**Technical Support for Continued Support on Regional Market Framework Implementation to the Regional Electricity Regulators Association of Southern Africa (RERA)**

Model Connection Agreement

**Prepared for:** **Prepared by:**

Office of Energy Programs Deloitte Financial Advisory Services, LLP

Bureau of Energy Resources 1919 N. Lynn Street

U.S. Department of State Arlington, VA 22209

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Acronyms

|  |  |
| --- | --- |
| DAM | Day-ahead Market |
| DOS  EGREG | Department of State  European Regulators’ Group for Electricity and |
| ENR  ESI | Bureau of Energy Resources  Electricity Supply Industry |
| GPS | Global Positioning System |
| IPP | Independent Power Producer |
| MIF  NERSA | Market and Investment Framework  National Energy Regulator of South Africa |
| RERA | Regional Electricity Regulators Association of Southern Africa |
| SADC | Southern Africa Development Community |
| SAPP  SAPP CC  SAPP ABOM  SAPP OG | Southern Africa Power Pool  SAPP Coordination Centre  SAPP Agreement Between Operating Members  SAPP Operating Guidelines |
| SAPP IUMOU | SAPP Inter Utility Memorandum of Understanding |

# Executive Summary

Work under *Technical Support for Continued Support on Regional Market Framework Implementation to the Regional Electricity Regulators Association of Southern Africa (RERA)* is funded by the United States Department of State through the Bureau of Energy Resources Power Sector Program. This work will continue support to RERA, as well as three selected pilot countries – Zambia, Namibia, and Botswana – to develop tools and procedures identified by the Market & Investment Framework (MIF) and the Framework Roadmap. The primary objective is to further progress with specific generation and transmission projects, as identified by the Southern Africa Power Pool (SAPP) and RERA and to increase SAPP membership and participation in the regional electricity market.

The regional transmission capacity needed to facilitate an increase in cross border power trading in the Southern African region is highly constrained, unreliable, and does not offer redundancy. This is mainly due to the lack of investment in new transmission infrastructure and maintenance of existing capacity. Recognizing the importance of a robust transmission system in meeting electricity demand and allowing the market to operate competitively and efficiently, it is important to develop standards and rules that harmonize the effective use of the interconnected SAPP system.

This report provides one component of such harmonized standards, a Model Connection Agreement.

# background on CONNECTion AGREEMENT practices

Standard and consistent rules are required to allow the connection of a Load or Generator to a utility’s electrical transmission system. In the context of the SAPP, this is especially important if the Load or Generator would like access to an Interconnector in order to trade on the SAPP day-ahead market (DAM) with an entity in a different jurisdiction. Standard rules allow the transmission owner, system operator and the SAPP Coordination Center (SAPP CC) assurance that the connection will not adversely affect the workings of the individual transmission system and the interconnected SAPP system as a whole.

Within the SAPP, the SAPP CC as the coordinating entity should be the endorsing Party of a model Connection Agreement that sets out the terms and conditions upon which a Load or Generator is connected to the SAPP system.

## Existing Practice used by the SAPP

Although the SAPP CC is usually involved in the coordination and management of new transmission interconnectors and entrants earmarked for regional participation, they do not utilize a standard check list, detailed requirements, or a model Connection Agreement for Loads or Generators desiring to connect to the interconnected SAPP system.

Existing independent generators in the SAPP, such as the Lunsemfwa Hydro Company (Zambia), Ndola Energy (Zambia) and Hidro Cahora Bassa (Mozambique), were awarded independent power producer (IPP) status and either follow the connection rules of the national utility or are covered under legacy arrangements. Loads like the Mozal Aluminum smelter in Mozambique and the Skorpion Sink smelter in Namibia, which are supplied by a utility independent from the national utility, are also connected under the rules of the national utility in the absence of any regional guidelines.

Recent major disturbances in the SAPP interconnected system, during which generation and loads have tripped from the system in an uncoordinated and uncontrolled manner, have been attributed in part to the different technical requirements and unique grid connection rules existing across the national grids of Member States. This lack of harmonization thus compromises the security of the integrated power system and increases the probability of more severe disturbances as SAPP utilities become more interlinked through market integration.

Due to the current influx of new IPP’s in the region and the shift away from utilities serving as the designated buyer of generated electricity, the SAPP is currently experiencing a high number of applications from Generators and Loads requesting access to the SAPP system, further increasing the urgency of increased harmonization. Through a separate donor support program, SAPP is developing guidelines for the evaluation of these connection applications, and regional implementation of this Model Connection Agreement will serve to ensure a sound and consistent review process.

## Review of International Leading Practices

The Team conducted a review of literature on grid connection best practice as well as connection agreements from a number of national grids in order to inform the contents of the model Connection Agreement, including the following:

* Europe

Analysis performed in the wake of large disturbances in the European electric power systems indicated a number of problems originating from insufficiently standardized procedures for grid connection and access for European grid users. This led to the European Regulators’ Group for Electricity and Gas (ERGEG) development and publication of the 2009 *Guidelines of Good Practice on Electricity Grid Connection and Access*, which analyzes the needs of, and drafts the key concepts for, common grid connection and access approaches throughout the EU electricity grids.

