ANNEX

Action Document for the Kariba Dam Rehabilitation Project

1. IDENTIFICATION

<table>
<thead>
<tr>
<th>Title/Number</th>
<th>Kariba Dam Rehabilitation Project</th>
</tr>
</thead>
<tbody>
<tr>
<td>CRIS number</td>
<td>FED/2014/031-570</td>
</tr>
</tbody>
</table>

| Total cost | Total estimated cost: EUR 217 700 000 |
|           | Total amount of EDF contribution: EUR 74 000 000 |
|           | EUR 64 000 000 under the Bridging Facility |
|           | EUR 10 000 000 to be provided at a later stage, subject to an amendment to the current financing decision |
|           | This action is co-financed in parallel co-financing by: |
|           | - World Bank for an amount of USD 75 000 000 |
|           | - African Development Bank (AfDB) for an amount of USD 75 000 000 |
|           | - Swedish International Development Cooperation Agency (SIDA) for an amount of USD 25 000 000 |
|           | - Zambezi River Authority for an amount of USD 19 200 000 |

<table>
<thead>
<tr>
<th>Aid method / Management mode and type of financing</th>
<th>Project Approach</th>
</tr>
</thead>
<tbody>
<tr>
<td>DAC-code</td>
<td>23065</td>
</tr>
<tr>
<td>Sector</td>
<td>Energy generation and supply</td>
</tr>
</tbody>
</table>

2. RATIONALE AND CONTEXT

2.1. Summary of the action and its objectives

The overall objective of this project is to increase the reliability of supply of clean energy to Zambia and Zimbabwe, and to minimize the hydropower risks (dam failure) to population in the vicinity of the Kariba hydropower plant (estimated 392,720 people affected). To do so, the purpose of the project is to support the Zambezi River Authority in carrying out the Kariba hydropower plant safety rehabilitation. The result will be the stabilization of the plunge pool downstream of the dam wall and the full operability of the spillway system. Consequently, the installed generation capacity of 1,830MW will be retained in the long term while the risk to communities will be downgraded.

The project will be co-financed in parallel co-financing with the African Development Bank, the Embassy of Sweden to Zambia, the World Bank and the Zambezi River Authority. The project has two distinct separate rehabilitation...
components: (i) Plunge Pool Reshaping, and (ii) Refurbishment of the Spillway. Each component will be funded by different co-financing partners. The EDF funds will be earmarked for the Plunge Pool Refurbishing. The African Development Bank, the Embassy of Sweden to Zambia and the World Bank will support the refurbishment of the spillway. The funds from the Zambezi River Authority will go to the institutional project support.

The feasibility study and detailed design\(^1\) commissioned by the Zambezi River Authority was completed in June 2012. A review (second opinion) of the design proposals for stabilisation of the Kariba Dam plunge pool and rehabilitation of the spillway up-stream hydro mechanical facility and associated civil works was conducted in 2012 by an independent panel of experts. The final review report submitted in November 2012 confirmed the design as being the optimal solution.

The request for European Union financing of the rehabilitation of the Kariba Dam was received from the Ministry of Finance (Zambia) and the Ministry of Finance (Zimbabwe) on the 12\(^{th}\) of February 2014.

2.2. **Context**

2.2.1. **Regional context**

2.2.1.1. Economic and social situation and poverty analysis

The southern African region has experienced sustained economic growth and increasing prosperity over the past decade. The annual rate of GDP growth in 2011 averaged around 5.14%, with GDP for the region estimated at around US$575.5 billion. This has been largely driven by increasing demand for natural resource based commodities facilitated by increased peace and stability. With the population of the Southern African Development Community (SADC) region expected to more than double from around 280 million people in 2012 to more than 560 million over the next 30 years, and as the SADC region industrializes on its path to improved human development, the demand for power is likely to increase by 40 percent over the next decade. As a result, the electricity sector is seen as central to catalysing infrastructure projects that drive both regional integration and economic growth, with energy security increasingly important to continued development across southern Africa.

