REGULATED INDUSTRIES COMMISSION

REVISION OF THE CAPITAL CONTRIBUTION POLICY

FOR THE

TRINIDAD & TOBAGO ELECTRICITY COMMISSION

March 2022

This document presents the RIC's assessment and proposals for a revised Capital Contribution Policy for T&TEC. The RIC invites public comments on its proposal.

Consultative Document

Table of Contents

List of Tables 3
1.0 INTRODUCTION 4
1.1. Purpose of this Consultative Document 5
1.2. Structure of this Consultative Document 5
1.3. Responding to this Consultative Document 5
2.0 BACKGROUND - DEVELOPMENT OF THE CAPITAL CONTRIBUTION POLICY 7
3.0 CCP (2009) REVIEW 9
3.1. Pricing Principles 10
3.2. Main Components of the Capital Contribution Policy 11
3.2.1. Payment of Capital Contribution and Connection Point (charging policy) and Capital Contribution Calculation Method 11
3.2.1.1. Discussion and Proposals for the way forward 14
3.2.1.1.1. Shortfall/Defaults in Incremental Revenue/ Under-recovery of T&TEC's Capital Outlay for Customer Connection. 25
3.2.2. Contestability 27
3.2.3. Reimbursement 28
3.2.4. Ownership of Customer Contributed Assets 30
3.2.5. Recognition and Valuation of Customer Contributed Assets 31
3.2.6. Dispute Resolution 31
3.2.7. Monitoring 32
4.0 OTHER RELEVANT MATTERS FOR CONSIDERATION 33
4.1. Policy Scope 33
4.2. Underground Infrastructure in Developments 34
4.3. Disclosure of Costs (including Third-Party Costs) 34
4.4. Connection of Small Scale Distributed Renewable Energy Generation Systems 35
5.0 SUMMARY OF THE MAJOR AREAS OF PROPOSED CHANGES 38
APPENDICES 39
Appendix A – Key Definitions 39
Appendix B – Example of Connection Services of an electricity utility in Australia 40
Appendix C - Current & Proposed Charging Policy 42

List of Tables

Table 1: Classification of the owners of buildings with multiple meter bases 13
Table 2: Key features of the Incremental Revenue Approach for Capital Contribution in other Jurisdictions 23
Table 3:Reimbursement Entitlements of T&TEC's three main customer classifications..... 30
Table 4: Connection Charging for Small RE Generator in Jurisdictions..... 36

1.0 INTRODUCTION

A capital contribution (CC) is a cost that is paid upfront to facilitate infrastructure works for customer-initiated works. It is used to recover from individual customers the specific costs their request imposes on the network. At present, some customers of the Trinidad and Tobago Electricity Commission (T&TEC) are required to make CCs for some network costs, while other related costs are recovered via 'use of system' charges (network tariffs). The way the balance is struck between customers' CCs and network tariffs has important implications for a utility and its customers.

The use of CC is not specific to the electricity industry but is common to other network/utility industries such as water and wastewater. The core issue surrounding the use of CCs is the allocation of costs for new connections between existing and prospective customers. At one extreme, it is unreasonable for a prospective customer wishing to connect a new house to the electricity distribution network to pay, for example, the full cost of a sub-station simply because the existing resources are fully committed. At the other extreme, it is equally unreasonable for an individual wishing to connect a house in a remote area or where existing capacity is inadequate or constrained, to expect existing customers to meet the cost, for example, of new infrastructure such as a sub-substation. Further, some of the new network infrastructure required may be paid for and used initially by one customer but shared with other customers later as the network expands, creating a "free rider" problem.

For both existing and new customers, the allocation of the associated costs needs to be equitable and transparent. A careful assessment of the impact of the CC and the overall connection charging regime is, therefore, required. The final decision of this assessment is typically articulated in a Capital Contribution Policy (CCP).

A CCP often forms part of a wider connection policy. It typically describes the ownership, funding arrangements and obligations for customer-initiated capital work on the electricity distribution network. It includes a description of the circumstances under which a utility may require a CC from customers and the methodology for determining these contributions. CPPs are published for

public information and often describe how they are consistent with the electricity pricing principles.

As customers use of electricity changes, and emerging technologies are integrated with the distribution grid, there is a need for continuous review of the method utilised by a utility to recover the costs of supplying electricity on its network. The method used affects both capital contributions charges and user charges.

1.1. Purpose of this Consultative Document

This document aims to obtain feedback and comments from the public on the RIC's assessment of its Capital Contribution Policy 2009 (CCP (2009)) for T&TEC, and its proposals for a revised CCP.

1.2. Structure of this Consultative Document

The remainder of this document is divided into four (4) sections.

Section 2 presents the background on the development of the CCP (2009).

Section 3 discusses the key tenets of the CCP (2009) and presents the RIC's proposals for amendments to the policy document.

Section 4 presents other matters for consideration.

Section 5 presents a summary of the major changes proposed.

1.3. Responding to this Consultative Document

All persons wishing to comment on this document are invited to submit their responses in writing, by post, fax, or e-mail, to:

Executive Director

Regulated Industries Commission
88 Queen Street, Port-of-Spain,
Trinidad.

Postal Address: P.O. Box 1001,
Port-of-Spain, Trinidad

Tel.: 1(868) 625-5384; 627-7820; 627-0821; 627-0503

Fax: 1(868) 624-2027

Email : ricconsultations@ric.org.tt

All responses will normally be published on the RIC's website unless there are good reasons why they must remain confidential. Any requests for confidentiality must be indicated. A copy of this document is available from the RIC's website.

The deadline for submission of comments is April 29, 2022.

2.0 BACKGROUND - DEVELOPMENT OF THE CAPITAL CONTRIBUTION POLICY

The Regulated Industries Commission (RIC) is the economic regulator of Trinidad and Tobago's electricity, and water and wastewater sectors. The RIC, in accordance with Section 6(1)(h) of the RIC Act No 26 of 1998, is responsible for establishing the principles and methodologies by which service providers determine rates for services. The RIC indicated in the 2006-2011 Final Determination[1] for the electricity sector, that it would investigate the treatment of CCs by T&TEC, having recognised that the CC to be paid by customers was a contentious issue because the calculation of the connection costs is complex and it was not readily explained to or understood by customers. Furthermore, and to some extent, the consideration of the connection costs appeared to be subjective on the part of the service provider. There were also concerns about the opportunity for some customers to "free-ride" or benefit at no cost to them, by connecting to infrastructure works paid for by other customers under the arrangements that were in place at that time.

Section 6(2) of the RIC Act, No. 26 of 1998, mandates the RIC to consult with all parties it considers as having an interest in matters before it. In accordance with this mandate, the RIC employed a consultative approach, in September 2006, to examine the treatment of CC by T&TEC. Consequently, a Capital Contribution Working Group (CCWG) was formed, comprising various stakeholders. The CCWG was established to review the relevant issues related to connection costs and CC and to propose recommendations for the treatment and administration of CC. The RIC considered the working group's findings and proposals, as presented in the "CCWG Report of March 2007", and prepared a consultative document which was circulated to the public. After review and consideration of the comments received the RIC prepared the document, "Capital Contribution Policy for the Trinidad & Tobago Electricity Commission - Final Decision, June 2008", which was approved by the Board of the RIC on January 30, 2009 (CCP (2009)). The CCP (2009) was issued to T&TEC on March 13, 2009, setting out the principles and methodology by which T&TEC would determine the CC to be paid by a customer. Implementation discussions were held with T&TEC to ensure that the tenets of the CCP were applied in an appropriate manner.

[1] Final Determination (Rates and Miscellaneous Charges) for the Regulation of Electricity Transmission and Distribution for the period June 01, 2006, to May 31, 2011.