* Australia

In the Australian state of Victoria, the cost of generation, transmission and distribution of electricity has increased rapidly in recent years, prompting interest from Victorian businesses and consumers to invest in generators. This shift necessitated the development of guidelines for generators suitable for connection to the grid, published in 2013.[[1]](#footnote-2)

* South Africa

With the influx of renewable energy plants in South Africa, the National Energy Regulator (NERSA) and Eskom, the South African national utility, developed a standard grid connection code for renewable generators in 2014.[[2]](#footnote-3)

* Zambia

As part of the development of Zambia’s Renewable Energy Feed-in Tariff Program (REFIT), guidelines for grid connection were developed and provide the outlines of provisions commonly found in connection agreements for generators connecting to the national grid.[[3]](#footnote-4)

## Elements for Consideration in a Model Connection Agreemen

A model Connection Agreement should provide guidance and minimum requirements for Loads or Generators that want to connect to the interconnected SAPP transmission system. It should contain such information as the GPS coordinates of the Load or Generator, the Point of Connection, the owners of the assets, the portion of transmission system being connected and the interconnector that will be accessed. It should also include diagrams of the ownership boundaries and a document detailing the arrangements on how to co-ordinate the maintenance and operation of the Point of Connection.

Drawing from a review of international practices as well as the Team’s practical experience working within the SAPP region, Section 2 below provides suggested clauses for inclusion in a Connection Agreement.

# MODEL Connection agreement

**Section 1 - Applicability**

1. **The Parties**
   1. [Name and registration number of Transmission Owner] incorporated in [Country]; and
   2. and [Name and registration number of the Load or Generator] incorporated in [Country – should be the same as 1a.]
2. **Context of and roles of the SAPP and RERA**

The Parties shall acknowledge the existence of the Southern African Power Pool (SAPP) and the Regional Electricity Regulators Association (RERA) and the need to use the following institutional documents as minimum requirements in concluding this Agreement:

* 1. SAPP Inter Utility Memorandum of Understanding (SAPP IUMOU);
  2. Agreement Between Operating Members; (SAPP ABOM);
  3. SAPP Operating Guidelines; (SAPP OG);
  4. RERA’S Guidelines for Cross Border Trade; and
  5. RERA’s Market and Investment Framework (MIF).

1. **DEFINITIONS**

An explanation of key terms used in this contract is provided in Annex 1.

1. **SUBJECT MATTER**
   1. This clause deals with the terms upon which a Load or Generator will connect to a Transmission Owner’s transmission system and how it will be granted access to a SAPP Interconnector and the interconnected SAPP system as a whole.
2. **TERM OF AGREEMENT**
   1. This Agreement shall commence on \_\_\_\_\_\_\_\_\_\_\_\_\_\_, and end on \_\_\_\_\_\_\_\_\_\_\_\_.
   2. In accordance with its terms and subject to paragraph (c) below, this Agreement shall end on the date specified in point 5a, or alternatively:
   3. This Agreement shall end:
      1. if both Parties agree, and
      2. by notice given to either Party if an administrator or liquidator is appointed.
   4. When this Agreement ends, each Party shall do all such things, at own cost, that may be necessary to disconnect, or arrange for the disconnection of the Load or Generator from the interconnected SAPP system.
   5. Rights and obligations accrued before the end of this Agreement shall continue despite the end of this Agreement.
3. **SCOPE OF AGREEMENT**
   1. Under this Agreement the Transmission Company shall agree to provide connection services to the Load or Generator at the Point of Connection.
   2. The Parties shall also agree to meet other obligations set out in this Agreement and to comply with country specific, SAPP and RERA rules, guidelines as well as regulations.
   3. This Agreement shall not cover the sale, purchase and wheeling of energy.
   4. The Transmission Company shall provide, install and maintain all equipment for the provision of connection services at the Point of Connection safely and in accordance with the energy laws of the relevant country.
4. **GENERAL OBLIGATIONS**
   1. The Parties shall agree to meet other obligations set out in this Agreement and to comply with country specific, SAPP and RERA rules, guidelines and regulations.
   2. Provision of information

Both Parties shall provide any information that is reasonably required for the purposes of establishing this Agreement. The information shall not be misleading or deceiving in relation to any information provided.

* 1. Updating of information

Each Party shall promptly inform each other of any:

* 1. change to its contact details;
  2. change that it may be aware of that materially affects access to equipment involved in providing connection services;
  3. any proposed change in plant or equipment, including metering equipment; or
  4. any change to the capacity or operation of the connected plant or equipment that may affect the quality, reliability, safety or metering of the supply of energy to the Transmission Owner’s system or that of the interconnected SAPP system.