2.2.1.2. Regional development policy

Recognizing the importance of the energy sector to regional growth prospects, the SADC has developed and implemented a comprehensive framework to facilitate integration. Energy plays a central role in this ambitious agenda through the Southern African Power Pool (SAPP). The SAPP was established in 1995 to provide a forum for regional solutions to electricity generation and provides for coordinated planning and operation of the regional power system. The current operations of the SAPP build on a concerted effort to establish a regional framework for energy security based on several regional strategic plans for energy development. These include the SADC Energy Cooperation Policy and Strategy in 1996, followed by the SADC Energy Action Plan in 1997 and the SADC Energy Activity Plan in 2000. Most recently, the Regional Infrastructure Development Master Plan and its Energy Sector Plan in 2012 have been adopted by the SADC Member States. Furthermore this

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\(^1\) Tractebel Engineering and Coyne et Bellier in collaboration with SPRETEC
project is aligned with the Regional Integration Strategic Plans, the Zambia Country Strategy Paper and the Zimbabwe Flagship Report. These development strategies set out specific objectives for infrastructure development in energy and its subsectors, with the Energy Sector Plan and Regional Infrastructure Development Master Plan defining the regional infrastructure requirements and conditions to facilitate the realization of key infrastructure by 2027.

2.2.2. Sector context: policies and challenges

The long-term growth prospects and security of the SAPP are heavily dependent upon availability of the hydropower resources of the Zambezi River basin (ZRB). Hydropower remains an important but under-represented contributor to the SAPP, accounting for 17% (9,474 MW) of the overall generation capacity. The Zambezi River basin accounts for roughly 50% of this, with close to 5,000 MW of installed capacity and a similar amount planned for further development. In addition to the provision of firm energy, the centrality of the Zambezi River basin within the SAPP means that the hydropower schemes provide an important balancing element in the overall regional energy mix. Securing these resources is therefore critical to ensuring regional energy security and stability, and avoiding the regional blackouts that have undermined growth prospects in recent years as demand exceeds supply.

The peak demand of the SAPP was 45,315 MW in 2012 against an available capacity of 49,877 MW. Considering a 10.2% reserve requirement this is equivalent to a 173 MW shortfall for the interconnected system and 60 MW for the southern African region. Aging infrastructure, decommissioning of some plants and limited investments in new generation has reduced the available capacity leading to a regional supply deficit between 2007 and 2012/13 manifesting through rolling regional blackouts. In Zimbabwe, energy demand is estimated at over 2,000 MW with installed generation capacity approximately 1,960MW, of which only around 1,200MW is presently available for production. The result is a significant supply/demand gap of around 700MW, rising to 1,000MW during the winter season. There is also extensive suppressed energy demand that further dampens recovery and growth. In Zambia, demand is projected to increase from 1,600 MW in 2010 to about 2,400 MW in 2020. Investment needs in generation alone to provide required supply are estimated to be about US$6 billion in the next 10 years.

2.2.2.1. Kariba Dam

The Kariba Dam and Hydro-Electric Scheme, constructed across the Zambezi River between 1956 and 1959, is the second largest hydro-electric scheme in the Zambezi River Basin after the Cahora Bassa complex situated downstream in Mozambique. It is a double curvature concrete arch dam (128 m tall, crest length of 617 m) with a reservoir capacity of 181 km3, one of the largest in the world.

The owners of the Kariba dam are the Governments of Zambia and Zimbabwe. The dam is operated by the Zambezi River Authority (ZRA) which was established as a corporate body through parallel legislation in the parliaments of Zambia and Zimbabwe on the 1st of October 1987. The mandate given was to contribute to the economic, industrial and social development of the Republics of Zambia and Zimbabwe through: (i) obtaining the greatest possible benefit from the natural advantages offered by the waters of the Zambezi River; and (ii) improving and intensifying the utilisation of the waters for the production of hydropower and for any other purpose beneficial to the two countries. The ZRA strategic functional objectives include to: (i) operate, monitor and maintain the Kariba Dam and any
future dams on the Zambezi River; and (ii) manage the Kariba reservoir (Lake Kariba) and future dam reservoirs for hydropower generation taking cognisance of effects of operations to areas downstream.

