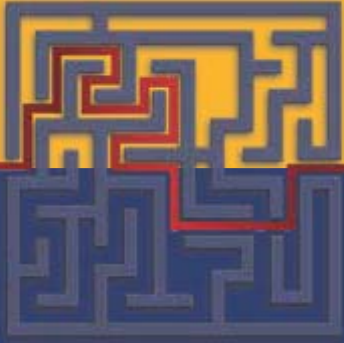


Tackling high electricity connection costs: Trinidad and Tobago's new approach



- Around the world, high connection costs are a barrier to getting electricity. The getting electricity indicator shows that connection costs for entrepreneurs are highest in Sub-Saharan Africa.
- The most effective regulatory systems govern connection costs in a way that is cost effective for utilities and fair for customers.
- Studies often focused on the balance between connection costs and consumption tariffs. But when analyzing connection costs, few studies assessed cost allocation between new customers requesting connections and future customers who might benefit from them, which is the focus of this case study.
- Trinidad and Tobago lowered connection costs by introducing a capital contribution scheme to resolve the “free rider” issue (which occurs when first customers fund the entire construction works, to the benefit of future customers).
- The new scheme was implemented through extensive collaboration among multiple stakeholders, including the regulator, electricity utility and entrepreneurs.

Access to electricity is essential for firms. Yet many entrepreneurs around the world struggle with high costs to connect to electricity grids. In 2013 the cost to connect a single warehouse to a power supply ranged from an average of \$19,112 in South Asia to \$38,500 in Sub-Saharan Africa. Globally the average was \$29,134 (figure 6.1). Self-supply is much more costly—often prohibitively so.¹ Moreover, high electricity connection costs often go hand in hand with high transmission and distribution losses.²

Experts contacted by *Doing Business* identified high connection costs as the main barrier to accessing electricity in their countries (figure 6.2). That was the case for all income groups except low-income economies, for whom a lack of generation capacity is the main barrier.

UTILITIES SPREAD NEW CONNECTION COSTS BETWEEN TARIFFS AND CONNECTION FEES

Every electricity utility has to recoup the costs of a generation plant, transmission and distribution networks and to foster income for future expansion. One way of doing so is by levying network costs to new customers, in the form of an advance lump sum payment to facilitate infrastructure works for an electricity supply. This lump sum is called customer's capital contribution.

If a customer is not near the existing network or the network is already fully used and new capacity is required, the cost of extending the network might be high. In such cases customers have to pay all or part of the capital cost—which might be a significant barrier to obtaining a new connection, especially in low-income

areas. Alternatively, if a large share of the costs is recovered through tariffs rather than through advance lump sum payments, new customers enjoy a significant benefit at the expense of other customers.

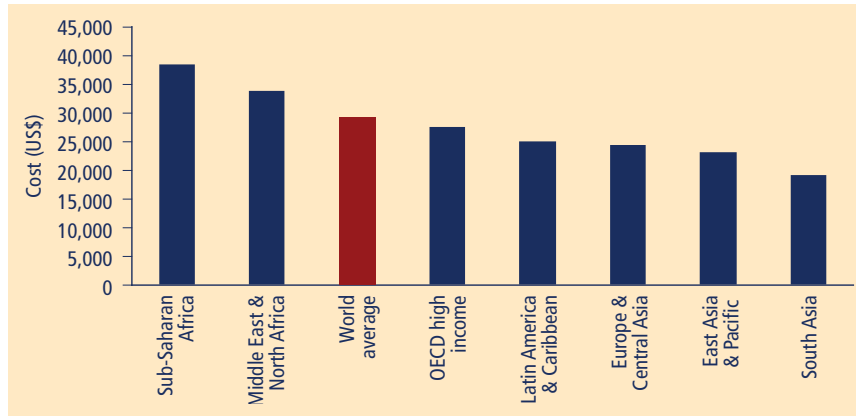
UTILITIES HAVE TO BALANCE NEW CONNECTION COSTS BETWEEN PRESENT AND FUTURE REQUESTS

Many studies have focused on the balance between connection costs and tariffs. This case study highlights one way of striking the right balance between costs for new and future connection requests.

Costs for electricity connections are usually set by distribution companies and often reviewed by regulators when such agencies exist. Because utilities allocate costs for new connections between existing and prospective customers, they also have to balance economic efficiency and fairness. But it is often difficult to distinguish between capital works for specific customers and those needed for projected growth or safety and reliability. That leaves room for new customers to pay for investments in the network that will benefit other customers as well.

Consider a customer who wants to connect a warehouse to electricity. The customer's premises could get connected to an existing transformer with sufficient spare capacity, or the utility could install a new transformer. This latter case could happen because a transformer is required for the customer but it could also be that the utility has development plans and wants to connect future customers to this transformer. Transformers are expensive. Customers can end up paying for more

FIGURE 6.1 The average cost to connect to electricity varies by region



Source: Doing Business database.

than is needed for connection requests, subsidizing future customers. Explicit rules on the allocation of costs are essential for fairness to customers.

