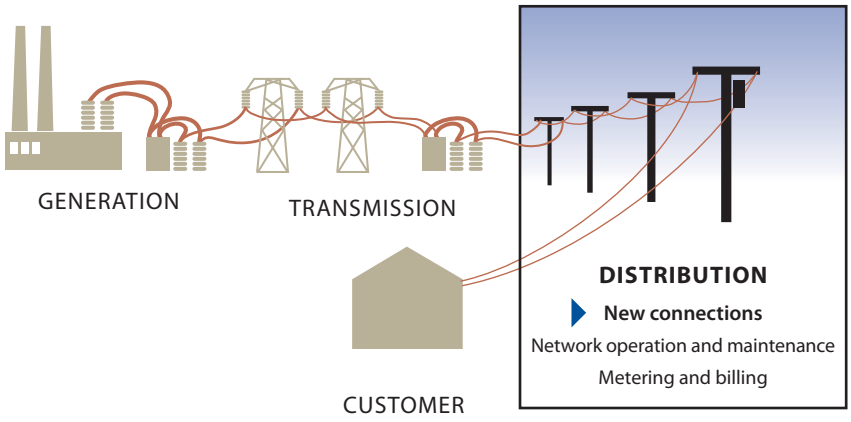
Annex: pilot indicators on getting electricity

FIGURE 12.1

***Getting Electricity* measures the connection process at the level of distribution utilities**



A young entrepreneur who manufactures home furnishings in Moscow is working hard to expand her business by setting up a new warehouse. She negotiated financing with the bank, spent weeks getting building and operating permits and invested in new machinery as well as a new building. She has employees lined up and is ready to get started. But the young entrepreneur will have to wait. She needs to obtain a new electricity connection for the warehouse, and in Moscow that requires many interactions with the utility, takes more than 10 months on average and costs more than 40 times the income per capita.[1]

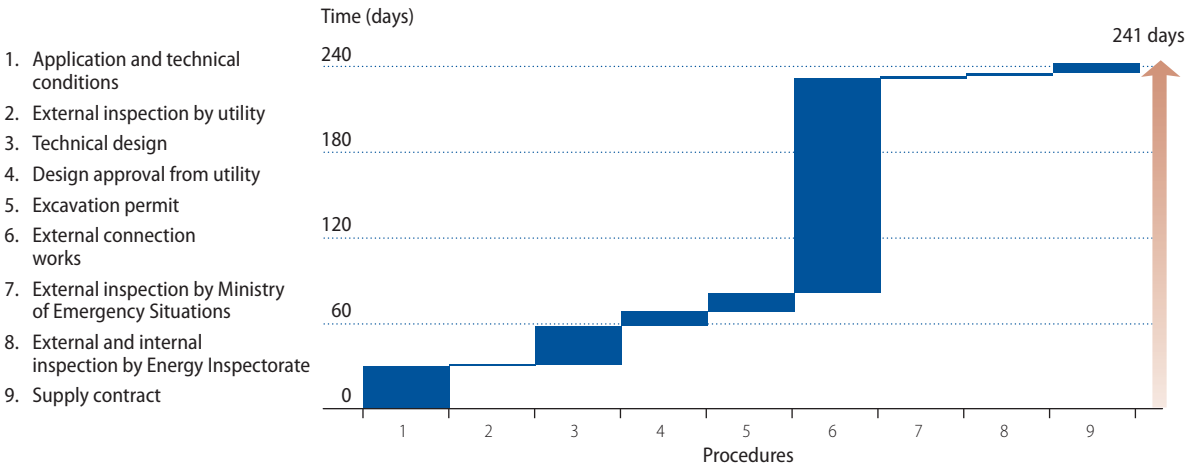
Compare the experience of a similar entrepreneur in Germany, constructing a warehouse in Berlin-Westhafen. His warehouse is hooked up to electricity in less than 3 weeks. The process involves just 3 interactions with the utility and costs only half the country's income per capita.