The ZRA is financially autonomous. It gets its income from water tariffs for water used in the generation of power from the Zambia Electricity Supply Corporation (ZESCO) and the Zimbabwe Power Company (ZPC). The formula for payments from the two electricity utilities ZESCO and ZPC to the ZRA is to give sufficient funds to carry out its mandate functions and not to generate any profit.

The Kariba Dam has been central to energy security and economic development in both Zambia and Zimbabwe, and has an important role in ensuring the stability of the SAPP and in regulating flows on the Zambezi River. The reservoir supplies water to two hydropower stations located on the North bank in Zambia (1,080 MW operated by ZESCO) and on the South bank in Zimbabwe (720 MW operated by ZPC).

After 50 years of operation, the Kariba Dam now requires a series of rehabilitation works for its continued safe operation. Given the large the reservoir capacity (181 km³) a dam failure would have major impacts downstream in the Zambezi River. Such an event would seriously affect the Cahora Bassa Dam, resulting in regional power shortages and major floodings of low lying areas in Mozambique and Malawi. Considering the loss of the Cahora Bassa hydropower plant, this would result in a total loss of close to 40% of the SAPP installed generation capacity outside of South Africa.

A failure to invest in the timely rehabilitation of the dam will result in the gradual degradation of key safety features associated with the structure to a level that is not acceptable in accordance to international standards. The planned rehabilitation works include:

- Refurbishment and upgrading of the spillway system:
  - to prevent uncontrolled loss of water in the event of floodgate failure, which would result in water levels dropping below the minimum operating levels and interrupting power production;
  - to prevent failure during operation of stop-beams, which would result in an impossibility to maintain the floodgates;
- Reshaping of the plunge pool downstream of the dam to limit scouring and erosion that could potentially undermine the dam foundations, leading to dam failure.

2.3. Lessons learnt

The proposed rehabilitation works of the Kariba Dam requires exceptional measures which have never been implemented before. There are no existing dam rehabilitation projects to draw experience from. The design consultant has, based on his experience, included detailed guidelines on the blasting operations in the Plunge Pool close to the foundation of the dam, pumping operations, special treatment of the fault zone and monitoring during works.

Two joint appraisal missions from the European Union, the World Bank and the African Development Bank took place in Zambia in late May 2014 and in August/September 2014 respectively. The Embassy of Sweden joined the cooperating partners' team for the second joint mission. Technical and financial
meetings were held with the Zambezi River Authority, the design consultant (Tractebel Engineering / Coyne et Bellier) and representatives from the government of the Republic of Zambia and the Republic of Zimbabwe. The outcomes of the mission are gathered in the Aide-Mémoire (transmitted to the Commission on October 1st, 2014) which is the reference document to the financiers and to the Governments of Zambia and Zimbabwe to state the project arrangements agreed by all parties and the next steps foreseen. In particular, it lists the agreements on i) Technical elements of the project; ii) Financial options and arrangements; iii) Implementation arrangements, legal framework and flow of funds; iv) Results framework and core indicators; and v) Project documents and timeline.

2.4. Complementary actions

The Zambezi River Authority is undertaking a detailed dam break analysis for the Zambezi River. The consultancy includes a comprehensive assessment of potential consequences of a partial or full dam breach at one or several dams in the Zambezi River basin. The study concentrates on the possible dam breach of the Kariba Dam and the downstream Cahora Bassa Dam in Mozambique. The study is carried out in the 2nd to the 4th quarter of 2014.

Future actions will be taken following the Sector Wide Approach (SWAp). Governance issues and among other energy prices will be addressed in connection with the identification of other interventions in the energy sector. Doing so, the impact on the most disadvantaged populations should be systematically established.