1. Laws and other requirements

Each Party shall comply with:

1. the energy laws of the country; and
2. the SAPP and RERA rules, guidelines and regulations.
   1. Indemnities
3. In the event that the Load or Generator buys or sells electricity from or to any other SAPP Member, the Transmission Owner shall be indemnified and held harmless against any losses, damages, expenses and liabilities that arise as a result of any claims made against by that SAPP Member.
4. The Parties shall further agree to indemnify each other, SADC, SAPP and RERA and hold each other harmless from and against all liabilities or claims for any loss or damage to itself or third parties, any death or injuries to any person, and all liabilities or claims which we may incur to any third Party arising out of:
   * 1. the operation of equipment at the Point of Connection;
     2. representation or promise made by either Party, or on either behalf, to any SAPP Member;
     3. the use of electricity which has passed from or to the Point of Connection, to or from a SAPP interconnector;
     4. each Parties employees’, agents’ or contractors’ failure to comply with any of its obligations under this Agreement; and
     5. each Party or its employees’, agents’ or contractors’ negligent or reckless acts or omissions.
5. **WRONGFUL AND ILLEGAL USE OF A SAPP INTERCONNECTOR** 
   1. Illegal use of Interconnector and consequences

The Load or Generator shall take reasonable steps to ensure others do not:

* 1. illegally use capacity of the Transmission Owner’s system or the Interconnector;
  2. interfere or allow interference with any of equipment of the Transmission Owner except as may be permitted by law;
  3. use the transmission system’s and Interconnector’s capacities in a manner that:
     1. unreasonably interferes with the supply of energy to another customer or SAPP Member; or
     2. causes damage or interference to any third Party; or

1. use the services provided in a way that is not permitted by law, the SAPP / RERA rules, guidelines and regulations or this Agreement.
   1. Consequences for wrongful or illegal use of the Transmission Owner’s network and Interconnector capacities.

If a Load or Generator does not comply with the clause above, the Transmission Owner shall take any or all of the following actions:

1. estimate the amount of Transmission System or Interconnector capacity obtained wrongfully or illegally and take debt recovery action against for that amount;
2. undertake any necessary rectification work at the Load or Generator’s cost; and
3. arrange for the immediate disconnection of the Load or Generator.
4. **TRANSMISSION Owners Liability**
5. Quality and reliability of electricity supply
6. The quality and reliability of the Transmission Owner’s system shall be subject to a variety of factors that may be beyond its control, including accidents, emergencies, weather conditions, vandalism, system demand, the technical limitations of its transmission system and the acts of other persons, including at the direction of a relevant utility.
7. Subject to the next clause, unless the Transmission Owner has acted in bad faith or negligently, liability shall exclude any loss or damage the Load or Generator may suffer as a result of the partial or total failure to avail the Point of Connection.
8. Subject to the next clause, all liabilities related to the loss or damage suffered by the Load or Generator that is not a result of the partial or total failure to supply / receive electricity at the Point of Connection shall be excluded.
   1. Limited liability
9. The Party’s liability shall only extend to any physical losses and damage the Load or Generator suffers and for personal injury due to the partial or total failure to supply or receive electricity at the Point of Connection caused by the Transmission Owners negligence or bad faith which includes:
   * 1. problems in the quality of supply of electricity at the Point of Connection (such as power surges and drops); and
     2. interruptions to or failures of the supply of electricity at the Point of Connection.
10. Each Party’s liability to the other shall be limited to [\_\_] as indexed annually, by the National Energy Regulator.
11. **INTERRUPTION OF POINT OF CONNECTION**
    1. The Transmission Owner may interrupt the availability of the Point of Connection for planned or unplanned maintenance.
    2. Planned Interruptions
12. Planned interruptions may be made for the following reasons:
    * 1. for the maintenance, repair or augmentation of the Transmission system including maintenance of the metering equipment; and
      2. for the installation of new equipment or the connection of other feeder bays.
13. If scheduled transactions on a SAPP Interconnector will be affected by a planned interruption, the Transmission Owner shall provide at least [ ] business days’ notice to the SAPP CC.
    1. Unplanned Interruptions
    2. Either party may interrupt the Point of Connection in circumstances where there is an immediate threat of injury or material damage to any person, property, including:
       1. unplanned maintenance or repairs;
       2. health or safety reasons;
       3. in an emergency as required by a relevant authority; or
       4. to restore supply to some transmission owner’s other customers.
    3. If an unplanned interruption is made, the Transmission Owner shall use all available means to restore the Point of Connection as soon as possible.
    4. The Transmission Owner shall make information about the unplanned interruptions (including the nature of any emergency and where possible, an estimate of when the Point of Connection will be restored) available within 1 hour of the interruption.
14. **DISCONNECTION OF THE POINT OF CONNECTION**
15. The Transmission Owner may disconnect the Point of Connection if the Load or Generator:
    1. uses the Point of Connection wrongfully or illegally;
    2. fails to pay any direct charges to the other Party under this Agreement;
    3. is in an emergency for health and safety reasons; or
    4. is required to do so at the direction of a relevant authority which may include the SAPP CC or RERA.
16. Notice and warning of disconnection

The Transmission Owner may disconnect the Point of Connection only if:

* 1. a disconnection warning notice had been issued; or
  2. the Load or Generator failed to rectify the matter that gave rise to the right to disconnect within the time period set out in the warning notice.