In addition, connection costs are not fully transparent in many economies. Utilities often present customers with individual budgets instead of regulated capital contribution policies aimed at spreading the fixed costs of expanding networks. It makes it even more difficult for customers to assess how connection costs are spread among their requests and possibly reinforce the electricity network.

WHAT HAS THE GETTING ELECTRICITY DATA SHOWN?

While there are many datasets on energy demand and supply quality, previously no global dataset existed on benchmarking connection costs across economies. The getting electricity indicator offers an annual comparison of the procedures, time and cost of obtaining an electricity connection in 189 economies, with data going back to 2009. Of the 3 indicators, costs vary most. This study aims to identify bottlenecks and good practices about calculating costs for new customers. Economies have tackled high connection costs in different ways. In Japan, it costs nothing for an entrepreneur to connect a warehouse to electricity—the costs of expanding the distribution network are covered by electricity tariffs. Papua New Guinea's

utility has a payment scheme that allows customers to pay capital contributions in monthly electricity bills.

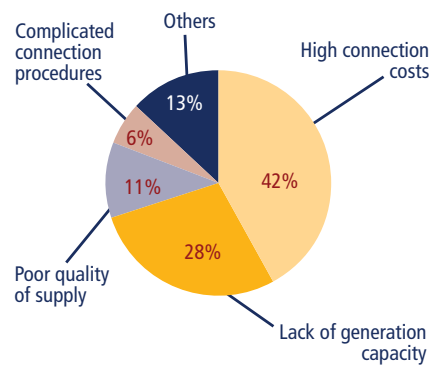
The indicator shows that costs can usually be divided into 2 categories: a clearly regulated connection fee based on a formula or set as a fixed price, and variable costs for the connection that take into account the labor and material required. Where a new connection can be made directly to the low-voltage network, regulated and fixed fees represent a larger share of the connection cost in high-income economies. In general, the higher the income per capita is in an economy, the higher is the share of regulated fees in the total cost.

Sweden is among those that provide clear regulation of fees. For the 140-kilovoltampere (kVA) connection assumed in the getting electricity case study, costs are fixed and based on an average for similar projects in the area. Information on fees also tends to be more easily accessible in higher-income economies—in a regulation, on a website or through a brochure or board at a customer service office.

TRINIDAD AND TOBAGO'S EFFORTS TO MAKE ACCESSING ELECTRICITY FAIRER

Trinidad and Tobago's strategy for lowering electricity connection costs focused on finding a fair scheme to allocate costs between new and future customers. In

FIGURE 6.2 High connection costs are the main barrier to accessing electricity



Source: Doing Business database.

2006 T&TEC—Trinidad and Tobago's public, regulated electricity utility—got complaints about the costs of connecting to electricity. The most controversial issue was the capital contribution. Where the distance of the customer was far from the network or the network was fully used and new capacity was required, extending the network would increase the overall cost.

Customers paid for extensions (less the offset of revenues from the connection in the third year) required to connect to the system. If another customer sought a connection the new customer would be able to use the assets funded by the first customer. So a free-rider problem arose. There was no mechanism to reimburse customers that had funded connection assets shared by others whose emergence was not anticipated at the time of original application.

The legal basis for the capital contribution imposed by T&TEC arose from the T&TEC Act, Chapter 54:70 which states that clients had to pay for new electricity connections if they were more than 60 feet away from the existing grid. T&TEC presented individual quotes to customers who had no basis to contest them should they want to. A customer requesting a new connection of 140 kVA for a warehouse located 150 meters away from the existing network had to pay more than \$8,000 in Port of Spain in 2009.

ESTABLISHING A CAPITAL CONTRIBUTION WORKING GROUP HELPED

Trinidad and Tobago's regulator, the Regulated Industries Commission (RIC), recognized that the capital contribution was contentious because the calculation of connection costs was complex and somewhat subjective. In 2006 the RIC established a working group to review capital contributions. The group was comprised of representatives from non-governmental organizations, the Chamber of Industry and Commerce, Bureau of Standards, Ministry of Legal Affairs, Electricity Commission and the RIC. The chair of the group was a representative from the Network of NGOs of Trinidad and Tobago for the Advancement of Women.

The group adopted a comprehensive approach that examined procedures and acts regulating capital contributions and looked into what utilities in other economies were doing. Their research focused on whether there was a clear, formal capital contribution policy, the issues addressed in the policy (such as for exemptions, reimbursement and dispute resolution) and the methods used to determine the capital contribution.

The group found that globally, service providers give users different ways to connect to electricity networks. One involves customers paying the total costs incurred as a result of connecting a new load to the system, including the costs of network reinforcement. Another involves

customers paying only for the assets required to connect to a system, excluding the costs of extending and reinforcing the distribution system. A third option followed by a few service providers, where the costs of assets for a new connection are deemed part of the general system and so are recoverable from all users through tariffs or system charges.