2.5. Donor coordination

Cooperating Partners (CPs) in the Republic of Zambia are committed to support the Government in scaling up access to clean, modern energy and to strengthen the regulatory framework. The total on-going and planned Cooperating Partner assistance in the energy sector is over USD 600 million excluding non-Joint Assistance Strategy for Zambia (JASZ) partners and excluding the Kariba Dam Rehabilitation Project. Main CPs in the sector are the European Union, the Embassy of Japan, the Embassy of Sweden, the World Bank, the African Development Bank, the European Investment Bank, Agence française de Développement and the Embassy of China. The CP group is led by the Troika, which consists of the European Union as lead CP, the Embassy of Japan and the World Bank. The Troika meets regularly with the Minister and Permanent Secretary for energy on behalf of the CPs sector group to exchange views on developments in the sector.

3. Detailed Description

3.1. Objectives

The overall objective of this project is to increase the reliability of supply of clean energy to Zambian and Zimbabwean households and productive users, and to minimize the hydropower risks, e.g. dam failure, to population in the vicinity of the Kariba hydropower plant (estimated 392 720 people affected) in the short and long term. The purpose is to support the Zambezi River Authority in carrying out the Kariba hydropower plant safety rehabilitation over the next 6 years by: preserving and upgrading core dam equipment, through stabilisation of the plunge pool and
refurbishment of the spillway. The plant will then match international safety standards.

3.2. Expected results and main activities

The result will be the stabilization of the plunge pool downstream of the dam wall and the full operability of the spillway system. The installed generation capacity of 1,830MW will then be retained in the long term while the risk to communities (estimated 392,720 people affected) and wildlife will be downgraded.

The project will be co-financed in parallel co-financing with the African Development Bank, the Embassy of Sweden to Zambia, the World Bank and the Zambezi River Authority. The project has two distinct separate rehabilitation components; (i) Plunge Pool Reshaping, and (ii) Refurbishment of the Spillway. Each component will be funded by different co-financing partners. The EDF funds will be earmarked for the Plunge Pool Reshaping. The refurbishment of the spillway will be financed by the African Development Bank, the Embassy of Sweden to Zambia and the World Bank. The funds from the Zambezi River Authority will go to the institutional project support.

The feasibility study and detailed design² commissioned by the Zambezi River Authority (ZRA) was completed in June 2012. A review (second opinion) of the design proposals for stabilisation of the Kariba Dam plunge pool and rehabilitation of the spillway up-stream hydro mechanical facility and associated civil works was conducted in 2012 by an independent panel of experts. The final review report submitted in November 2012 confirmed the design as being the optimal solution.

The request for European Union financing of the rehabilitation of the Kariba Dam was received from the Ministry of Finance (Zambia) and the Ministry of Finance (Zimbabwe) on the 12th of February 2014.

For the EDF financed component the EDF procurement rules will apply and the Contracting Authority will be the National Authorizing Officer of the EDF in Zambia. The Ministry of Mines, Energy and Water Development (Zambia) will be the supervisor and the ZRA will be the implementing agency. Intermediate evaluations will be carried out by the National Authorizing Officer and by the implementing agencies supported by specialised external service providers for the mid-term and final evaluations. The project will be implemented through indirect management under the project approach.

(a) Works contractor for the reshaping of the plunge pool: The contractor will be procured following EDF procedures for works. It will include a pre-qualification stage which will be launched with a suspension clause.

(b) Technical services and supervision consultant: The consultant will be co-financed by the World Bank and the African Development Bank. The consultant will serve as the supervisor's representative/engineer during the civil works contracts, both for the reshaping of the plunge pool and the refurbishment of the spillway, and integrate the works schedule. The scope of work will include a review and confirmation of the initial design work carried out to date, assisting the ZRA in

² Tractebel Engineering and Coyne et Bellier in collaboration with SPRETEC
finalization of the tender documents and oversight of the works during implementation, including blasting operations.

The consultants are on the critical path and need to be appointed before the commencement of the civil works.

(c) Panel of Experts: The independent Panel of Experts will be appointed as a series of individual consultants with considerable experience in the rehabilitation of large dams. The financing for the individual consultants will come from the African Development Bank, the Embassy of Sweden to Zambia and the World Bank funds. The independent panel of experts is expected to visit the site at least twice a year for a period of two weeks, at minimum, and will review and assess the program in order to provide advice to the ZRA.