1. Parties rights after disconnection

The disconnection of the Point of Connection shall not limit or waive any of the Parties rights and obligations under this Agreement arising before disconnection, including any of Parties’ obligation to pay for services rendered.

1. **RECONNECTION OF POINT OF CONNECTION AFTER DISCONNECTION**
2. The Point of Connection may be reconnected if the reason for the disconnection has been resolved to the satisfaction of the Transmission Owner.
3. **NOTICES AND INVOICES**
   1. Notices and invoices related to this Agreement shall be sent in writing through courier, post, or electronically.
   2. A notice or invoice under this Agreement shall be deemed to have been received:
      1. on the date it is handed to the other Party or left at the Party’s premises;
      2. [ ] business days after it is posted; or
      3. on the date of transmission if sent electronically.
4. **COMPLAINTS AND DISPUTE RESOLUTION**
5. If a Party to this Agreement wants to lodge a complaint relating to the Point of Connection, it shall be lodged in accordance with the standard complaint and dispute resolution process of the Transmission Owner or escalate it to the SAPP CC if the complaint is of a regional nature.
6. **FORCE MAJEURE**
7. Effect of a force majeure event

If either Party cannot meet its obligation under this Agreement because of an event outside the control of the Parties:

* 1. the obligations, other that the obligation of payment, shall be suspended to the extent they are affected by the event for so long as the event continues; and
  2. the affected Party shall use all available means to give the other prompt notice of that fact including full particulars of the event, an estimate of its likely duration, the extent to which obligations are affected and the steps taken to remove, overcome or minimize those effects.

1. Deemed prompt notice

If the effects of a force majeure event are widespread, the Parties shall be considered to have given prompt notice if the necessary information is made available by way of a telephone call within 30 minutes of being advised of the event or otherwise as soon as practicable.

1. Obligation to overcome or minimize effect of force majeure event

The Party that claims a force majeure event shall use all available means to remove, overcome or minimize the effects of that event as soon as practicable possible.

1. **APPLICABLE LAW**
2. This Agreement shall be governed by the law of [Country]. (to be agreed by Parties)
3. **GENERAL**
4. Some obligations placed on the Parties under this Agreement may be carried out by another person/entity. If an obligation is placed on a Party to do something under this Agreement, then:
   1. the Party shall be considered to have complied with the obligation if the person/entity is acting on behalf of the Party; and
   2. if an obligation is not complied with, the Party that subcontracted the obligation shall remain liable for failure to comply with this Agreement.

**Section 2 - Specific Provisions**

1. **Engineering report**

The Transmission Owner shall provide the Load or Generator with an “engineering report” and the Load or Generator shall ensure that the that the installation is installed, commissioned, operated and maintained in accordance with the requirements of that engineering report.

The engineering report is a document prepared by the Transmission Owner setting out technical requirements with which Loads and Generators that desire access to a SAPP interconnector must comply to ensure that the connection is compatible with the interconnected SAPP system and that it does not adversely affect the SAPP system or the systems of other SAPP Members.

1. **Compliance Monitoring Program**

By no later than 6 months after the commissioning of the Point of Connection, the Load or Generator shall prepare and have approved by the Transmission Company a compliance monitoring program which sets out the procedures the Load or Generator will employ to monitor the compliance of the Point of Connection with the National and Regional Grid Codes.