The CCP (2009) was formulated to ensure that a fair and transparent policy was established for connections that require upgrade or extension to the local network and wider networks, and that T&TEC (and by extension the customer base), would not unduly subsidise this expense. The approach and methodology laid out in the CCP (2009) established that new customers would pay for electrical works that were not budgeted under T&TEC's forecasted network development (as per the Final Determination Document 2006) and that the CC cost would be calculated in a consistent and transparent manner.

The RIC addressed the following key areas of concern surrounding CCs in the CCP (2009):

- Point of Connection Definition;
- Pricing Principles for Capital Contributions;
- Charging Policy/Calculation of Capital Contribution Charges;
- Contestability of Customer-Funded Works;
- Reimbursement;
- Asset Ownership;
- Recognition and Valuation of Assets; and
- Dispute Resolution and Monitoring.

3.0 CCP (2009) REVIEW

The CCP was implemented in 2009, and following its implementation the RIC has met with T&TEC on several occasions to discuss various elements and to provide clarification on some areas of the policy. In general, the policy has worked well[2] in achieving the intended objectives. However, at this juncture, the RIC is of the view, given the passage of time, that it is necessary to evaluate whether the main tenets of the policy remain fit for purpose.

For this review, all critical elements of the CCP (2009) have been deliberated upon by the RIC, in accordance with best practice CC policies and strategies in other jurisdictions which utilise similar regulatory frameworks such the UK, Australia and New Zealand. The concerns about the principles and administration of the policy, and suggested amendments articulated by T&TEC and customers have also been considered by the RIC. For each key element of the CCP, a discussion is presented, followed by the RIC's proposals. The key elements are as follows:

- Pricing Principles;
- Payment of Capital Contribution and Connection Point, and Capital Contribution Calculation Method;
- Contestability;
- Reimbursement;
- Ownership of Customer Contributed Assets;
- Recognition and Valuation of Customer Contributed Assets;
- Dispute Resolution; and
- Monitoring of the CCP.

[2] According to the World Bank and the International Finance Corporation, as reported in the Doing Business 2014 - Understanding Regulations for Small and Medium-Size Enterprises, "A study of regulators in Latin America and the Caribbean found that Trinidad and Tobago's Regulated Industries Commission ranks highest in electricity governance. The Commission's strong push for reform of the capital contribution policy made it work".

3.1. Pricing Principles

The RIC established three (3) broad principles for CCs because a CC payment is essentially a network price or tariff paid up front. Therefore, the principles used to determine CCs should be consistent with the approach to establishing other network tariffs. The following principles currently apply:

1. Economic efficiency- that is, prices should reflect the economic costs of service, signal future investment costs, and should encourage productive and allocative efficiency[3]. Economic efficiency requires that the expected network revenue from the new customer must at least cover the incremental cost of supply. Prices send signals to customers regarding the cost of service provision so that these costs must be considered in usage decisions. Similarly, CC payments provide "locational signals" which help to guide network investment. If the costs of connection are hidden from the high-cost customer, cost-effective alternatives to connection may not be considered.
2. Promote equity, stability and consistency of outcomes - that is, by having regard to the impact of tariffs on customers and being consistent and transparent. In the absence of CC payments, certain connections may be uneconomic and would place upward pressure on average prices as existing customers would have to subsidise these customers. Avoiding the 'free rider' problem is also important, as the connection assets paid for by the first customer may be later shared with other customers seeking connections.
3. Cost recovery – that is, prices, as far as possible, should fully recover the costs of efficient operations. The price signals customers receive through the costs they are required to pay for network connection also play an important role in determining how efficiently the network system develops.

The above principles established by the RIC are consistent with electricity pricing principles, and they align with the objectives of the CCP; therefore, they should be retained. However, given the developments in renewable energy (RE) technologies and the Government's mandate to increase RE penetration in the market, the RIC will include the following as a principle.

[3] Productive efficiency is concerned with the optimal method of producing goods; producing goods at the lowest cost. Allocative efficiency is concerned with the optimal distribution of goods and services

- Discourage uneconomic bypass – that is, due consideration should be given to the possibility of consumers bypassing the network for an alternative supply. Thus avoiding a situation where CCs for grid connection of small RE systems[4] or large industrial customers, for example, are higher than stand-alone generation and storage.

Service providers typically adopt one of three (3) broad approaches to derive charges for connection to their networks. They are as follows:

- A "deep" connections policy - estimates the total costs that will be incurred as a result of connecting new load to the system, including the costs of all network reinforcement.
- A "shallowish" connections policy – estimates the connection assets, excluding the costs of reinforcement at higher voltage levels. Reinforcement costs are confined to the "local network" that is, the area close to the point of connection. Costs can include more general reinforcement costs if the party to be connected (connectee) is the main user of the asset.
- A "shallow" or "local" connections policy- estimates the cost of those assets that are required to connect a customer to the system, excluding the costs of extension and reinforcement of the distribution system. This type of connection only reflects the costs of providing the service line or cable necessary to connect a customer to the system.

A fourth approach has been used by a small number of service providers, where the costs of all the assets for a new connection are deemed to be part of the general system and are therefore recoverable from all users in the form of user tariffs or use of system charges, known as a "zero cost" connections policy.

3.2. Main Components of the Capital Contribution Policy

3.2.1. Payment of Capital Contribution and Connection Point (charging policy) and Capital Contribution Calculation Method

[4] A feed in tariff policy is currently being developed to accommodate the interconnection of small scale RE onto the grid.

Under the CCP (2009), the point of connection is defined as that point on the network where the use of assets changes from a shared basis to assets fully dedicated to a customer. The general rules and exceptions regarding the payment of CCs were outlined as follows:

- Customers are responsible for all connection costs up to the point of connection;
- The service provider is responsible for all other costs beyond the point of connection and is required to demonstrate that the connection is not commercially viable without that CC;
- A CC should be no more than the amount that would be required to make the extension commercially viable; and
- Augmentation assets will be required to be at the least cost and optimum size required.

Exceptions to the General Rules:

- **Commercial customers** are only required to meet the costs of augmentation works to the local network if provision has not been made for such works within T&TEC's price limits;
- Where the connection is for a large load customer, the terms for funding the connection, including the network augmentation costs (for both the local and remote network) to be paid up-front (if any) will be negotiated between the service provider and customer; and
- Where the connection is for a multi-occupant development (i.e. a multiple lot development), the developer will be considered as a single customer and will be required to fund all low voltage (LV) and high voltage (HV) assets required to connect that development, once they are for the exclusive use by the development. If these assets can be shared by customers outside the development in the vicinity of the building, the following will apply:
    1. For single-phase HV spur line extensions from the network to the development/building, T&TEC is responsible for extension up to the development.
    2. For 2 or 3-phase HV line extensions from the network to the development/building, the developer shall pay two-thirds (2/3) of the full cost of the HV assets.
    3. The developer shall pay the full cost of the electrical infrastructure within the development.
    4. The owner of a multi-occupant building will, in instances where there are five (5) or more metered accounts (regardless of the customer classification) or two (2) or more non-domestic accounts in the building, be classified as a developer and will be

responsible for all costs associated with making an electricity supply available to the building.

The classification of owners of buildings with multiple meter bases is outlined in table 1 below.

Table 1: Classification of the owners of buildings with multiple meter bases

COMBINATION OF METERS (classified by Tariff Class)[5]	**CLASSIFICATION OF OWNER**
2 Rate A accounts 3 Rate A accounts 4 Rate A accounts 1 Rate A and 1 Rate B account 2 Rate A and 1 Rate B account 3 Rate A and 1 Rate B account	Owner is not classified as a developer. Capital Contribution Formula will be applied.
2 or more non-domestic accounts 5 or more accounts (any classification)	Owner classified as a developer. Required to pay the full cost of capital works.