The composition of the Panel is tentatively as the following:

i) Engineering Expert;
ii) Hydraulic Expert;
iii) Geotechnical Expert;
iv) Electro-Mechanical Expert;
v) Concrete Specialist;
vii) Environmental Management and Rehabilitation Expert;
vii) Social Development and Resettlement Expert.

(d) Environmental and Social Assessment: This consultant will be financed by the World Bank. The Environmental and Social Assessment is required by the national environmental authorities in both countries prior to the commencement of the civil works. The Environmental and Social Service Provider will be appointed on a fast track, single source basis to accelerate preparation of the necessary environmental and social instruments.

(e) Environmental and Social Mitigation: This will be co-financed in parallel by the African Development Bank and potentially by the World Bank. Specific activities and areas of intervention will be identified during the Environmental and Social Assessment.

3.3. Risks and assumptions

The key risks identified are:

- **Do nothing.** Failure to implement the necessary rehabilitation works in a timely manner would increase the risk of catastrophic failure. If a failure occurs that would result not only in displacement of people and economic losses, but also affect the regional energy supplies with impacts on economic growth and development in Zambia and Zimbabwe, as well as the Southern African Region.

- **Hydrological risks.** High flows during implementation of both the plunge pool and the spillway could delay the works and also put the workers safety in jeopardy. Measures have been identified during the design to mitigate adverse hydrological conditions. Protective structures and safety measures have to be in place during the operational implementation phase.
- **Construction risks.** The necessary rock-blasting near the foundations of the dam wall and the variation of pore-water pressure during lowering of the water level in the plunge pool will be carried out according to procedures carefully specified in the detailed design documents. The spillway refurbishment will also be closely monitored and reviewed from the design stage, a strict and detailed Health, Safety & Environment (HSE) plan must be defined and approved prior to start of works.

- **Concrete swelling risks.** The Kariba dam concrete is affected by the alkali-aggregate reaction which causes a swelling of the concrete and an associated loss of mechanical resistance over time. However, the risk of dam failure due to this phenomenon is dismissed by Tractebel Engineering in their feasibility report, and any mitigation actions are not to be considered for at least several decades. In addition an independent expert\(^3\) were contracted to give an opinion on the concrete swelling on dams in general and on the Kariba Dam in particular. The expert stated in his conclusions in the report\(^4\) "Thus there is no concern regarding the dam (Kariba Dam) integrity and risk of dam failure" [due to the alkali-aggregate reaction]. While undertaking the foreseen dam rehabilitation works, concrete samples will be taken from the dam wall and analysed in laboratory to further monitor the alkali-aggregate reaction.

- **Co-financing risks on planning.** The project is co-financed by the EU, the African Development Bank, the Embassy of Sweden to Zambia and the World Bank. Given the number of stakeholders, there is a risk for the project to be delayed at the stage of final loan negotiations and approvals. Premature EU funding will be avoided in so far that the signature of the Financing Agreement is subject to the World Bank and the African Development Bank having secured their own funding. The participation of the Embassy of Sweden being limited to ~8.5% of the total budget, it is not considered as a risk to the overall project financing. The funding from the Zambezi River Authority is not identified as a risk neither as the rehabilitation project is already in its budget. To gain similar confidence on the beneficiaries' side and mitigate political risks, a protocol (Memorandum of Understanding) supporting the project was signed between the governments of Zambia and Zimbabwe in July 2014. This protocol states the funding demand from the two governments, their support to the project and the practical measures that will be put in place to facilitate project execution (duty exemptions, free movements between the two countries, etc…).

- **Implementation capacity.** The Zambezi River Authority does not have sufficient in-house resources or expertise to carry out this civil engineering project without support. Complementary design studies, preparation of tender documents and supervision of the works will be contracted out to international engineering firms to assist the Zambezi River Authority. In addition the design consultant, Tractebel Engineering France / Coyne et Bellier, will continue to be advisors to the Zambezi River Authority.