1. **Maximum entitlements**
   1. The Parties shall agree the specifications of the Maximum Transfer Limits for the Point of Connection and that of the Transmission Owners system to or from the interconnector. These specifications shall be based on the line and terminal equipment capacities at the Point of Connection, the capacity of the parts of the transmission systems of Transmission Company which service the Interconnector.
   2. If the Load, Generator or the Transmission Company wishes the Maximum Transfer Limit to be increased, the Transmission Company shall submit an application to the SAPP CC under the SAPP ABOM to increase the limit.
   3. The Load, Generator and the Transmission Company shall acknowledge that if the scheduled transactions exceed the Maximum Transfer Limit:
      1. this may cause damage to equipment at the Point of Connection, the Interconnector and its terminal equipment; and
      2. this may adversely affect the Transmission Company to supply services to the Load or Generator and other users of the Interconnector.
   4. The Transmission Company shall notify the Load or Generator if it has reason to believe they exceeded the Maximum Transfer Limit or if there is a material risk they may do so to ensure necessary steps are taken to ensure the Maximum Transfer Limit is not exceeded in the future.
   5. If any Party exceeds the Maximum Transfer Limit on more than one occasion the SAPP CC may consider it reasonably required for the protection and/or the security of supply of the interconnected SAPP system to require the exceeding Party to install equipment to ensure that the Party does not exceed the Maximum Transfer Limit in the future. The exceeding Party shall comply with any such requirement within the time frame indicated by the SAPP CC and provide to the SAPP CC evidence to confirm compliance.
2. **Metering**
   1. The Transmission Company shall, at all times, ensure that there is metering installed at the Point of Connection.
   2. Metering equipment shall be of the telemetering type with adequate communication facilities so as to provide the actual flows of active and reactive power at the Point of Connection and facilitate reconciliation.
   3. Where communication facilities are temporarily not available the differences between locally metered figures and those quantities used in daily energy accounting shall be reconciled at agreed time periods.
   4. Metering equipment shall be tested as recommended by the SAPP Operating Sub-Committee. If the meter complies with specifications, then the Operating Member who has requested the tests shall bear costs related to testing. Otherwise, the costs of such tests shall be borne by the owner of the meter. Representatives of any Operating Member shall be given the opportunity to witness the tests.
3. **Protection schemes**
   1. As prescribed in the SAPP Operating Guidelines, the Transmission Company shall co-ordinate the application and maintenance of protective relays. They shall develop and implement criteria which will enhance system reliability with minimum adverse effects at the Point of Connection, on the Interconnector and that of the interconnected SAPP system.
   2. Appropriate technical information concerning protective relays shall be available in the Control Center of the Transmission Company.
   3. System Controllers shall be familiar with the purpose, operation and limitations of protection schemes.
   4. If equipment or protection relay fails and reduces system reliability, the appropriate personnel shall be notified and corrective action shall be carried out as soon as possible.
   5. All new protective schemes and all modifications to existing protective schemes shall be coordinated between the Transmission Company, the SAPP CC and the Load or Generator.
   6. The Transmission Company and the Load or Generator shall inform each other and the SAPP CC of changes in generating sources, transmission, load or operating conditions which could require changes in the Interconnector protection schemes.
4. **Interruptions and Curtailments**
   1. Transaction scheduled from or to the Load or Generator to or from the Interconnector shall be fully delivered at all times as scheduled except where interruptions or curtailments are caused by Force Majeure Events, by the operation of protection schemes or by the installation, maintenance, repair and replacement of facilities where such events were unforeseeable and therefore notice could not be given.
   2. No Party can guarantee that it will be able to continuously deliver or receive electricity to the transaction points. Without limiting the foregoing, the events which may lead to an interruption or curtailment in the supply of electricity may also interrupt, curtail, or lead to an interruption or curtailment in, its ability to deliver electricity into the interconnected SAPP system.
   3. Where there is an interruption or curtailment (for any reason) in the availability of the Transmission Company’s network to the Interconnector then the Transmission Company:
5. shall comply with such directions issued between the Load or Generator, or the SAPP CC for the purpose of ensuring that interruption or curtailment is carried out safely; and
6. shall ensure the protection and safe operation, shutdown and reconnection of the Interconnector.
7. **Limitation**
8. Acknowledgement

The Transmission Company shall acknowledge and agree that the connection of the Load or Generator to its system is subject to fluctuations and interruptions from time to time which may affect its ability to import, export or transport electricity on the SAPP Interconnectors for a variety of reasons and, therefore, the Transmission Company shall acknowledges and agree that:

* 1. They are unable to, and do not, represent, warrant or guarantee to the Load or Generator, other SAPP Members, the SAPP CC and RERA that it will be able to import, export or transport electricity into the Interconnected SAPP system at any time; and
  2. such fluctuations or interruptions may damage the Interconnector or cause it to malfunction.

1. Release

The Transmission Company, the Load or Generator, SAPP CC and RERA shall release and discharge each other from and against any loss, cost, damage, expense or liability that may incur which arises out of, or in relation to any:

* + 1. inability to import, export or transport electricity into its transmission system or at the Point of Connection at any time; or
    2. malfunction of, or any damage to, the Interconnector or the Point of Connection that arises out of, or in relation to, any fluctuations or interruptions from time to time on the Interconnector or at the Point of Connection except to the extent that any such malfunction or damage is a result of fluctuations or interruptions caused by negligence or bad faith in which case it is agreed that liability is limited to direct costs of repairing such malfunction of, or damage to, the Interconnector or point of connection.