The RIC established a "shallowish" approach for connection charging for Rates A to D4[6] customers and implemented an incremental approach to calculate CC payments, where project costs will be confined to work on the local network. Currently, the following formula applies to these customers:

$CC = IC - IR_{(n=10)}$

Where:

CC = Capital Contribution
IC = Project Costs (Capital Costs associated with the connection)
$IR_{(n=10)}$ = Incremental Revenue (present value of a 10-year revenue stream directly attributable to the new connection (calculated using a discount rate that is equal to the cost of borrowing allowed in the price limits).

[5] Rate A customers are classified as "All domestic and household electricity supplies for use by one family living in one residence, supplied from one meter."
Rate B customers are classified as "Electricity supplies for purposes other than domestic and household in a single installation supplied from one meter."
[6] A- Residential, B- Commercial, B1- Commercial, D1- Small Industrial, D2 - Medium Industrial, D3- Large Industrial, D4 – Large Industrial.

Therefore, with the incremental approach, the customer pays a CC when the present value of the future revenue stream from the connection is insufficient to cover the cost of the connection.

For the very large industrial customers (i.e. D5, E1 to E5)[7] a deep approach was adopted, as such these customers bear the full capital costs of connecting to the network, that is, the associated connection costs as well as all augmentation costs (costs of the local network as well as the remote network). Also, the project costs, for all customer categories, only include the capital costs of the assets associated with the new connection. All recurrent costs (maintenance and operation) are to be recouped through the tariffs.

3.2.1.1. Discussion and Proposals for the way forward

In its review, the RIC has found that the application of a "deep" vs. a "shallowish" charging policy, and the calculation of the quantum of CC to be paid are the most contentious areas of the policy.

Payment of Capital Contribution and Point of Connection (Connection Charging Principle/Policy)

Regarding the connection charging principle/policy, concerns arise as to which charging policy should apply to which customers and, by extension, which costs should be borne by the customer requesting a new or upgraded connection versus which costs are to be borne by the wider customer base. What constitutes "dedicated supply" costs versus "augmentation or reinforcement costs" and how these are to be shared (if at all) are also issues of importance to clarify. These are critical matters that depend on the charging policy because if the allocation is not properly balanced, an inappropriate element of the cost burden of connecting new properties falls onto one party or the other. Further, in practice, it is difficult to clearly distinguish between capital works provided for specific customers and those that cover future growth expectations or general reliability or safety improvements. Indeed, when the connection of one or more customers necessitates upgrading a part of the existing infrastructure, it is difficult to determine the extent of the liability of each new customer for the additional infrastructure works.

[7] D5- Large Industrial- Standby, E1- Very Large Load, E2- Very Large Load, E5- Very Large Load

Concerns with respect to the calculation of the quantum of the CC relate to the specific methodology for its calculation and the use of an appropriate formula where applicable. It is to be noted that the choice of charging policy and the method to calculate the quantum of CC payable are not mutually exclusive.

T&TEC has proposed that all customers who require a "dedicated supply" pay the full cost of any system augmentation required, whether local or remote. In this instance, "dedicated supply" will refer to those distribution service connections where a transformer and/or other high voltage equipment is dedicated to a specific customer (not able to be shared with other customers). To make its case, T&TEC has identified several instances where customers in lower rate classes (A, B, D1 and D2) requested a supply and no other customer was able to benefit. In those cases, the works done by the Commission is solely for the benefit of that particular customer. T&TEC has proposed that those customers whose supply is considered dedicated (solely for their use) should pay full cost as no benefit is passed onto the shared network grid.

In order to fully consider the nuances related to the application of an appropriate charging policy, the RIC examined the mechanisms utilised in other jurisdictions where these concepts are applied. The treatment of dedicated assets for all customer classes is explicitly stated within the connection policies of Australian utility companies. Connection services are separated into three distinct services; (1) basic connection service, (2) negotiated connection service and (3) enhanced connection service. Customers requesting basic connection services (residential, small business customers and small embedded generators) do not pay any CC. Negotiated connection services are generally more complex and are more likely to require augmentation or extension of the network. Where the estimated costs of a new or altered connection exceed the estimated revenue, the connection applicant may be required to contribute toward the costs of the premises connection assets and any required network extensions. A shared network augmentation charge may also apply where the customer's estimated maximum demand exceeds defined kVA thresholds (see Appendix B). For enhanced connection service a full cost recovery charging methodology is applied to the above standard and/or special connection requirement components of the connection (i.e., no incremental revenue rebate is applied to this component of the costs). Requests for a connection service that has increased reliability standards, dedicated assets and upgrades from

overhead to underground service assets are some of the services that are considered to be enhanced connection services.

Vector Electricity (VE) is a distribution utility in New Zealand that does not utilise the incremental approach for its determination of CC for customers requesting new connection services. Its policy for determining CC states that distribution prices are set to recover the costs of owning and operating the electricity distribution network as it currently exists.[8] VE requires a connection applicant to pay a CC when any additions to the electricity distribution network are required to provide new connection services or sole use assets. The additions considered are specifically a dedicated connection, sole use assets and in some instances, other costs that would be avoidable from Vector's perspective, but for the customers' requirements. Avoidable costs are those costs that VE would incur from augmenting the electricity distribution network that VE would not otherwise face 'but for' the new connection or sole use assets. Avoidable costs may relate to (a) assets for use only by the connection applicant or consumer, and the associated costs (connection and sole use costs), and (b) wider system assets used by the connection applicant as well as other consumers, and the associated costs (shared costs). Where the avoidable cost relates to shared costs, VE determines the avoidable cost with reference to the connection applicant's allocated share of actual capital expenditure in shared assets required to provide new connection services; and/or the connection applicant's allocated share of upstream augmentation.

The charging methodologies in New Zealand and Australia are different, however, there are distinctions in connection charging in both jurisdictions based on the complexity of works required and/or extent of customers' supply requirements. The RIC is also mindful that in many jurisdictions adjustments to CC policies are often made simultaneously with overall network planning decisions and user rate determination exercises, so a good balance is struck between user charges and CCs. For example, the most recently approved connection policy for SA Power Networks in Australia is approved by the Australian Energy Regulator in its distribution determination and it remains in force for the entirety of the Regulatory Control Period. In other territories where distribution prices are only sufficient to recover a portion of the cost, particularly concerning any new assets, CCs are used to "fill the required revenue gap".

[8] Please see Vector Electricity's Policy for determining capital contributions on electricity distribution networks, Effective 1 February 2020.

Ofgem applies a "shallowish" connection boundary to customers connecting to the distribution network. This means that in general, the connecting customer pays for:

- All of the costs for the extension assets required as part of their connection; and
- Some of the costs for any network reinforcement required to facilitate their connection.

The contribution towards reinforcement (and what is paid by the connecting customer versus what is funded by the network company and recovered through Distribution Use of System (DUoS) charges) is determined by detailed rules which are set out in the relevant charging methodology. Where a new connection triggers reinforcement, the connection customer contributes to work at the same voltage as the point of connection, plus the one above. The Distribution Network Operator (DNO) fully funds any reinforcement at two (2) voltage levels above the voltage at the point of connection. This reflects that reinforcement at these levels is likely to provide a shared benefit to a wider group of users. This is referred to as the "voltage rule". The apportionment of reinforcement costs between connection customers and the DNO is determined using two Cost Apportionment Factors (CAFs). The Security CAF and/or the Fault Level CAF are used depending on what is driving the need for reinforcement (network or fault level capacity). This ensures that the connection customer's contribution is proportionate to their share of the new network capacity being provided.