At the project level the assumptions are that the political situation in Zimbabwe remains stable; and that there are no adverse climate situations with high inflow of water to Lake Kariba that would require excessive spillage.

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\(^3\) Bernard Goguel

\(^4\) "Kariba Dam Concrete Behaviour and Dam Safety" (July 2014)
3.4. **Cross-cutting issues**

The anticipated impacts of works to enlarge the plunge pool are not expected to have any significant adverse environmental impacts. Any potential impacts are likely to be associated with site specific rehabilitation works. The detailed methods of works described in the detailed design document should be followed in particular as regards the blasting operations in the plunge pool close to the foundation of the dam, pumping operations, special treatment of the fault zone and monitoring during works. The works tender documents include the requirement that the contractor presents at the very beginning of the works specific environmental, health and safety plan.

The anticipated environmental impacts of the works to enlarge the plunge pool have been pre-assed regarding the type and the sequence of the works during the feasibility study and design phase. The main findings are as follows:\(^5\);

(i) Environmental impacts are associated with the construction period (seven out of twelve months in a three-year period) and will not affect the day-to-day operating conditions of the hydropower plants after the plunge pool is enlarged. The impacts are therefore temporary.

(ii) Impacts are highly site-specific and are mostly related to land use for the access road in the riverbed, worksite facilities, and the dumping site. No issues associated with the land being used were identified.

(iii) Excavated materials such as rocks and gravel are inert materials and should not cause any pollution in the deposit area.

(iv) Usual construction activities and specific techniques such as blasting will generate pollution (dust, soil disturbance, water turbidity, noise etc.) for the terrestrial and aquatic physical environment. The extension and intensity of impacts should remain local and low, especially for the terrestrial environment.

(v) The most significant pollution and disturbance issues associated with construction activities are related to the neighbouring natural habitats and fauna, potential oil spillages in the Zambezi River, and temporary limitations of crest traffic. These are common issues in construction activities that should be handled properly by the contractor.

(vi) High sediment loads can be expected in the immediate downstream Zambezi River during construction activities, as the plunge pool water level will be lowered by pumping. This will result in higher water turbidity during non-spillage seasons (May-November). However, as the pumping rate during the works will be low in comparison with the mean downstream flow out of the power stations, the impact will not be significant.

(vii) The main potential risk associated with the construction activities, which could affect the downstream environment, is related to flood issues and the behaviour of the cofferdam during spillage. The type of risk depends on the selected design to be defined by the contractor in his tender – either the cofferdam is removed during the spillage period, either it is destroyed by floods and then rebuilt. The latter would lead

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\(^5\) "Information Note to Zambian and Zimbabwean Environmental Agencies", Project Prospectus, Ref.: 1495NT 21 – Tractebel Engineering France / Coyne et Bellier
to the release of varying quantities of floating debris immediately downstream in the 
Zambezi River. As the closest inhabited area is the Zambian village of Manyapa, 
situated some 30 km downstream of the dam, water uses should not be affected.

(viii) Transport and storage of explosives present a specific risk and should be 
handled with care and appropriate management techniques to be specified by the 
contractor.

Further to this pre-assessment an "Initial Framework Environmental and Social 
Management Plan" was released by the ZRA and confirmed the limited 
environmental impact on aquatic and terrestrial ecology. These potential impacts are 
identified as follows: temporary increase in water turbidity, decrease in water quality, 
noise, vibrations and dust.

A full Environmental Impact Assessment will be submitted to the World Bank and 
African Development Bank as part of their internal project approval procedures. The 
Technical Specifications of the Plunge Pool Works Contractor also require the 
contractor to submit an Environmental, Health and Safety Plan at the beginning of 
the activities.

3.5. Stakeholders

The direct beneficiaries of this project will be; the households and productive users 
in the Republic of Zambia and the Republic of Zimbabwe dependent on electricity 
supplies from the secure continued operation of the Kariba Dam; the Zambezi River 
Authority; both electricity utilities, the Zambia Electricity Supply Corporation 
(ZESCO) and the Zimbabwe Power Company (ZPC); and downstream inhabitants 
living in the vicinity of the Zambezi River (mainly in Mozambique) secure from risk 
of catastrophic failure and also possible impact on the Cahora Bassa Dam 
downstream in Mozambique.