1. **SAFETY AND TECHNICAL REQUIREMENTS**
   1. The Transmission Company shall ensure that the Point of Connection complies with the:
      1. National Grid Code in its country;
      2. Regional Grid Code;
      3. National and Regional System Operating Guidelines;
      4. Any specific rules of the Joint Operating and Maintenance Committee that oversee the operation of the Interconnector (Joint Operating Protocol);
      5. SAPP IU MOU;
      6. SAPP ABOM;
      7. SAPP OG;
      8. Engineering Report; and
      9. Good engineering industry practice.
   2. The Transmission Company shall inform the Load or Generator, the SAPP CC and RERA as soon as practicable if it fails to comply with the above-mentioned requirement.
   3. Where the Transmission Company fails to comply with any requirement, SAPP CC or RERA may direct the Transmission Company to make such changes required to the Interconnector or Point of Connection as required to address the failure.
   4. The Transmission Company shall comply with any reasonable requirement in relation to the installation of additional equipment on or in connection with the Point of Connection that may be deemed necessary by the SAPP CC or RERA to ensure the safe and reliable operation of the interconnected SAPP system.
2. **Non-compliance, notification and consequences**
   1. The Parties shall notify each other if one Party does not or may not comply with the requirements of this Agreement or if one Party has otherwise breached this Agreement.
   2. If a notice is served, the other Party shall undertake such testing, inspection and monitoring as required to determine whether it is complying with the requirements of this Agreement and, where it is not so complying, must undertake such remedial action as necessary to ensure it complies with the requirements of this Agreement. This includes, without limitation, undertaking such testing, inspection, monitoring and other remedial action as reasonably required.
3. **Operation, Work and Approvals**
   1. The Transmission Company shall ensure that the Point of Connection is operated and maintained in a manner that does not compromise the safe operation of the interconnected SAPP system, does not cause damage to the interconnected SAPP system and does not interfere with the continuity or quality of supply provided by the interconnected SAPP system.
   2. The Transmission Company and the Load or Generator shall comply with the operating protocols set out in the document titled “Joint Operating Protocols” which document must be agreed and signed as a condition to use the Point of Connection.
   3. The Transmission Company and the Load or Generator shall:
      1. provide each other with a copy of all government (regulator and relevant energy department), SAPP and RERA approvals relating to the Point of Connection;
      2. notify each other as soon as practicable if there is a change to, including without limitation a revocation of, any such approval and provide to each other a copy of the revised approval or document effecting the revocation; and
      3. notify each other if there is any reason to believe that an approval may be revoked and the revocation would have the effect that it would cease to be lawful for a Party to own and/or operate the Interconnector.
   4. The Parties shall ensure that they can be contacted at all times (24 hours a day, 7 days a week) and have authorized, English speaking and duly qualified personnel available who are able to attend to emergencies and other urgent situations in respect to the Interconnector and ensure up to date phone numbers and email addresses are available for such personnel.
4. **Fault reporting**
   1. The Parties shall notify each other as soon as reasonably practicable if they become aware of any fault or irregularity on the Point of Connection.
   2. Where the Parties notify each other of a fault or irregularity at the Point of Connection or otherwise become aware of a fault or irregularity, then the Transmission Owner shall undertake such investigation of the fault or irregularity as it considers appropriate having regard to good electricity industry practice, applicable laws and the SAPP Operating Guidelines.
   3. Where the fault or irregularity is caused by a Party’s failure to comply with this Agreement, then the Party shall:
      1. take such steps in relation to the Point of Connection as required to remedy the fault or irregularity and provide such evidence as required to substantiate that such steps have been successfully taken; and
5. pay the cost for investigating the fault or irregularity, for any action taken in respect to the interconnected SAPP system due to the fault or irregularity and for any review the SAPP CC or the other Party undertakes to remedy the fault or irregularity.
6. **Record keeping**

The Transmission Company shall:

* 1. keep adequate records in accordance with good electricity industry practice of all inspections, testing and maintenance undertaken with regard to the Point of Connection and provide these to each other and the SAPP CC for inspection upon request.
  2. carry out such inspection and testing of the Point of Connection (including its protection systems) as is reasonably require (whether because of a fault or incident which has arisen or otherwise).
  3. from time to time when requested, provide to each other and the SAPP CC such information requested to enable the other to exercise its rights or discharge its obligations under this Agreement, under applicable law or as required by the SAPP CC for the general management of the SAPP interconnected system. Such information must be provided in the form and within a reasonable timeframe after being requested.

1. **Charges**
   1. Subject to sub clause d, the Load or Generator shall pay the Transmission Company charges specified in Annex 2, any other charges, fees or amounts referred to in this Agreement and any other charge or fees they are permitted to charge by law or per SAPP obligation.
   2. The Load or Generator shall procure Control Area Services from a SAPP authorized control area and pay the associated Control Area Service Charge.
   3. In addition to the above, all Loads and Generators shall pay a SAPP system wide users fee to the SAPP CC.
   4. All the SAPP related charges shall be as detailed in the SAPP Agreement Between Operating Members or as negotiated bilaterally
2. **Invoicing**
   1. Except where the SAPP CC agrees to invoice and pay the Transmission Company the SAPP related charges, the Transmission Company shall be entitled to levy charges under this Agreement and to issue invoices directly to the Load or Generator for amounts payable under this Agreement. Invoices shall be paid within [\_\_] days of receipt.
   2. Where an invoice is not paid within the time required, interest shall be paid on the overdue amount until such time as the overdue amount and any accrued interest is paid.
   3. Any unpaid amount shall bear interest from the date due until the date of payment.
   4. The interest shall be calculated at five percent per annum.
   5. All invoices under this Agreement shall be in US Dollars unless otherwise agreed.
3. **Insurance**
   1. During the term of this Agreement, the Parties shall maintain insurance policies as specified below:
      1. public liability for not less than $ [\_\_\_\_] per occurrence; and
      2. property insurance for any physical damage to the Point of Connection and associated electrical equipment for not less than the replacement value of that infrastructure.
   2. The Parties shall provide each other and the SAPP CC with certificates for the insurance policies within 5 business days of the Commencement Date and within 5 business days of any renewal of those policies.
   3. The insurance policies shall:
      1. be taken out with reputable insurers; and
      2. contain such terms and cover such risks as would be required by a prudent operator, with a business similar to that of the Parties, from its insurers.
   4. The Parties shall notify each other and the SAPP CC, as soon as practical, of any material variation or cancellation of an insurance policy required under this Agreement.
   5. No insurance policy maintained by either Party shall limit the Parties obligations under this Agreement
4. **Change in law**
   1. If, due to a change in law;
      1. this Agreement ceases to comply with the requirements of those law; or
5. this Agreement ceases to be compatible with the current SADC regulatory regime for electricity such that it is not possible or practicable for the parties to perform their obligations or exercise their rights in the manner envisaged as at the time of execution of this Agreement