World Bank Enterprise Surveys in 108 economies show that firms consider electricity to be among the biggest constraints to their business.[2] Poor electricity supply has adverse effects on firms' productivity and the investments they make in their productive capacity.[3] To counter weak electricity supply, many firms in developing economies have to rely on self-supply through a generator.[4] The cost of self-supply is often prohibitively high, especially for small firms,[5] underlining the importance of utilities' providing reliable and affordable electricity to businesses.

Whether electricity is reliably available or not, the first step for a customer is always to gain access by obtaining a connection. It is this first and key step that *Doing Business* aims to measure through a new set of indicators. Introduced in *Doing Business 2010* with data for an initial 140 economies, these indicators measure the procedures, time and cost for obtaining a new electricity connection. The *Getting Electricity* data set covers only a small part of electricity service (figure 12.1). Yet it provides information on a number of issues for which data previously did not exist for such a large number of economies.

FIGURE 12.2

Procedures to obtain an electricity connection in Azerbaijan add up to an 8-month process



Source: Getting Electricity database.

In 2009/10 *Doing Business* disseminated a report with more detailed findings among regulators and academics to solicit feedback on the *Getting Electricity* methodology and increased the sample of economies surveyed to 176.[6] As a result of the additional research and feedback, minor changes were made to the methodology to clarify the underlying case study (for details on the methodology, see Data notes).

WHERE ARE CONNECTION PROCESSES LONG AND CUMBERSOME—AND WHY?

In Baku, Azerbaijan, to get connected to electricity by the local distribution utility requires 9 procedures, including undergoing multiple inspections by the utility and 2 outside agencies and getting a permit from the Ministry of Transport (figure 12.2). The cumbersome process takes 241 days and costs $31,848, or 658% of income per capita.

Among the 176 economies surveyed, Azerbaijan ranks among the 10 with the most procedures. Economies such as Germany, Japan, Mauritius and the Federated States of Micronesia make it much easier for businesses to connect to electricity (table 12.1).

The economies where the connection process involves relatively few procedures are also those where customers get connected faster. Where businesses have to go through 3–5 procedures to get connected, the process takes 99 days on average. But in economies with 6–11 procedures, it takes 138 days on average. And in the 10 economies with the most, it takes 233.

Why are particular procedures needed, and how can utilities minimize their effect in delaying connections?

TABLE 12.1

Who makes getting electricity easy—and who does not?

Procedures *(number)*			
Fewest		**Most**	
Germany	3	Armenia	8
Japan	3	Kyrgyz Republic	8
Mauritius	3	Mongolia	8
Micronesia, Fed. Sts.	3	Nigeria	8
Qatar	3	Sierra Leone	8
St. Vincent and the Grenadines	3	Azerbaijan	9
Sweden	3	Russian Federation	9
Switzerland	3	Tajikistan	9
Timor-Leste	3	Uzbekistan	9
Iceland	4	Ukraine	11
Time *(days)*			
Fastest		**Slowest**	
Germany	17	Vanuatu	257
St. Kitts and Nevis	18	Nigeria	260
Iceland	22	Pakistan	266
Austria	23	Czech Republic	279
Samoa	23	Russian Federation	302
Taiwan, China	23	Ukraine	309
St. Lucia	25	Kyrgyz Republic	337
Rwanda	30	Madagascar	419
Chile	31	Guinea-Bissau	455
Puerto Rico	32	Liberia	586

Source: Getting Electricity database.

MISSED OPPORTUNITIES FOR STREAMLINING

Connection delays increase significantly where utilities and other public agencies miss opportunities to streamline approvals. Take Cyprus. Before the utility can issue an estimate to a new customer, it must contact several government authorities, including the telecommunications authority, sewerage authority, public works department, municipality, archaeological department and fire brigade. This clearance process alone takes 3–6 months. Meanwhile, the work to install the connection must wait.

Where delays occur because other public agencies are excessively slow and bureaucratic, utilities may be tempted to shift the administrative hassle to their customers.[7] Among the procedures most commonly transferred to customers is applying to the municipality or the department of roads or transport for an excavation permit or right of way so that the utility can lay the cables or extend wires for the connection. Customers seeking a connection undertake such procedures in 39 economies. Wait times range from 1 day in Algeria to 60 in Madagascar, Mongolia and República Bolivariana de Venezuela. In Egypt customers have to contact 2 agencies to obtain an excavation permit: the district office and the Greater Cairo Utility Data Center.