As indicated in Section 3.1 charging policies are classified as follows:

- "Deep" connections policy – the customer pays the total costs that will be incurred as a result of connecting new load to the system, including the costs of all network reinforcement.
- "Shallowish" connections policy – customer pays the cost of the connection assets, excluding the costs of reinforcement at higher voltage levels. Reinforcement costs are confined to the "local network" that is, the area close to the point of connection. But costs can include more general reinforcement costs if the connectee is the main user of the asset.
- "Shallow" or "local" connection policy – Customers pay those assets required to connect a customer to the system, excluding the costs of extension and reinforcement of the distribution system. Consequently, this type of connection only reflects the costs of

providing the service line or cable necessary to connect a customer to the system. Hence, it is called a "shallow" or "local" connections policy.

- "Zero cost" connection policy - where the costs of all the assets for a new connection are deemed to be part of the general system and are therefore recoverable from all users in the form of user tariffs or use of system charges. Few utilities utilise this approach.

Generally, to connect the customer to the existing network requires "extension assets" and, in some cases, increasing the capacity of the existing shared network assets or "reinforcement assets" (sometimes referred to as "augmentation assets"). Alternatively, certain customers may only require "extension assets" while other connections may require no "extension assets" but only "reinforcement" assets. The way these costs are split overall is dependent on the depth of the "connection charging boundary". Customers facing a deep connection boundary fund all of the required cost of reinforcement whereas, under a shallow boundary, the service provider would fully fund such work and recover it from all consumers through its tariffs.

Under a shallowish approach, "extension assets" are paid for by the customer, and "reinforcement costs" are shared. A service provider, depending on the regulatory environment within which it operates, may apply different approaches for different categories of customers or apply a general policy for a particular customer class and create exceptions to that rule within that class or classes of customer/s, depending on the nature of the customer's request, as in the case of requests for "enhanced connection service" in Australia, where full costs are levied on the customer (associated with a deep connection). Further, the issues of the sharing of costs related to reinforcement or augmentation can be linked to certain technical and other criteria as in the case of Ofgem or the application of specific principles like avoided costs as seen in New Zealand.

In the 2009 CCP, RIC employed a "shallowish" charging policy for customers across rate classes A to D4 and utilised a "deep" charging policy for very large industrial customers (i.e. D5, E1 to E5). The RIC, as noted previously, established certain general rules. Under these rules, the customers are responsible for all connection costs up to the point of connection as defined by the policy. The point of connection is the point where the use of assets changes from a shared basis to assets fully dedicated to a customer (or a set of customers); essentially, this meant that the customer was responsible for all "extension costs" and that the service provider was responsible for "reinforcement" or "augmentation costs." An exception was created such that, commercial

customers would only be required to meet the costs of augmentation works to the local network if the provision had not been made for such works within T&TEC's price limits. The issue of the "sharing" of reinforcement (augmentation costs) in the absence of regular price reviews is a source of concern. Moreover, T&TEC's proposal to utilise the term "dedicated assets" without relating this especially to the point of connection definition, does not provide clarity as to the criteria to be used to determine what constitutes "dedicated assets" and consequently dedicated costs when dealing with reinforcement or augmentation assets.

The RIC has considered the above and is of the view that the application of a single approach to cost charging for customers across rates classes A to D4 that require varied connection services and consume electricity at varying quantities needs revisiting. Indeed, it is often difficult to predict the growth requirements of these classes of customers. The RIC is also mindful that where price reviews are not conducted at regular intervals, the current user tariffs would not be reflective of the cost of construction and maintenance of the new assets. The RIC has also specifically noted that in certain jurisdictions such as Australia, the use of the shallowish approach is confined to domestic and commercial customers and not deemed appropriate for industrial customers. Consequently, the RIC proposes to have D1 – D4 customers fully fund the cost of their connection, as determined by T&TEC, inclusive of all augmentation works (i.e. all augmentation costs, local and remote network), in accordance with a "deep" connection charging policy that already applies to other industrial customers.

Comments are invited on the proposal to apply a "deep" connection charging policy for D1 – D4 customers as is the case with other industrial customers.

It is proposed that the "shallowish" approach will continue for domestic and commercial customers. In this regard, and in keeping with the existing policy, as a general rule, customers will be responsible for all connection costs up to the point of connection. This means that these customers will continue to be responsible for all "extension" costs. The RIC is mindful that under the existing CCP, these customers would only be required to meet the costs of augmentation (reinforcement) works to the local network if provision has not been made for such works within T&TEC's price limits, or in the case of developers where those costs would have benefitted those

outside the development. However, the RIC understands the predicament that befalls the service provider in the absence of on-time price reviews and the difficulties in determining the extent to which other customers will benefit. The RIC, therefore, proposes the implementation of an avoided cost principle (avoidable costs are the costs that T&TEC would incur from reinforcing/augmenting the network that T&TEC would not otherwise face 'but for' the new connection) as the principle to be used when determining which party (service provider or customer) should pay for what reinforcement costs.

Comments are invited on the proposal to apply the avoided cost principle as the basis for sharing "reinforcement (augmentation)" costs to A, B and B1 customers (inclusive of multi-occupant developments).

Capital Contribution Calculation Method

The RIC has noted that certain Australian utilities employ a full cost recovery charging methodology to non-standard and/or special connection requirement components of the connection (i.e., no incremental revenue rebate is applied to this component of the costs). Requests for a connection service that has increased reliability standards and/or upgrades from overhead to underground service assets (which are at the request of the customer) are some of the services that are considered to be enhanced connection services. The RIC considers that there is merit in creating an exception to the general rule for enhanced connection services as network tariffs are based on an optimum configuration and hence efficient costs. It would be unfair for the wider customer base to bear these costs. T&TEC will be required to provide a listing of the services that are considered to be enhanced connection services for approval by the RIC.

Comments are invited on the proposal to apply a deep cost pricing principle (with no offset in revenues) for A –B1 customers applying for enhanced services.

The RIC notes that its definition for point of connection is in keeping with approaches employed in the UK, Australia and New Zealand[9] and will continue to employ the same along with its overall approach to multi-occupant developments (except where otherwise stated). The RIC also intends to continue with the exception that states "where the connection is for a large load customer, the terms for funding the connection, including the network augmentation costs (for both the local and remote network) to be paid up-front (if any) will be negotiated between the service provider and customer. However, this exception will now extend to all industrial customers who fall within a "deep" charging policy.

Capital Contribution Calculation Method

Where a "shallowish" approach is employed, consideration is often given to incorporating the revenue stream to be received from the customer in determining the actual or final CC to be paid. At the time of the formulation of CCP (2009), the RIC gave much consideration to how the final CC payment should be calculated and the variables to be used within the formula. In keeping with the recommendation of the CCWG, the RIC chose to employ an incremental approach. This approach estimates the marginal cost of connecting the customer to the network and nets off to the marginal revenues (over a particular time period) that the utility will earn from the connection to determine the final CC and thus sends appropriate pricing signals to both the customer and service provider.

Under the incremental approach currently employed, a customer pays a CC when the present value of the future revenue stream from the connection is insufficient to cover the cost of the connection. The cost includes both costs to the shared network and the costs of any dedicated network extension. Consequently, T&TEC can recover its capital outlay for the customer's connection over the ten-year recovery period established by the RIC. This approach is in keeping with the principle of economic efficiency, as stated above, which requires that the expected network revenue from the new customer must at least cover the incremental cost of supply, inclusive of dedicated assets.

[9] In the absence of documented CCPs among regional utilities/regulators, the CCP (2009) considered CC practices in these jurisdictions. These jurisdictions were chosen because they employed incentive frameworks for pricing which were similar to the framework being adopted in Trinidad and Tobago at the time.

