite efforts to date, the demand growth rate has continued to outpace the speed at which plans are being developed. Consequently, nearly all member states have resorted to developing their own emergency projects. While their action is not entirely unreasonable, these domestic plans are too often driven by political considerations rather than careful planning. They tend to be overly ambitious and unrealistic. For example, taking into account that Sierra Leone’s current installed generation capacity is about 100 MW with actual generation at 75 MW, President Bai Koroma’s pledge to increase capacity to 1000 MW by 2017 is completely impractical: a pledge made as part of an election promise rather than practical planning.

The WAPP Master Plan was revised again in 2012 and identified 36 projects as priorities. The plan now has much greater emphasis on generation projects than transmission due to the realisation that progress had previously been hampered by the inability to match the commissioning of transmission projects with the commissioning of adequate generation. The cost of the priority projects is estimated at about US$26.4bn, with generation costs of roughly US$18bn and transmission costs of approximately US$6bn. These projects will include the development of 16,000km of transmission lines, 7,092 MW of hydropower and 800 MW of renewable energy projects to be executed in three phases over the period 2012 to 2025.

What next

Success of the new plan will depend on WAPP’s ability to address the following major outstanding issues:

- Undiversified energy mix

The region’s reliance on gas-fired power generation means that Nigeria, with its enormous proven natural gas reserves of 182 trillion cubic feet, remains the dominant gas supplier via the West African Gas Pipeline (WAGP). This poses major risks for the region’s energy security. The 2012 revised Master Plan expressed support for Nigeria’s current plans to develop additional thermal generation through its major privatisation program of virtually all parts of the sector except transmission. It is expected that this will increase domestic generation, which will ultimately mean an overall increase in regional generation.

Ironically, this development could undermine WAPP’s plans as the political importance of the Nigeria’s privatisation means that the government will be very hesitant in the short to medium term to commit to exporting power - or gas - to the rest of the region at a time when the country needs it most.

The inability to access sufficient quantities of gas has already delayed the commissioning of key projects, including Benin’s 450 MW Maria Gleta power plant and Ghana’s 682 MW Takoradi thermal plant. Consequently, ECOWAS will need to step up efforts to diversify its energy mix if it is to guarantee energy security.

In addition, the secondary reliance on hydro-power exposes regional power supply levels to seasonal fluctuations and unexpected weather patterns. Low levels of water in the hydro stations at times coincide with the gas disruptions, resulting in major blackouts.
Longer term alternatives such as importing liquefied natural gas (LNG) or modern biomass applications will need to be seriously considered. Similarly, the region will have to be more aggressive in its pursuit of renewable energy; it has so far been one of the least proactive in Africa on the issue.

- Attracting private sector funding

Developing appropriate policies and financing mechanisms for cross-border projects is another major challenge, critical to encouraging private sector investment. The problem is further exacerbated by poor planning and poor maintenance standards on existing facilities.

WAPP is currently working with the World Bank and other financiers to develop workable models for cross-border project finance and the regulation on priority projects, along with ways to increase the capacity of institutions responsible to support delivery but these developments will take time to be realised. Indeed, we expect private sector involvement to be largely limited to domestic projects in the medium term. This will help increase individual countries’ power supply, with associated benefits for the region in the long term. However, until domestic generation reaches satisfactory levels, member governments are likely to be less committed to exporting power.

Meanwhile, attracting private sector funding for domestic projects will depend on governments’ ability to minimise risks in the sector and to provide sovereign guarantees. State utilities also need to recover their costs and meaning that tariffs need to be adjusted to be market-reflective rather than heavily subsidised. Only by doing so can they generate sufficient funds for new investments and maintenance of existing infrastructure. With regards to transmission in particular, initial government funding may be necessary and a better way of using government funds to catalyse future private sector investments than price subsidies.

- Establishing a regional electricity market

One of the challenges that could arise as power generation becomes better and interconnection projects are completed is that of establishing a genuine electricity market where producers are able to export energy on a competitive basis or sell to a regional power exchange, and where distribution companies and high-volume consumers are able to import energy on a competitive basis or buy from a regional power exchange.

At present, there is no competition among buyers and sellers in cross-border exchanges. The development and empowerment of a regional transmission company will be critical to getting this right. This body’s task, amongst other things should be to ensure that each market participant gets access to the whole WAPP regional network by paying only one transmission tariff; hence, eliminating transit tariffs and export tariffs.