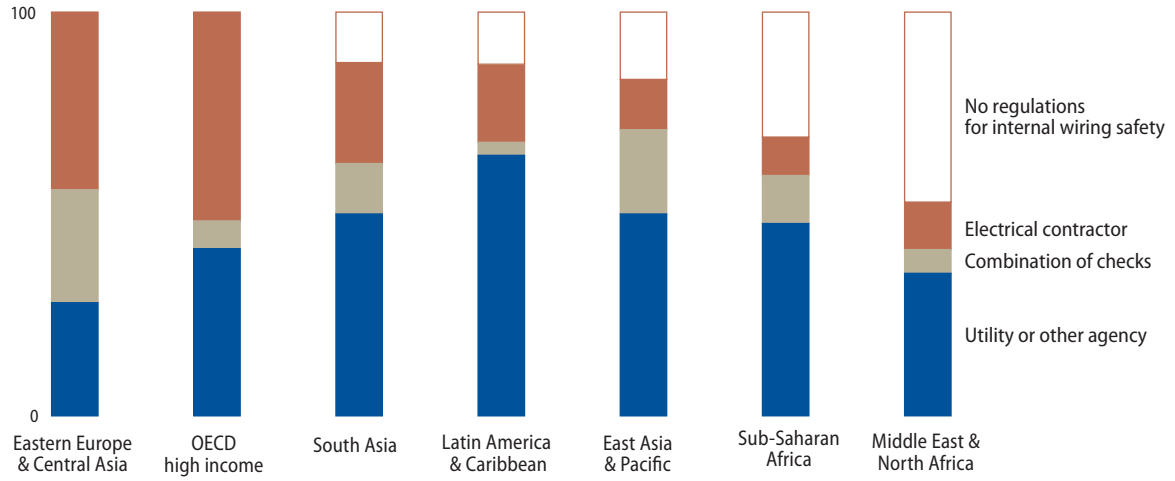
But relegating the administrative burden to customers is not the only option. Successful utilities engage actively with other service providers to ensure that working relationships are clear and function smoothly. Take recent efforts in Hong Kong SAR (China). In March 2010 the utility established a working group with the police force and highway and transport departments to work out performance pledges that would allow quicker turnaround of approvals for excavation permits.

DIFFERENT WAYS TO DEAL WITH SAFETY CONCERNS

According to a survey by the Vietnam Standards and Consumer Protection Association, 83% of electrical wiring in Ho Chi Minh City fails to meet quality standards.[8] In the United States during a typical year, home electrical problems account for 67,800 fires, 485 deaths and $868 million in property losses. In urban areas faulty wiring accounts for 33% of residential electrical fires.[9]

The safety of internal wiring installations is a concern not only for those

FIGURE 12.3
Who is responsible for enforcing safety standards?
Economies by type of safety certification for internal wiring (%)



Source: Getting Electricity database.

using a building but also for utilities. One customer's faulty internal wiring can lead to power outages affecting other customers connected to the same distribution line. Because the quality of the internal installation matters to utilities and the public alike, in most economies customers seeking a connection for their business need to go through some procedure to ensure that quality.

The approach taken to address safety issues varies. Some economies regulate the electrical profession by establishing clear liability arrangements for electrical contractors. Others regulate the connection process by requiring customers to obtain additional inspections and certifications from the utility or outside agencies before a new connection is granted (figure 12.3).

Getting Electricity data suggest that economies that regulate the electrical profession rather than the connection process itself not only lessen the burden on customers but also have shorter average connection delays. In economies such as Denmark, Germany and Japan the quality of the internal wiring is the responsibility of the electrical contractor who did the installation. The utility simply requests certification by the electrical contractor that the internal wiring was done in accordance with the prevailing standards, usually established by the relevant professional bodies. The customer is not involved.