New Zealand's Main Power utility also applies the above principle. The incremental costs for determining CCs include the cost of assets dedicated to connecting the customer to the point of connection. However, its policy only applies to residential and commercial customers. Its policy states that, "the application of the incremental formula to customers qualifying for large user group status will be subject to the approval of the Network Manager and therefore has been excluded".

The experience of New Zealand gives further credence to the RIC's proposal to employ "deep" charging for all industrial customers and limit domestic and commercial customers to a "shallowish" approach while employing the principle of avoided cost to determine how reinforcement or augmentation costs should be shared. This determines the project costs to be used within the formula. The issues of the length of the revenue stream and what should constitute the actual revenue stream to be employed are also important. While both can be treated separately, they must complement one another.

T&TEC has raised concerns about the formula for calculating CCs under the incremental approach and has presented variations to the formula for consideration. T&TEC has also interrogated the use of a ten-year revenue stream for incremental revenue and has contended that incremental revenue should reflect a revenue stream that is net of incremental costs such as fuel cost. Further, T&TEC contends that the revenue stream should be confined to incremental revenue (net of fuel costs).

The RIC's decision to use a ten-year period for the incremental revenue was a middle ground between the recommendation of the Capital Contribution Working Group and the longer timeframes observed in other jurisdictions that utilised the incremental approach. The time frame for the revenue stream within the formula should usually adhere to the principles that underlie tariffs/rates for long-lived assets. As such, the "pay-back" period is often spread over a long period, typically between fifteen (15) to forty (40) years in keeping with assets lives that are evaluated on "used and useful" criteria. Examples of these are shown in the undermentioned table 2.

Table 2: Key features of the Incremental Revenue Approach for Capital Contribution in other Jurisdictions

Country	Utility/ Regulatory body	Length of Revenue Stream	Incremental Cost	Incremental Revenue
New Zealand	Main Power Policy effective date 5th September 2018	40 years (residential and small business) The number of years: represents the anticipated economic life of the "extension" assets. For the purpose of the formula, this is assumed to be 40 years, unless the useful life is known to be less.	The total cost of "extension" includes both lines and other equipment. These costs typically relate to dedicated assets solely used by the customer but may also relate to assets that may be shared (e.g. transformers). These assets are generally costed to recover direct internal design and planning costs and supplier quoted rates.	Refers to the distribution revenue
Australia	AusNet Services Policy effective date 1st July 2021	30 years for Residential Customers Commercial and Industrial 15 years	The total cost includes both the incremental costs incurred that are specific to the connection, such as network extension assets and augmentation of connection assets at the premises) and incremental cost of the shared network.	Refers to the distribution revenue
Australia	SA Power Networks Policy effective 1st July 2020	30 years residential 15 years for non-residential	The incremental costs incurred by SA Power Networks for connection services, which are solely used by the connection applicant. This cost typically includes the cost of extension assets, administration (including preparation of an offer for a negotiated connection service), project management, design, easements, certification and inspection, carrying out a tender process, or assisting a connection applicant to conduct a tender process and the cost of any required reimbursement.	Refers to the distribution revenue
Australia	Energex Policy effective 1st July 2020	30 years for residential customers 15 years business customers	The incremental cost includes costs incurred by Energex that are specific to the connection, such as costs of providing or augmenting any connection assets at the customer's premises; costs of any dedicated network extension; administration costs (including design and certification costs); costs of providing any other standard control services which are used solely by the customer; and tender costs (where applicable) and network costs incurred by Energex as a result of the new or altered connection, but which are not specific to the connection, such as network augmentation (other than an extension beyond the standard service line).	Refers to the distribution revenue

In addition to the timeframe for the revenue stream, the RIC has examined the other elements of the incremental approach formula to determine if they remain fit for purpose. Currently, the formula is used to access the economic viability of the project (the connection) and considers a customer's revenue stream based on the applicable kWh and kVA rates and the customer's consumption versus the project cost. As shown in table 2 above, incremental "distribution revenue" is used for calculating CC payments under the incremental approach utilised by utilities in both Australia and New Zealand. However, it is important to note that in both of these countries, the sector is structured, such that, there are distribution utilities, and thus the revenues attributable to them are easily identifiable.

In the local context, distribution revenue would be calculated by subtracting specific costs, including the fuel costs associated with the customer's usage, from the total incremental revenue. Since T&TEC's user charges reflect the overall cost of service, a methodology would have to be developed to appropriately allocate the share of user charges that is attributable to fuel costs for the adjustment to be made. Moreover, there is the added difficulty of determining the apportionment and how it should be operationalised as the cost structure of T&TEC (fuel and conversion versus other costs) has changed over time. For example, these costs accounted for seventy (70) percent of T&TEC's costs at the time of the last price review, but now account for approximately fifty (50) percent of the costs.

The RIC has carefully considered the above and is of the view that the current formula strikes an appropriate balance between the length of the revenue stream and the quantum of that stream. Although 10 years is not as long as what obtains in some jurisdictions, this is balanced by the use of an incremental revenue stream comprised of the full tariff, rather than only the distribution revenue. Therefore, it removes the need to develop a mechanism to split that revenue stream, which may be an added complication. The RIC believes that a revenue stream of 10 years conforms to the overall methodology (for a relatively long revenue stream to be utilised for long-lived assets) and proposes to maintain the 10-year revenue stream comprised of the full tariff.

Comments are invited on the RIC's proposal to continue utilising a ten-year revenue stream comprised of the full tariff.

In respect of multi-meter arrangements, T&TEC has indicated that a customer who requests that fewer meters be installed than the number of meter bases, as per the customer's splitter arrangement,[10] it is unduly disadvantaged. T&TEC has requested that in such a case, the costs for the infrastructure to accommodate the full and final anticipated supply will be applied and netted off against the anticipated revenue for the final number of meters requested to be installed at the time. The RIC wishes to stress that under the existing policy a customer is responsible for all costs up until the point of connection (extension costs) and full reinforcement costs where the relevant assets are unlikely to be shared with customers outside the development. If these assets are likely to be shared, the service provider would bear some of these costs. Hence, these are the project costs to be applied, and these costs are independent of a decision by the customer to phase in tenants. The issue of the revenue stream to be utilised requires careful consideration. The RIC understands that T&TEC is concerned that it is best to consider only the "final number of meters requested and to be installed at the time" because the revenue stream may not materialise. However, it can be argued that if the project costs include the cost of making a certain capacity available, then the anticipated revenue stream should accord with this. Thus, the RIC is of the view that the revenue stream should be based on the anticipated number of customers. The matter of shortfall in revenue will be dealt with separately in the section that follows.

Comments are invited on the treatments outlined for connection applicants for multi-occupant buildings.

3.2.1.1.1. Shortfall/Defaults in Incremental Revenue/ Under-recovery of T&TEC's Capital Outlay for Customer Connection.

The RIC is mindful of situations where T&TEC's incremental revenue, generated by the sale of electricity to new industrial or commercial customers, has fallen short of the projected amount in the calculation of CC charges due to the following main reasons:

1. Less than projected electricity consumption, and in some cases zero consumption, and
2. Requests to reduce the contracted reserve capacity or amend the customer classification for large commercial and industrial customers.

[10] As initially requested by the customer and on which the conditions of supply were based.

The above situation results in outlays of capital to install infrastructure by T&TEC, which are not recovered over the stipulated period due to the shortfall in the amount of incremental revenue actually collected from the customer.

In the current circumstances, the RIC's view has been that as a general principle, the following applies: if the incremental revenue stream of a customer within the recovery period is less than was forecasted, the customer should be liable for meeting the incremental costs for connecting to the network.

