



## The Millennium Challenge Account-Malawi

### MCA-Malawi COMPACT ACTIVITIES & BENEFITS The Abridged Version

#### Project Goal

Millennium Challenge Compact aims to reduce poverty through economic growth in Malawi.

#### Project Cost

\$350.7million

#### Program Objective

The collective Program Objective is to (i) reduce the cost of doing business in Malawi, (ii) expand access to electricity for the Malawian people and businesses, and (iii) increase value-added production in Malawi.

#### Project Objectives

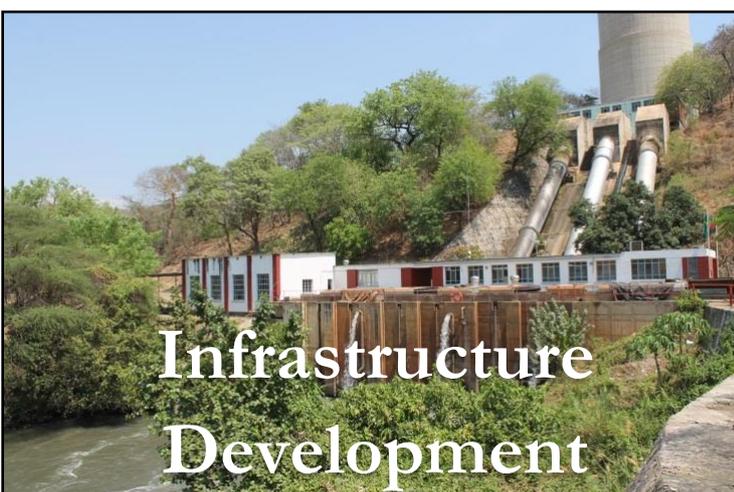
The collective Project Objectives are:

(i) To improve the availability, reliability, and quality of the power supply by increasing the throughput capacity and stability of the national electricity grid and increasing efficiency of hydropower generation through investment in **Infrastructure Development Project**.

(ii) To create an enabling environment for future expansion of the power sector by strengthening sector institutions and enhancing regulation and governance of the sector through investment in the **Power Sector Reform Project**.

(iii) To mitigate the growing problems of aquatic weed infestation and excessive sedimentation in the Shire River Basin to reduce the costly disruptions to Malawi's hydropower generation through investment in **Environmental and Natural Resource Management Project**.

## A. THE PROJECTS



### 1. Infrastructure Development

The Infrastructure Development Project will rehabilitate, upgrade and modernize ESCOM's generation, transmission and distribution assets in most urgent need of repair, in order to preserve existing generation, improve the capability of the transmission system, and increase the efficiency and sustainability of hydropower generation.

To facilitate the development and implementation of the Program, MCC is providing support for the Government's ability to identify and prioritize investments in the sector by developing an integrated resource plan. MCC Funding will support significant investments in the power system infrastructure to preserve generation, stabilize and modernize the transmission and distribution network.

The Infrastructure Development Activity is only viable, technically and economically, if the Government and ESCOM maintain current generation assets and expand the generation capacity of the power system. Under the Infrastructure Development Activity, the Government will invest in the existing generation by rehabilitating the Nkula A hydro power station .

Additionally, the Government will continue to seek to attract sustainable investment from the private sector and other donors to add significant amounts of new generation to the system. It is expected that by the end of the Compact Term, the Infrastructure Development Activity, together with the Government's commitment to complete construction of Kapichira II, will result in increases in generation capacity (from 286 MW to approximately 356 MW), network throughput capacity (from 260 MW to approximately 410 MW) and distribution capacity (from 868 MVA to approximately 1,078 MVA), and a reduction of total system losses from 20-25% to 18%.

### **Sub-Activities under the Infrastructure Development Project**

**(i) Nkula A Refurbishment Sub-Activity:** Compact Funding will support the refurbishment of the Nkula A hydropower plant, with the objective of improving the availability of power in Malawi by reducing outages caused by the condition of the assets, and maximizing power output from Nkula A. The refurbishment will improve the reliability of the plant, extend its useful life, and thereby avoid a partial or total failure of the plant.



**Old machinery at Nkula A will be replaced, refurbished and modernised.**

**(ii) Transmission Network Upgrade Sub-Activity:** This is designed to upgrade the backbone of Malawi's transmission network to:

- improve the quality and reliability of supply in the northern, central, and southern regions of the country;
- increase the capacity to move power from the south, where 98% of Malawi's power is currently generated, to the central and northern regions;
- reduce technical losses on transmission lines; and,
- provide a secure transmission link between the southern and central regions.