RECOMMENDATIONS FROM THE CAPITAL CONTRIBUTION WORKING GROUP AND FINAL PROPOSAL BY THE REGULATED INDUSTRIES COMMISSION

The Capital Contribution Working Group submitted its report to the Regulated Industries Commission in early 2007, and the report was widely circulated to stakeholders and the public.³ The document was finalized in 2008 and implemented by T&TEC in 2009/10, making connection costs fairer and more transparent. The groups also made 3 main recommendations for Trinidad and Tobago that have been implemented:

- *Introducing a reimbursement scheme.* To ensure that connection costs are more widely spread across different users, assets eventually shared by customers connecting later must be reimbursed to initial customers by T&TEC (figure 6.3).
- *Setting connection costs with revenue from electricity supply.* T&TEC is required to show that a connection is not commercially viable without a capital contribution and that it should be no

more than what it would cost to be commercially viable. This approach allows a balanced allocation of costs because a new connection is also a source of future revenue. But large industrial customers still bear the full capital costs of connecting to the network, and connection costs are small relative to the company's turnover.

- *Involving the private sector.* Customers can use T&TEC employees or contractors for conducting connection works. But T&TEC should prepare a list of prequalified contractors for customers, specify technical criteria and inform customers about the average costs of works in various areas. Many economies have opened their electricity markets to prequalified contractors—offering more options to customers and helping utilities meet the demand for new connections in a timely, cost-effective way.

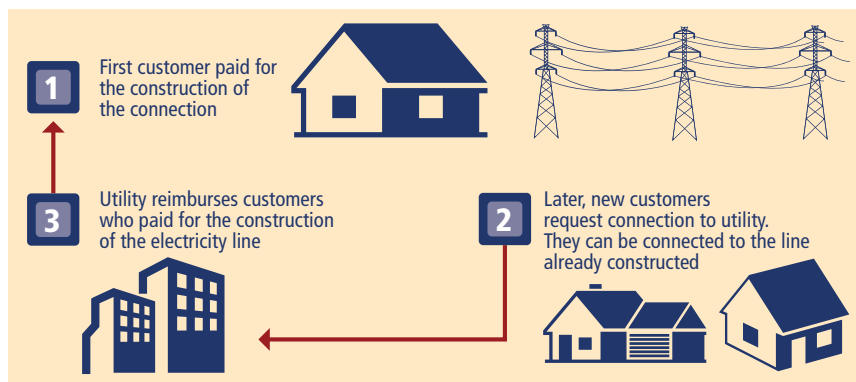
OBSTACLES TO IMPLEMENTING THE NEW POLICY

As with any new policy, there was some resistance from the party administering the changes. T&TEC initially found it difficult to get its staff to support the new policy. Workers considered reimbursement the most burdensome issue because it required keeping records of the first client and subsequent ones, along with the works concluded for each. The task is tedious, as a detailed break-down of the works and associated costs is needed to identify future parts that benefit customers connected later. T&TEC upgraded its system to track new connections with the required details and provided training to implement the policy. The Regulated Industries Commission also extensively publicized the new policy in major newspapers and met repeatedly with T&TEC leadership and distribution staff.

THE SCHEME IS WORKING

By 2013 T&TEC had implemented the regulator's recommendations. When installing new connections, the electricity company's engineers clearly mark the installed equipment and materials and link them with the customer's records in the utility's database. If new customers

FIGURE 6.3 How does the reimbursement of capital contribution work?



request connections, the utility personnel inspect the location and verify if the surrounding network has been marked earlier. Based on this information, T&TEC staff calculates how much should be reimbursed to previous customers.

This reform has allowed for a broader distribution of connection costs in Trinidad and Tobago. It has also lowered the cost for connecting a standardized warehouse as measured by the getting electricity indicator. After the reform the cost of a connection for a small warehouse dropped by more than eight times, to less than \$1,000 in 2013.

WHAT WORKED WELL?

- *Having an active regulator.* A study of regulators in Latin America and the Caribbean found that Trinidad and Tobago's Regulated Industries Commission ranks highest in electricity governance.⁴ The commission's strong push for reform of the capital contribution policy made it work.
- *Involving stakeholders from the start.* Bringing in stakeholders from the beginning and getting the utility on board was a good idea. The utility was part of the working group, and its views were taken into account at all stages. Public consultations were conducted by the Regulated Industries Commission on the Working Group's report and enabled people to contribute to the process.
- *Learning from other utilities.* The Regulated Industries Commission and T&TEC conducted extensive research on reform and learned from global good practices—and so made well-informed recommendations and decisions.
- *Clearly communicating about the reform.* The Regulated Industries Commission conducted a thorough public relations campaign—including television, radio and newspapers—to explain the new policy. People could call in during television and radio programs to ask questions, an approach that was highly appreciated. Most of the questions were about reimbursement and contestability.

NOTES

This case study was written by Maya Choueiri, Caroline Frontigny and Jayashree Srinivasan.

1. Foster and Steinbucks 2009.
2. Geginat, Gonzalez and Saltane 2012.
3. Regulated Industries Commission 2008.
4. World Bank 2009.