The provisions included in CCPs, to treat with similar circumstances, have varied by jurisdiction, however, three (3) of the observed approaches are as follows:

1. Financial Guarantee - customers are required to provide the utility with a financial guarantee, which secures the utility a certain level of revenue in relation to the augmentation that the utility has funded for the customer's benefit.
2. Security Fee - customers are required to pay a security fee that is capped at the amount of incremental revenue that is assessed as being at risk. The fee will not exceed the present value of the connection cost. An annual rebate of the security fee will be provided when the customer's actual electricity use is verified.
3. Reduced demand payment - the utility may recover a reduced demand payment if a customer gives notice to reduce the contracted capacity at a contracted point; or terminate the user's access contract, within the cost recovery period, such that the user's access charges are reduced; and no other user is likely to pay access charges in respect of that contracted point within the cost recovery period.

The approaches mentioned above attempt to secure the utility's revenue stream and apply to commercial and industrial customers. The approach outlined in three (3) above will not be effective in cases of insolvency and where the customer cannot pay the reduced demand fee. The RIC is mindful that under its current proposals the recovery of the shortfall in incremental revenue will no longer be an issue in respect of industrial customers as the RIC proposes to implement "deep" connection charging. However, the issue remains one that will affect commercial customers as residential customers are not usually required to provide a financial guarantee of any sort to the utility.

The RIC recognises that the requirement to pay a large upfront fee for a connection may be prohibitive for some customers. The RIC proposes to amend the CCP to ensure that T&TEC's incremental revenue stream is secured and it can recover its capital outlay for a commercial customer's connection. Since T&TEC has expressed the greatest concern when customers have completely fallen off the network, an upfront requirement may best secure the utility's revenue stream. The RIC understands the requirement of a financial guarantee may be onerous for commercial customers and a reduced demand payment is unsuitable as these customers do not contract capacity. The Security Fee may thus be the best option in the circumstances.

Comments are invited on the RIC's proposal to address the shortfall/defaults in incremental revenue.

3.2.2. Contestability

The RIC's intention to introduce contestability[11] into the CCP (2009) was to create a level playing field for works that required a CC to be made contestable, wherever possible. The introduction of contestability into the CCP was important to erode the potential for monopoly abuse, and thereby ensure that benefits are accrued to customers as a result of competition.

The contestability provision allows customers to have the option of using either T&TEC's or contracted labour for capital works associated with their connection to the network. T&TEC is responsible for preparing a list of prequalified contractors from which customers can choose. T&TEC is also responsible for specifying the technical criteria to which these contractors must adhere and informing customers about the average costs of undertaking works in various geographical areas. Since the electricity market structure has not changed, contestability remains a necessary component of the CCP.

In its review, the RIC has found that the contestability principle has not been executed as intended. There were many instances where customers were not presented with the option of selecting a certified contractor when the option should have been made available given the nature of the works

[11] Contestability – refers to works where the customer has a choice of utilizing a private contractor.

to be done. Also, in operationalising the CCP, T&TEC limited contestability to greenfield works, confining the customers' ability to select a certified contractor for "hotline" works. T&TEC's approach to limit contestability may be valid to reduce coordination efforts between itself and certified contractors. However, it may be in customers' best interest to extend contestability to projects where a CC is being paid, even if greater collaboration and coordination between T&TEC and certified contractors may be required to ensure safe operations.

T&TEC must make a strong case for the RIC's approval before contestability is restricted for greenfield or hotline works when competent contractors are available to undertake such works to address the situation described above. T&TEC must also be consistent in presenting customers with the option of selecting a certified contractor when the option is available, given the nature of the works that are to be done.

Comments are invited on the contestability provision.

3.2.3. Reimbursement

A reimbursement/rebate scheme is often included in policies similar to the CCP (2009) to avoid a "free-rider" problem where customers who connect to the network can utilise assets, paid for by another customer, free of charge. It ensures that all customers share in the total cost of the infrastructure. When a customer obtains a connection to the network using assets that another customer-funded, the latter customer is required to fund a portion of the cost of those existing assets, and the contribution is reimbursed to the original customer.

The CCP (2009), specifies circumstances when a customer is entitled to be reimbursed. The scheme limits reimbursement within industrial or commercial classes, but not by residential customers, as industrial and commercial customers are in a position to capitalise the original CC expenditure. However, nothing precludes reimbursement within customer classes. Original Rate A and B customers (i.e. those using up to 50 kVA) are reimbursed based on a simple apportionment among the potential number of customers). Reimbursements do not apply in cases of multi-lot developments.

Under the current policy, the period over which reimbursements may be offered is limited to six (6) years. Total reimbursements are credited to the property account and are limited to the amount of the original CC adjusted for inflation. Where T&TEC did not carry out the capital works (i.e. where the customer employs the services of a certified contractor), T&TEC must apply charges as if it had completed the work itself. The original customer is reimbursed only when a new customer(s) has paid all the amounts due and has been connected to the supply. Also, T&TEC's administrative costs for establishing and administering the reimbursement scheme are recovered through network charges.

The RIC has found no major issues with T&TEC's administration of the scheme in its review. However, there have been minor queries regarding the application of the reimbursements scheme in the event of the death of the "person" who paid the original CC or in the case that the account has been transferred to another person. The RIC's view is that reimbursements should be applied to the account of the premises and not to a person under the circumstances above.

In the jurisdictions[12] researched, the period over which reimbursements are offered under CC policies ranges from five to fifteen years. In some cases, reimbursements have been restricted to customer contributions over a specific value, thereby reducing the administrative responsibility of the utility. Another noteworthy observation of reimbursement schemes in other jurisdictions is that in the case of failure of a contributed asset during the reimbursement period, the customer is not entitled to a reimbursement. However, given that contributed assets are not sourced by customers, it would be unfair to deny a customer reimbursement if an asset fails. If the utility replaces a failed asset, it forms part of the Regulatory Asset Base (RAB).

The RIC's position is that the reimbursement scheme under the CCP remains fit for purpose. It is proposed that the following be included in the policy document for clarification:

- Reimbursement entitlements of T&TEC's three (3) main customer classifications, which apply by extension to the respective sub-classifications, are clarified in table 3 below.

[12] Australia, New Zealand and United Kingdom.

Table 3: Reimbursement Entitlements of T&TEC's three (3) main customer classifications

Original Contributor	May be eligible for reimbursement from
Domestic Customer	Domestic Customers Commercial Customers Industrial Customers
Commercial Customer	Commercial Customers Industrial Customers
Industrial Customer	Industrial Customers

- Reimbursements will not apply in the case of multi-occupant developments and multi-occupant buildings except if customers external to the development/building will benefit from the system augmentation works.
- Reimbursements will apply when an individual within a multi-occupant development is required to make a CC for the connection.

Comments are invited on the reimbursement scheme for capital contributions.

Under the current CCP contributed assets are vested in the service provider to avoid customers having the responsibility for maintenance and replacement of these assets. This treatment of contributed assets is customary among the jurisdictions researched.

The RIC proposes to maintain this treatment of contributed assets where T&TEC will own all the connection assets and network service assets that have been funded by CCs, regardless of whether the CC is made by the customer as a financial payment or as a contributed asset.

Comments are invited on the treatment of customer contributed assets.

3.2.5. Recognition and Valuation of Customer Contributed Assets

The recognition and valuation of contributed assets are a feature of CCPs that articulate how contributed assets are to be treated in terms of ownership and valuation. Contributed assets are also treated as part of the Regulatory Asset Base (RAB) to calculate depreciation charges to ensure replacement, but not for the calculation of a return on capital since the service provider does not pay for the assets. In terms of valuation, contributed assets are being treated no differently than other assets owned by T&TEC in terms of the valuation method used, as contributed assets are indistinguishable from other assets in terms of responsibilities and risks.

T&TEC or any other stakeholder has not contested the current recognition and valuation of contributed assets. Therefore, the RIC is of the view that the principle should be retained as it remains fit for purpose.

Comments are invited on the recognition and valuation of customer contributed assets.