**The project will invest in construction of new substations, and rehabilitation of old ones.**

### **MCC Funding will support the following investments under this Sub-Activity:**

- the 400 kV power line (the transmission "backbone" of the Malawi power system) from Phombeya to Lilongwe, which covers the southern and central regions of Malawi; and,
- the 132kV line parallel to existing 66kV and 33kV lines from Chintheche to Luwinga and from Luwinga to Bwengu in the northern region.

**(iii) Transmission and Distribution Upgrade, Expansion, and Rehabilitation Sub-Activity:**

These investments will enhance Malawi’s power network. MCC Funding will support the following measures:

- upgrading (up-rating) of existing network connections (33kV, 11kV);
- extension of existing substations (including 66kV);
- up-rating of transformers in existing substations;
- development of new substations;
- installation of improved protection systems;
- provision of new network extensions and connections; and
- installation of new controls and communication systems (SCADA).

## 2. Power Sector Reform

The Power Sector Reform Project complements the Infrastructure Development Project by providing support for the Government’s policy reform agenda and building capacity in pivotal sector institutions: ESCOM, the Malawi Energy Regulatory Authority (“MERA”), and the Ministry of Energy (“MoE”). The Power Sector Reform Project consists of two activities: the ESCOM Turnaround Activity and the Regulatory Strengthening Activity.



**(i) ESCOM Turnaround:** The objectives are to restore ESCOM’s financial health and rebuild the organisation into a financially sustainable, well-managed utility company. MCC Funding will support three main areas of the turnaround:

*a) Finances*

MCC Funding will support the provision of technical assistance and equipment to ESCOM, including: (1) development of a detailed financial plan for ESCOM fiscal years 2013-2018; and (2) development of a comprehensive management information system that includes a new automated financial management system and fixed asset mapping

*b) Corporate governance and*

To improve corporate governance and support the turnaround, MCC Funding may support: (1) recruitment services for key personnel; (2) twinning/mentoring arrangements or management contract support; (3) a performance management system; and (4) strategic planning by the board of directors of ESCOM (“ESCOM Board”). MCC funding will provide technical assistance on corporate performance standards, including a study on best practices and benchmarks for corporate governance of electric utilities with regional, continental and international benchmarks and recommendations for ESCOM no later than the end of the second year of the Compact Term (the “Corporate Governance Benchmarking Study”).

*c) Operations*

MCC Funding will support change management efforts, including developing an organizational design, conducting performance management reviews, and designing human resources strategies. MCC Funding will support the procurement division by strengthening the internal control environment and developing policies and procedures to implement best practices in procurement. MCC Funding will

support other operational assistance, including (1) deployment of a financial turnaround team; (2) development of a non-technical loss reduction study; (3) assistance in rapid billings and collections improvements; 4) strengthening of internal controls; 5) rebuilding of the customer database; (6) pursuit of debt collection; (7) development of a new automated financial management system; (8) assistance with tariff applications to the regulator; and (9) assistance with fixed asset mapping. MCC Funding will also support the development of ESCOM's annual maintenance plan.

**(ii) *Regulatory Strengthening Sub-Activity.*** This activity complements the Infrastructure Development Activity and the ESCOM Turnaround Activity by providing support for the Government's policy reform agenda and building capacity of MERA and Ministry of Energy. The objectives are to develop a regulatory environment, consistent with best practices in independent power utility regulation, that support investment in generation and grid capacity at an affordable cost, with the potential participation of the private sector. MCC Project will fund four areas under Regulatory Strengthening:

a) *Tariff Reform.*

MCC funding will support tariff, regulatory, and energy policy support toward this end. MCC Funding will support a cost of service analysis to determine appropriate tariff levels and schedules to achieve full cost recovery, more efficient utilization of electricity, and achievement of social objectives. Based on the results of this analysis, the Government agrees to a phased implementation of full-cost recovery tariffs and schedules according to a timeline to be determined by entry into force of the Compact. Without reducing current tariff levels, the phased implementation will ensure an incremental increase in the scope of tariff levels and schedules, that will begin with a tariff that permits recovery of operating costs, thereafter recovery of operating costs plus capital replacement charges, and by the end of the Compact Term recovery of capital replacement costs, capital replacement charges and capital expansion charges. This full-cost recovery tariff should include recovery of operating expenses, financing costs actually incurred by ESCOM, capital replacement charges and capital expansion charges so that tariffs reflect ESCOM's long-run marginal costs. *The Government will also seek to ensure adequate protection of poor and vulnerable groups through a lifeline tariff or other mechanism in a manner which is consistent with average total cost recovery and efficient utilization of electricity.*