The indirect beneficiaries will accrue directly within the regional context of the 
Zambezi River basin, particularly to the downstream riparian states of Mozambique 
and Malawi. The Zambezi River basin is shared among eight riparian states, 
including Zambia and Zimbabwe. The Kariba Dam is part of an integrated 
infrastructure platform within the basin. The benefits through avoided disaster are 
substantial with an estimated 392 720 people being affected and the total cost 
associated with flood losses would be USD 6.85 billion⁶.

Regional benefits will be substantial. These will be realized through avoided 
catastrophe in the Zambezi River basin and continued power production. The 
contribution of the Kariba Dam Hydro-Electric Scheme to the Southern African 
Power Pool (SAPP), both in terms of generation capacity and stability of the system, 
will be assured through the rehabilitation works and continued safe operation of the 
dam. The Southern African Development Community (SADC) will continue to 
benefit from the economic gains supported through the contribution of the continued 
operation of the Kariba Dam Hydro-Electric Scheme.

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⁶ Estimates provided from ongoing work being undertaken by the World Bank and subject to further review and 
confirmation
4. **IMPLEMENTATION ISSUES**

4.1. **Financing agreement**

In order to implement this action, it is foreseen to conclude a financing agreement with the partner country, referred to in Article 17 of Annex IV to the Cotonou Agreement.

However, as mentioned in section 3.3, the Financing Agreement will only be signed under the condition that the financing from the World Bank and the African Development Bank are secured.

A Financing Agreement will be signed for an amount of EUR 64 000 000 under the Bridging Facility to allow for the signature of the works contract in 2015. The tender procedure will be launched under suspension clause before the adoption of the financing decision as it is expressly authorised for the EDF (see Article 19b of Annex IV of the Cotonou Agreement) in all duly substantiated cases in order to ensure early project start-up.

An amendment to the Financing Agreement will be signed at a later stage for an amount of EUR 10 000 000, bringing the total project cost at EUR 74 000 000. The extra EUR 10 000 000 will cover price escalation and contingencies and can therefore be mobilized later into the project execution.

4.2. **Indicative operational implementation period**

The indicative operational implementation period of this action, during which the activities described in sections 3.2. and 4.3. will be carried out, is 60 months from the date of entry into force of the financing agreement, subject to modifications to be agreed by the responsible authorising officer in the relevant agreements. The relevant EDF Committee shall be informed of the extension of the operational implementation period within one month of that extension being granted.

4.3. **Implementation components and modules**

4.3.1. **Indirect management with the partner country**

This action with the objective to increase the reliability of supply of clean energy to Zambia and to minimize the hydropower risks by supporting the Zambezi River Authority in carrying out the Kariba hydropower plant safety rehabilitation, may be implemented in indirect management with the Republic of Zambia in accordance with Article 58(1)(c)(i) of the Regulation (EU, Euratom) No 966/2012 according to the following modalities:

The partner country will act as the contracting authority for the procurement and grant procedures. The Commission will control ex ante all the procurement and grant procedures.

Payments are executed by the Commission.

The entrusted entity is currently undergoing the ex-ante assessment in accordance with Article 61(1) of Regulation (EU, Euratom) No 966/2012 applicable by virtue of Article 17 of the Annex to Regulation (EU) No 567/2014. The responsible
authorising officer of the Commission deems that, based on the compliance with the ex-ante assessment based on Regulation (EU, Euratom) No 1605/2002 and long-lasting problem-free cooperation, the entity can be entrusted with budget-implementation tasks under indirect management.

4.3.2. **Suspension Clause**

The works tender procedure will be launched under a suspensive clause as foreseen in Article 19b of Annex IV of the Cotonou Agreement) in all duly substantiated cases in order to ensure early project start-up.

4.4. **Scope of geographical eligibility for procurement and grants**

The geographical eligibility in terms of place of establishment for participating in procurement and grant award procedures and in terms of origin of supplies purchased as established in the basic act shall apply.