3.2.6. Dispute Resolution

The CCP (2009) provides several options for customers and T&TEC to seek recourse in the event of a dispute. All customers have access to the dispute resolution process as approved by the RIC under the "Codes of Practice for T&TEC". Furthermore, either party can provide the RIC with written details of the complaint to facilitate resolution in accordance with the provision of the RIC Act. Additionally, T&TEC or the customer has the right to refer the matter to an independent body for either mediation or arbitration. To facilitate monitoring of the CCP, T&TEC is required to report to the RIC details of disputes, including information on the nature of the dispute, method of resolution and outcome.

From 2010 to the present, the RIC has received thirty-four (34) complaints related to CC and twelve (12) complaints specifically related to reductions in reserve capacity which affect T&TEC's ability to recover capital outlay for customer connections. All complaints received by the RIC have been resolved. The RIC proposes to maintain the above-mentioned options for dispute resolution under the CCP.

Comments are invited on the adequacy of the options available for dispute resolution under the CCP.

3.2.7. Monitoring

Monitoring and evaluation are essential to any project or programme. Through this process, organisations collect and analyse data, and determine if a project/programme has fulfilled its goals. The RIC intends to implement a more stringent and comprehensive monitoring of T&TEC's administration of the revised CCP (2009), given the proposed changes to the policy and the movement to deep charging and full cost recovery to an expanded number of customer classes. To improve the level of monitoring of the CCP, the RIC proposes that T&TEC be required, but not limited, to report the following information to the RIC by distribution area on a biannual basis:

a. the technical scope of CC works executed, disaggregated by project;
b. the cost to T&TEC disaggregated by project;
c. the time taken to complete the works and any breaches of the respective QSS;
d. the capital contributions paid, disaggregated by project;
e. the collection and remittance of reimbursement payments;
f. the details of disputes including information on the nature of the dispute, method of resolution and outcome;
g. The number of jobs done by certified contractors, and by T&TEC in-house crews; and
h. The number of new customer accounts added that paid a capital contribution.

Comments are invited on the RIC's proposal for monitoring the administration of the CCP.

4.0 OTHER RELEVANT MATTERS FOR CONSIDERATION

4.1. Policy Scope

In the CCP (2009), a CC is defined as a financial contribution made (or the equivalent in the form of assets) by a network user associated with designing, constructing, installing, and commissioning the electricity network assets of a service provider. Based on the above definition of CC, the scope of the policy appears broad. However, the current policy only addresses CCs to be paid for new or modified connections.

Research has revealed that CCPs in some jurisdictions[13] have advanced to accommodate additional scenarios where CCs may be required from a customer. These include requests for alterations to existing network assets such as customers' requests for relocation of poles and undergrounding of overhead lines.

The T&TEC Act outlines the manner in which customer-initiated requests for the removal of network infrastructure are to be treated when the request is made by the owner of the property. The RIC will maintain the current scope of the CCP (2009), and it will be explicitly stated in the revised policy document.

The CCP will address possible CCs to be paid by customers for the following customer-initiated requests:

1. New connection points (including for small embedded generation[14]), and
2. Alterations to existing connection points that require network upgrades or extensions of existing network assets.

Comments are invited on the scope of the CCP.

[13] Australia and New Zealand.
[14] Discussed in section 4.5 below.

4.2. Underground Infrastructure in Developments

The CCP (2009) makes no distinction between overhead or underground infrastructure. As such, the costing methodology in the CCP can be universally applied to overhead or underground infrastructure.

T&TEC has supplied data to the RIC showing that the requests for underground infrastructure from both private developers and government housing developments have cost T&TEC significant sums even though the infrastructure constructed was considered to be dedicated to those developments. T&TEC has proposed that all applications for supply via underground infrastructure be treated similarly to applications for overhead supply. Therefore, all requests pertaining to supply for developments via underground infrastructure will attract full costs.

There is currently no legal requirement that mandates underground assets for new developments. However, customers should be informed about the cost implications of infrastructure and be allowed to decide on the type to be installed for their connection. The cost methodology outlined for multi-occupant developments should be applied to both overhead and underground infrastructural works.

Comments are invited on whether the cost methodology outlined for multi-occupant developments should be universally applied to overhead and underground infrastructure.

4.3. Disclosure of Costs (including Third-Party Costs)

T&TEC has indicated that there are costs that are often indirectly related to the customer's request for a supply and which are paid to a third party by T&TEC. The RIC proposes that such costs are to be borne by the customer. Further, T&TEC's CC letters to customers should provide details on the computation of CCs, inclusive of material, labour, transport costs, and third-party costs and should refer to the prevailing CCP.

Comments are invited on the requirement for T&TEC's disclosure of all costs associated with a customer's request in its correspondence (Capital Contribution Letter) to the customer.

4.4. Connection of Small Scale Distributed Renewable Energy Generation Systems

The Government's plans for renewable energy integration will impact the distribution network since small-scale generation capacity will be embedded into the distribution network. The application of charging principles associated with the connection of small-scale embedded generation systems to distribution networks can be a major factor in the commercial viability of the impending small embedded generation scheme. More precisely, a Feed-in-Tariff scheme is being developed to facilitate the integration of micro RE generation systems, with a minimum capacity of 0.5 kW and a maximum capacity of 200 kW.

Table 4 below shows the CC requirements for small embedded generators for utilities in Australia New Zealand, and the United Kingdom. The approach to determine the CCs for micro-distribution generators varies by jurisdiction. However, each jurisdiction has distinguished the CC requirements based on the connection characteristics and/or the cost to connect the system. In the local context, similar specifications will need to be developed. In the circumstances, the RIC believes it is prudent to convene a working group on this issue before establishing a policy for small-scale RE.

Table 4: Connection Charging for Small RE Generators in Selected Countries

Country Utility/ Regulator	Policy Document (Effective Date)	Micro generators Size restriction	Connection charging for Micro generators
Australia Powercor	Connection Policy (01 July 2021)	1. Micro-embedded generator - inverter capacity of less than 5kW single phase, or less than 30kW for a three-phase connection. 2. Inverter capacity greater than 5kW single phase or 30kW for a three-phase connection	1. Considered a Basic connection A fixed fee is charged for basic connection services. The applicable fee depends on the connection characteristics, such as whether a current transformer is required (typically required for loads between 100-170 amps). These fees are approved by the AER and published in the General Service Charge Pricing Schedule. 2. A CC is only payable where the connection cost exceeds the revenue expected to be derived from it. Incremental revenue is calculated as the present value of expected distribution revenue over 30 years (residential) or up to 15 years (non-residential).
Australia AusNet Services	Distribution Connection Policy (31 March 2017)	1. Less 4.6 kW in the case of single-phase connections. 2. Greater than 4.6 kW in the case of single-phase connections	1. Customers requesting a micro embedded connection will either already have an existing connection service or will request a connection service and pay the relevant service fee for connection to the distribution network. 2. The CC for embedded generators that are also load customers will be calculated based on the total cost of the works required to support both the generation (expected electricity output) and load components of the connection service.
New Zealand Unison	Capital Contributions Policy (05 September 2021)	1. Urban - Residential Distributed Generation 2. Rural- Residential Distributed Generation	1. Standard Capital Contribution 2. Standard Capital Contribution The level of these contributions is determined in accordance with the policy and reviewed annually.