b) *MERA Capacity Building.*

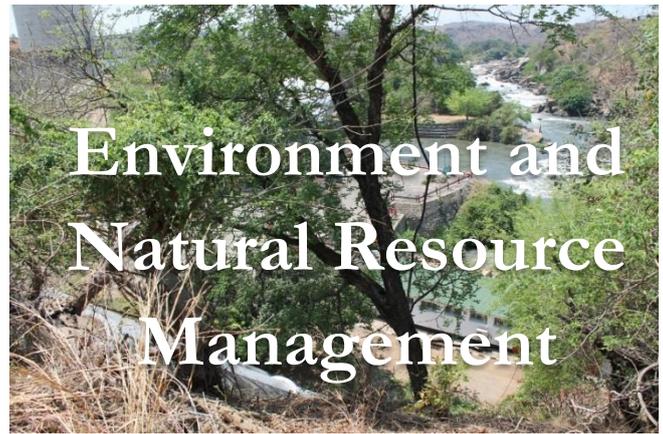
MCC Funding will support capacity building at MERA to improve its regulatory oversight activities and operations. This work will include the development and implementation of training and mentoring of MERA staff, and complementary activities designed to develop MERA. MCC Funding will also assist MERA to develop peer relationships with other regulatory bodies or related organizations. The Government will ensure that the scope of MERA's power sector responsibilities is limited to regulation and policy implementation, and not for policy development or the solicitation of new generation.

c) *Enabling Environment for Public and Private Sector Investment.*

MCC Funding will support the Government's efforts and capacity to implement a suitable market model based on the studies performed in connection with the development of this Compact. MCC Funding will support training and capacity building at MoE as well as its efforts to study and design (1) a restructured model for the power sector ("Restructuring Plan"); and (2) the building blocks of a bilateral power trade market. MCC Funding will also assist with stakeholder education and outreach to support consumer organizations, industrial and commercial users, and other key players in advocating for improved service.

### 3. Environment and Natural Resource Management (“ENRM”) Project:

The Environment and Natural Resource Management (“ENRM”) Project is intended to help the Government and other relevant stakeholders address the growing problems of aquatic weed infestation and excessive sedimentation in the Shire River which cause costly disruptions to downstream power plant operations. The ENRM Project is also expected to improve land use and watershed management practices in the Shire River basin by addressing underlying environmental and social issues.



#### ***MCC Funding will support the following investments under this project:***

- i. Mitigation of the impact of the weeds and sedimentation through mechanical and biological measures in accordance with international best practices,
- ii. purchasing and use of dredgers, trash rakes, diversion booms, conveyers, disposal trucks and weed-harvesting equipment at existing hydropower plants and the Liwonde Barrage as well as identification of environmentally-appropriate disposals sites, and
- iii. expand the use of upstream biological control measures (“Weed and Sediment Management Activity”).

Development and implementation of an integrated set of activities, acceptable to MCC, aimed at improving environmental and natural resources management (ENRM) in the Shire River Basin. These activities will be based on analysis of the environmental, social (including gender) and economic factors that cause or contribute to weed infestation and sedimentation in the Shire River. Project activities will target the drivers of land-use degradation in the Shire River Basin, and will be implemented in collaboration with other donors and stakeholders.

ENRM project activities will decrease outages and increase electricity output at the Nkula, Tedzani, and Kapichira hydropower plants that are currently affected by invasive weeds and excessive sedimentation. The project activities are also expected to improve land use and watershed management practices in the Shire River basin to help resolve underlying environmental and social issues that affect hydropower, communities, and other users dependent on ecosystem services (“ENRM Activity”).

#### ***MCC Funding will support the following measures under the ENRM Sub-Activity:***

- i. Weed and Sediment Management: Mitigation of the impact of the weeds and sedimentation through mechanical means in accordance with international best practices, including the purchase and use of dredgers and weed-harvesting equipment at existing hydropower plants at the Liwonde Barrage.