either Party may propose amendments to this Agreement to ensure this Agreement complies with applicable laws and is compatible with the regulatory environment.

1. **Confidentiality**
2. Confidential Information

Each Party shall treat and keep confidential:

* + 1. the terms of this Agreement; and
    2. all information disclosed to that Party, under this Agreement, pursuant to the transactions contemplated by this Agreement or during the negotiations preceding the execution of this Agreement by the other Party.

1. Permitted Disclosure

Despite clause 17a, Confidential Information may be disclosed by a Party receiving that information in the following circumstances:

* + 1. when required by law or by the requirements, rules or guidelines of a Party’s national regulator, its shareholder, RERA or the SAPP CC;
    2. to any of a Party’s insurers or advisers thereto;
    3. as necessary to enable a Party to discharge its obligations, or exercise its rights, under this Agreement; or
    4. as necessary to enable a Party to claim force majeure under another Agreement or to enable a Party to deal with any claim that it is in breach of another Agreement.

A Party disclosing Confidential Information under this clause shall use all available means to ensure that the persons to whom it discloses that information undertake to keep the information confidential, minimize disclosure and use the Confidential Information only for the purpose for which it was disclosed to them.

1. **Credit Support**
   1. Credit Support at Commencement
      1. Unless the Load or Generator has an Acceptable Credit Rating, or its obligations under this Agreement are guaranteed on terms acceptable to the Transmission Owner by an entity with an Acceptable Credit Rating, they shall provide Credit Support.
      2. An Acceptable Credit Rating means a credit rating of not less than a Standard and Poor’s rating of [\_\_\_\_] (or its equivalent from another recognized credit rating agency).
   2. The Credit Support shall be:
2. A bank guarantee, in a form reasonably satisfactory to the Transmission Company, from an African based financial institution with an Acceptable Credit Rating and otherwise satisfactory to the other Party acting reasonably;
3. a deposit placed with the Transmission Company; or
4. such other form of credit support as proposed by the Load or Generator and accepted by the Transmission Company at its absolute discretion.
   1. Amount of Credit Support
5. The amount is based on a number of months of charges and equal to a reasonable estimate of the quantum of the number of months of the charges, as estimated and agreed by the parties every two years.
   1. Recourse to Credit Support

The Transmission Company shall have recourse to the Credit Support to recover:

* + 1. any amounts due under this Agreement but unpaid; and
    2. any costs or expenses incurred and losses and damages suffered by the Transmission Company or which the Load or Generator is liable under or in connection with this Agreement.
  1. Replacement of Credit Support

If the Transmission Company draws upon Credit Support then the Load or Generator shall, within 5 business days of the Credit Support being drawn upon, provide replacement Credit Support.

1. **DISCONNECTION**
2. Subject to and to the extent permitted by applicable law and SAPP rules, the Transmission Company may immediately proceed to disconnect the Load or Generator from its transmission system:
   1. where the Load or Generator fail to comply with this Agreement and such failure threatens the integrity or reliability of the Point of Connection, the Transmission Owners system and that of the interconnected SAPP system;
   2. if Credit Support required by this Agreement is not in force and if the Load or Generator fail to correct that breach within 10 business days of notice;
   3. where the Load or Generator commit any other breach of this Agreement and fail to remedy that breach within 30 days of notice;
   4. where the Load or Generator commit any intentional unlawful act in respect to the Point of Connection, the Transmission owner’s system or the interconnector SAPP system;
   5. where required due to health and safety reasons;
   6. to manage or address an emergency; or
   7. where required by a direction of a government agency, SAPP or RERA.
3. **RECONNECTION**
4. Where the reason for the disconnection was the Load or Generator’s failure to comply with this Agreement, failure to comply with an applicable SAPP rule, or another wrongful act or omission, the Load or Generator may be reconnected if within 10 days of the disconnection the matter which led to the disconnection is remedied.

**Section 3 – National and Regional Grid Code requirements**

**Section 3A – Regional Standards**

The Transmission Company shall adhere to the “Regional Grid Code for the Interconnectors” that is being developed and adopted by RERA for the Interconnector.