Country Utility/ Regulator	Policy Document (Effective Date)	Micro generators Size restriction	Connection charging for Micro generators
Ofgem	Access and Forward-looking Charges Significant Code Review: Consultation on Minded to Positions (30 June 2021)	All Distributed Generators	Customers connecting to the distribution network are charged under what is referred to as a "shallow-ish" connection boundary. This means that in general, the connecting customer pays for: • All of the costs for the extension assets required as part of their connection; and • Some of the costs for any network reinforcement required to facilitate their connection. Where a new connection triggers reinforcement, the connection customer contributes to work at the same voltage as the point of connection, plus the one above. Any reinforcement at two voltage levels above is fully funded by the Distribution Network Operator. This reflects that reinforcement at these levels is likely to provide a shared benefit to a wider group of users. This is referred to as the "voltage rule". Distributed generators that trigger reinforcement also face a High-Cost Cap (HCC). The HCC states that all reinforcement above £200/kW is fully funded by the customer. Where both the voltage rule and HCC apply, the voltage rule is applied first (that is, the HCC only applies to reinforcement at the same voltage level as the connection plus one above).

5.0 SUMMARY OF THE MAJOR AREAS OF PROPOSED CHANGES

The RIC has reviewed the CCP (2009) and proposes that the fundamental tenets and principles of the CCP should be retained as it represents a standardised, transparent approach that T&TEC has successfully implemented over the years. This approach is not unique; it is similar to approaches utilised in other jurisdictions.

Notwithstanding the above, the RIC has proposed a few changes/measures to improve the effectiveness of the CCP. The major areas of proposed changes are as follows:

1. D1-D4 customers to fully fund the cost of capital works for their connection, as determined by T&TEC in accordance with the outlined "deep" charging policy;
2. The avoided cost principle to be utilised as the basis for sharing "reinforcement (augmentation)" costs for A-B1 customers and multi-occupant developments;
3. A-B1 customers applying for enhanced services to fully fund the cost of capital works for their connection (i.e. no revenue offset); and
4. The costing methodology outlined for multi-occupant developments is to be universally applied to overhead and underground infrastructure.

APPENDICIES

Appendix A – Key Definitions

- Capital Contribution – means a financial contribution made (or the equivalent in the form of assets) by a network user associated with designing, constructing, installing and commissioning the electricity network assets of a service provider.
- Commercially Viable – that is, an extension will be considered commercially viable if the service provider can be reasonably expected to recover the costs of extension without increasing the tariffs payable by existing network users.
- Connect (or connection) – means to establish an effective link via the installation of the necessary connection equipment.
- Connection Assets (or connection equipment) – means all of the equipment that is used only to transfer electricity to or from the electricity network at the relevant connection point or which is installed to support or to provide backup as is necessary for that transfer.
- Connection Point (Linkage Point) – means a point at which electricity is transferred to or from an electricity network (or point at which the use of assets changes from being dedicated to one or more customers, to being shared among customers generally).
- Contestability – refers to works where the customer has a choice of utilising a private contractor.
- Contributed Assets- means any network asset fully funded by a customer.
- Extension means to enlarge or expand the capability of the electricity network to accept, transport and deliver electricity.
- Network Augmentation – means works required to be constructed to provide a new customer on the side of connection point where the works are shared among customers generally.
- Network – means an electricity distribution network.
- Network System Assets – means the apparatus, equipment, plant and building used to convey, and control the conveyance of electricity.

Appendix B – Example of Connection Services of an electricity utility in Australia

Connection Services			
Connection type	**Description**	**AER Service classification**	**Contract type**
Basic connection service	Basic connection services are those connection services we provide on a routine basis and generally at a fixed fee. This type of connection service includes both new connections or alterations to existing connections, which generally involve minimal or no augmentation/extension of our network. These services are generally provided to the following customers: • residential customers (requiring no extension or upgrade); • small business customers up to a capacity of 100 amps per phase or less; and • small embedded generators with a generating capacity of 5kW or less for a single-phase connection or 30kW or less for a three-phase connection (eg most customers who wish to install solar PV panels on their premises).	**Standard Control Service** (SCS)	**Model Standing Offer** (MSO) A MSO contains a default set of terms and conditions that are approved by the AER.[6] However, a customer may seek to negotiate their individual connection contract. This will be provided as a Negotiated Offer[7]
Negotiated connection service	Negotiated connection services are generally more complex and more likely to require us to augment or extend our network. Where the estimated costs of a new or altered connection exceed the estimated revenue, the connection applicant may be required to contribute toward the costs of the premises connection assets and any required network extensions. A shared network augmentation charge may also apply where the customer's estimated maximum demand exceeds the threshold of: • 70kVA, or 25kVA where a connection applicant's premises are supplied from a non three-phase network such as the 19kV SWER (Single Wire Earth Return) network; or • 0 kVA if connection applicant is a real estate developer. The connection related works may include: • **premises connections** – includes any additions or upgrades to the connection assets located on the customer's premises (but excluding metering services); • **extensions** – includes any new additions required to connect a powerline from our network to the Customer's connection assets; and/or	**Alternative Control Services (ACS)** - premises connection, **Standard Control Service** (SCS) – extension & augmentation	**Negotiated Offer** A Negotiated Offer is where a connection applicant negotiates the terms and conditions on which the connection service is to be provided[8]. Typically, this is provided on a quoted (offer) basis.
	• **network augmentation** – includes any enlargement/enhancement of our existing network, which is not an extension.		

Enhanced Connection Services			
Connection type	**Description**	**AER Service classification**	**Contract type**
Enhanced connection service	These connection services are provided at a standard that is above (or below, where permissible) the LCTAS, at the request of customers and charged at full cost of works. This category also includes connections for large embedded generators. Examples would include requests for a connection service that has: • increased (or decreased, where permissible) reliability, standards and/or regulatory requirements (eg duplicate supply, dedicated assets, upgrade from overhead to underground service etc); • excess levels of capacity or service (eg upgrade of single phase to three-phase, excess asset capacity, specialised/non-standard technical services etc); and/or • large embedded generators with a generating capacity of equal to or more than 5kW for a single-phase connection or more than 30kW for a three-phase connection.	**Alternative Control Service** (ACS) & **SCS** – extension & augmentation up to LCTAS	**MSO and/or Negotiated Offer** A Negotiated Offer is where a connection applicant negotiates the terms and conditions on which the connection service is to be provided[9]
Notes • for **Enhanced connection services**, customers are typically required to make a capital contribution that is additional to any other requested services including a request for a negotiated connection service; and • this capital contribution will be determined on a quoted (offer) basis (ie Negotiated offer)			

Appendix C - Current & Proposed Charging Policy

Rate Class Customer Type	Current Charging Policy	Proposed Charging Policy
Rate A- Residential (new connection)	Shallowish – Incremental Revenue Approach	Shallowish – Incremental Revenue Approach
Rate B- Commercial (new connection)	Shallowish – Incremental Revenue Approach	Shallowish – Incremental Revenue Approach
Rate B1- Commercial (new connection)	Shallowish – Incremental Revenue Approach	Shallowish – Incremental Revenue Approach
Rate A- B1 (enhanced connection)	Shallowish – Incremental Revenue Approach	Deep
Multi-occupant development	Deep (with an exception for shared cost on the HV Network)	Deep (with an exception for shared cost on the HV Network)
Multi-occupant buildings (5 or more accounts)	Deep (with an exception for shared cost on the HV Network)	Deep (with an exception for shared cost on the HV Network)
Rate D1 Small Industrial (all connections)	Shallowish – Incremental Revenue Approach	Deep
Rate D2 Medium Industrial (all connections)	Shallowish – Incremental Revenue Approach	Deep
Rate D3 Large Industrial (all connections)	Shallowish – Incremental Revenue Approach	Deep
Rate D4 large Industrial (all connections)	Shallowish – Incremental Revenue Approach	Deep
Rate D Large Industrial (all connections)	Deep	Deep
Rate E1 Large Industrial (all connections)	Deep	Deep
Rate E2 Large Industrial (all connections)	Deep	Deep
Rate E5 Large Industrial (all connections)	Deep	Deep