4.5. **Indicative budget for the total amount of the project**

Indicative budget for the Financing Agreement of EUR 64 000 000:

<table>
<thead>
<tr>
<th>Component Module</th>
<th>Amount in EUR thousands</th>
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</thead>
<tbody>
<tr>
<td>4.3.1. – Reshaping of the Plunge Pool composed of</td>
<td>58 000</td>
</tr>
<tr>
<td>4.3.1.1. – Indirect management with the Republic of Zambia</td>
<td>58 000</td>
</tr>
<tr>
<td>Procurement – total envelop under section 4.3.</td>
<td>58 000</td>
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<tr>
<td>Works Contractor for Plunge Pool Reshaping</td>
<td>58 000</td>
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<tr>
<td>4.7. – Evaluation and audit</td>
<td>1300</td>
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<tr>
<td>4.8. – Communication and visibility</td>
<td>500</td>
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<tr>
<td>Contingencies</td>
<td>4200</td>
</tr>
<tr>
<td><strong>Totals</strong></td>
<td><strong>64 000</strong></td>
</tr>
</tbody>
</table>

As detailed in chapter 4.1, an amendment to the Financing Agreement will be signed at a later stage for an amount of EUR 10 000 000, which will bring the total project cost at EUR 74 000 000. This extra funding will cover price escalation and contingencies and can therefore be mobilized later into the project execution.

4.6. **Performance monitoring**

Within this organisation, the EU will control the project through:

- Attendance to the monthly site meetings organized by the Supervision Consultant. A pre-meeting is held with the Supervision Consultant, ZRA, NAO, WB, AfDB and EU. Following this, the Works Contractor joins the attendance for the meeting itself (separate sets of meetings for the Plunge Pool and the Spillway);
- Site visits;
- Full access to the project documentation and monthly reports;
- Technical Audit reports;
• Monitoring consultant for blasting operations;
• Support and review from EU delegation infrastructure section, in particular detailed verification that the EDF procedures are duly followed by the Supervision Consultant and the Works Contractor;
• Coordination and crossing of information with the AfDB and WB.

It is foreseen that the day-to-day technical and financial monitoring will be a continuous process as part of the Supervisors responsibilities. Independent monitoring consultants for the blasting operations will be contracted under a normal service contract launched by the Contracting Authority.

The design consultant, Tractebel Engineering France / Coyne et Bellier, will continue to be advisors to the Zambezi River Authority and carry out its own monitoring of the dam during the implementation of the project.

4.7. Evaluation and audit

Independent consultants recruited directly by the Commission under Framework Contract procedures on specifically established terms of reference will carry out a mid-term evaluation, a final evaluation at the beginning of the defects liability period, and possibly an ex-post evaluation after one year of full operation.

The Commission shall appoint, in accordance with the EDF procurement rules, an independent consultant to carry out Technical Audit missions, which in principle will start at the mobilisation stage of the works contractor, and will be finalised at the end of the defects liability period.

4.8. Communication and visibility

Communication and visibility of the EU is a legal obligation for all external actions funded by the EU.

This action shall contain communication and visibility measures which shall be based on a specific Communication and Visibility Plan of the Action, to be elaborated before the start of implementation and supported with the budget indicated in section 4.5 above.

The measures shall be implemented either (a) by the Commission, and/or (b) by the partner country, contractors, grant beneficiaries and entrusted entities. Appropriate contractual obligations shall be included in, respectively, financing agreements, procurement and grant contracts, and delegation agreements.

The Communication and Visibility Manual for European Union External Action shall be used to establish the Communication and Visibility Plan of the Action and the appropriate contractual obligations.

For the purpose of this project a communication and visibility specialist with experience from similar internationally funded projects will be contracted from August 2014 for a 12-month period financed under the Technical Cooperation facility (TCF) IV (10th EDF) to insure a maximum visibility of the action. The communication and visibility actions identified by the specialist to be funded from the project will target national and international audiences as well as the international engineering community.