**Section 3B – Access National Standards**

[This section will be completed on a case by case basis depending on the specific circumstances and National Grid Codes of the interconnecting Transmission Companies and with specific relationship to the SAPP and RERA rules, guidelines and Agreements]

**Section 3C – Quality of Supply**

[This section will be completed on a case by case basis depending on the specific circumstances and National Grid Codes of the interconnecting Transmission Companies and with specific relationship to the SAPP and RERA rules, guidelines and Agreements]

**Section 3D – Recovery of Capital**

[This section will be completed on a case by case basis depending on the specific circumstances and National Grid Codes and Pricing policies of the interconnecting Transmission Companies and with due consideration of the SAPP and RERA rules, guidelines and Agreements]

**Section 3E – Adjustment for Losses**

[This section will be completed on a case by case basis depending on the specific circumstances and National Grid Codes of the interconnecting Transmission Companies and with specific relationship to the SAPP and RERA rules, guidelines and Agreements]

**Section 3F – Maximum Export Limit and Maximum Import Limit**

[This section will be completed on a case by case basis depending on the specific circumstances and National Grid Codes of the interconnecting Transmission Companies and as determined by the Planning Sub Committee of the SAPP giving due consideration to the SAPP and RERA rules, guidelines and Agreements]

**Section 4 - SAPP and RERA requirements**

As the responsible entities for regional harmonization, SAPP and RERA may have specific requirements that need to be reflected in this Agreement. These may include the notification of planned outages, change in system configurations, dispute resolution or any other matter that may have an impact on other utilities or the integrated SAPP transmission system. Obtaining this information to customize the contents of the model Connection Agreement was a primary objective of the Team’s trip in April 2018 but no feedback was received from both.

**Annex 1 – Definitions**

**Transmission Owner** – Is the owner of the of the transmission system the Load or Generator is connecting to. This may be the national utility or a private transmission company in a SAPP Member State.

**Point of Connection** – Is the point where the Load or Generator is electrically and physically connected to the Transmission Owner’s electricity network.

**Interconnector** – Is the asset used to interconnect two Transmission Owner’s electrical systems, normally across the border of two countries.

**Annex 2 - Transmission Charges**

**Connection Charge**. A charge applied to a Load or Generator to connect to the Transmission Owner’s transmission system. The charge is used to cover costs and expenses as they relate to capital expenditures, overhead, return, and the costs of financing and taxes and any incidental expenses. Charges are applied to all Loads or Generators for any portion of the transmission system used and as specified in the tariff schedule.

**Monthly Demand Charge**. A monthly demand charge paid to the transmission system operator for a market participant’s load on the system (including losses) at the time of the monthly peak load on the system.

**Transmission Use of System Charge.** A point-to-point transmission service charge applied as per the scheduled tariff that is applicable between specified points of receipt and delivery pf power.

**Transmission Loss Charge**. A charge to each market participant of the transmission system for the cost of energy lost in the transmission of electricity from a generation resource to load.

**Control Area Service Charge**. A charge paid to the power system operator who is managing a shared generation control scheme and maintaining balance between capacity and energy purchased and load within the system and maintaining frequency and interchange with other control areas.

**Ancillary Services Charge.** A charge for those services that are necessary to support the transmission of capacity and energy while maintaining reliable operation of the transmission system.

**Transmission Congestion Charge.** A charge attributable to the increased cost of energy delivered at a given load bus when the transmission system serving that load bus is operating under constrained conditions. For real time transactions, it is the congestion component of the locational marginal price. The transmission congestion costs may be positive or negative depending on output from generators and consumption by loads.

Congestion pricing may also apply to the day-ahead energy market in SAPP and is equal to the difference between the congestion charges for day-ahead energy market withdrawals and injections in to the transmission system.

Additionally, balancing congestion charges may be applied as the difference between the congestion charges collected from SAPP Members that are purchasing energy in the real-time energy market and congestion charges paid to Members that are selling energy.

**Locational Reliability Charge.** A charge which may be applied to market participants as specified in the tariff schedule and the reliability assurance Agreement.

# Next Steps

This Model Connection Agreement will provide any Load or Generator wanting to connect to the SAPP interconnected system with a comprehensive picture of the rules and regulations put in place by the SAPP and RERA. It also provides a baseline of critical clauses, rights, and obligations that should reduce the time required for parties to conclude the agreement.

Following the Department of State’s review, the Team will share this draft Connection Agreement with RERA, who should then consult with the SAPP and the three pilot countries to test the application of the clauses of the Agreement on the ZIZABONA interconnection project. Once approved by RERA, the Model Agreement may be presented to the SADC Directorate of Infrastructure and Services, who after further review and consideration, can table the Agreement to the SADC Energy Ministers for adoption and use across the Southern African region.

1. State Government of Victoria. *Guide to Connecting a Distributed Generator in Victoria.* 2013. [↑](#footnote-ref-2)
2. National Energy Regulator of South Africa (NERSA). *Grid Connection Code for Renewable Power Plants Connected to the Electricity Transmission System or the Distribution System in South Africa.* July 2014. [↑](#footnote-ref-3)
3. Zambia Energy Regulation Board (ERB). *Zambia Renewable Feed-in Tariff (REFIT) Program – Model Grid Connection Agreement.* February 2016. [↑](#footnote-ref-4)