- ii. Development and implementation of an Environmental and Natural Resource Management Action Plan (“ENRMAP”), that enables an improved understanding of the environmental, social (including gender), and economic factors that cause or contribute to weed infestation and sedimentation in the Shire River, and establishes a set of prioritized interventions based on economic, institutional, policy, legal, environmental and social



**The project will mitigate the impact of sediments to improve the efficiency of the power stations.**

criteria to increase capacity to address these factors, in collaboration with other donors and stakeholders. This Sub-Activity will also include the promotion of the use of biological control measures in order to suppress weeds.

- iii. **Gender and Social Integration:** The Malawi Compact seeks to successfully integrate social and gender components into all Compact activities, as well as through a \$2M dedicated gender integration activity. Overarching interventions will include reviewing the Energy Policy through a gender lens, supporting the resettlement process, and seeking to promote women's employment in construction projects.

At the Project or Activity level, social and gender activities that will comprise part of the Power Sector Reform Project (PSRP) include integrating gender in tariff reform, and capacity building for ESCOM, MERA and the Ministry of Energy. Within the Environmental and Natural Resource Management (ENRM) Activity, social and gender activities will include engendering the Trust Fund. Additionally, with the \$2M gender budget, there will be a specific set of gender integration activities focused on supporting conservation agriculture projects for women's community-based organizations and other women's groups in the Middle and Upper Shire River Basins.

#### 4. Cross-Cutting Support

The Compact also contains funding for cross-cutting activities that support the implementation of the Power Sector Revitalization Project, namely Monitoring & Evaluation and Gender and Social Integration.

- i. **Monitoring and Evaluation:** MCC and the Government will formulate and agree to an M&E Plan that specifies:
  - a) how progress toward the Compact Goal, Program Objective and Project Objective will be monitored
  - b) a process and timeline for the monitoring of planned, on-going, or completed activities to determine their efficiency and effectiveness; and
  - c) a methodology for assessment and rigorous evaluation of the outcomes and impact of the Program. Information regarding the Program's performance, including the M&E Plan, and any amendments or modifications thereto, as well as progress and other reports, will be made publicly available on the website of MCC, MCA-Malawi and elsewhere.

### B. COMPACT BENEFITS

#### 1. Income Benefits

- i. The expected net present value of benefits are estimated to range from *US\$567.2 million* to *US\$832.0 million*
- ii. The estimated economic rate of return to range from *18.7%* to *24.6%* during the compact implementation period with the interconnector as the potential investment to come during the compact implementation period.

- iii. An estimated total of approximately 982,729 *individuals* (without interconnector) to 988,915 *individuals* (with interconnector) are expected to benefit from the MCC investments by year 20 after Compact term as a result of increased consumption of electricity.
- iv. The magnitude of private benefits increase from US\$577 to US\$841 per beneficiary with corresponding estimated benefit-cost ratio (cost effectiveness) of 1.70 to 2.27.

## **2. Technical Benefits**

- i. The investments in the transmission and distribution (T&D) backbone are expected to increase network throughput capacity from 260 MW to 960 MW.
- ii. Transmission capacity will increase from 991.5 MVA to approximately 1,661.5 MVA.
- iii. Distribution capacity will increase from 868 MVA to approximately 942 MVA.
- iv. The T&D investments through the Compact are expected to reduce system losses by 5% from an average of 22-25% to 18% by end of year five of Compact implementation.
- v. Additional capacity of up to a maximum of 3-6 MW from the refurbishment of Nkula A will be added to the existing installed generation capacity.
- vi. Improved load factors for installed generation capacity (58%-78%) from weed and sediment management investments that are expected to improve efficiency and water flow of hydropower stations along the Shire River (Nkula A and B; Tedzani I, II, and III; and Kapichira I and II).

## **3. Reform Benefits**

- i. Improved power sector governance, operations and service.
- ii. Improved financial performance of the power sector.
- iii. Reduced real and perceived risks in the sector.
- iv. Increased availability of Malawi to participate in regional institutions – South Africa Power Development (SAPD), Southern Africa Power Pool (SAPP), Regional Energy Regulatory Authority (RERA), and African Forum for Utility Regulators (AFUR).
- v. Increased ability for ESCOM to participate in regional power trade.
- vi. Increased potential for private sector participation and investment in power generation, transmission and distribution.

**Read the detailed MCA-Malawi Compact and other MCA-Malawi related documents on:**

<http://www.mca-m.gov.mw/>