But where professional standards are poorly established or qualified electrical professionals are in short supply, utilities or designated agencies may be better placed to carry out inspections that ensure the safety of customers, even if this leads to connection delays. In 15 of the 31 economies surveyed in Latin America and the Caribbean, customers are required to contact an outside agency—often a regulatory agency, municipality or fire department—to inspect the internal wiring.

Economies seeking to shift from regulating the connection process to regulating the electrical profession have to be careful not to transfer responsibility to private professionals too early. Take the experience in South Africa.[10] In 1992, in an attempt to free utilities from the burden of inspecting internal wiring, the government made private electricians liable for the quality of their wiring installations. But the shortage of qualified electrical professionals, and the ambiguity of the regulations in assigning responsibilities, led to an increase in customer complaints about substandard wiring. After 8 years of heated debate the government introduced new internal wiring regulations in May 2009, clarifying standards for electrical installations and the issuance of compliance certificates and introducing nonmandatory inspections by a new independent authority. The government is also working to reduce the shortage of skilled electricians in the country.

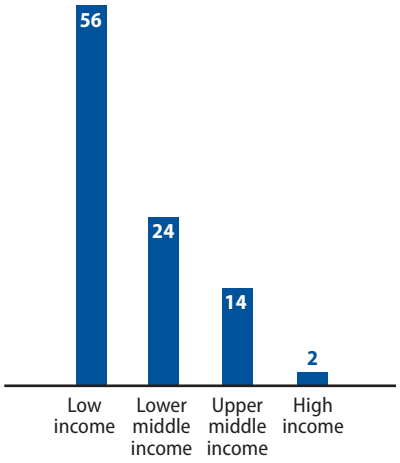
While different approaches to dealing with the safety of internal wiring installations can make sense in different environments, some cases emerging from the *Getting Electricity* data clearly suggest room for immediate improvement. Because electrical safety is a public concern, governments that require no checks of electrical installations may fail to provide an important public good. Twenty-nine economies, many of them in the Middle East and North Africa and Sub-Saharan Africa, fall into this category. At the other extreme are governments that require multiple checks, imposing an excessive burden on customers seeking to get connected. Twenty-two economies, many of them in Eastern Europe and Central Asia, are in this category.

MATERIAL SHORTAGES

Connecting a new customer to an electricity network requires materials and equipment. If the new connection is through an overhead line, wires must be extended; if it is through an underground connection, cables must be laid. Often the utility will also have to install

FIGURE 12.4
Lack of materials causes delays for utilities in 56% of low-income economies

Share of economies where lack of materials delays new electricity connections (%)



Source: Getting Electricity database.

meters, new electricity poles and heavy equipment such as distribution transformers. Requirements for materials not only translate into costs; they also can lead to longer wait times.

Utilities, especially those in low- and lower-middle-income economies, often have to delay new connections because they lack the materials needed (figure 12.4). In 39 economies survey respondents reported additional wait times—up to 180 days in Vanuatu—because in more than 50% of cases where new connections were requested, the utility did not have such critical materials as meters or distribution transformers in stock and had to order them specially. This suggests that the utility faces either financial or inventory and procurement management constraints.

In 16 economies the utility completing the external connection works asked customers to provide such materials as poles, meter boxes or transformers because it did not have them in stock. Requiring individual customers to purchase materials is not a cost-effective way to maintain a distribution network. But customers are often happy to comply. In Malawi customers purchasing the materials themselves reduced the time required for obtaining a connection from 2–3 years to 8 months on average.

Just buying the materials sometimes is not enough. Where utilities shift this responsibility to customers, they have to ensure that the customers buy the right materials. This can mean additional procedures. Customers in such economies as Côte d'Ivoire, Guyana, Kosovo, Madagascar, Nepal and Sierra Leone have to prove to the utility that the materials they purchased comply with the standards. Sometimes they must even present the materials for testing at the utility.

WHAT DOES IT COST TO GET CONNECTED?

The same electricity need can require different connection works, depending on how constrained installed capacity is. In some economies the *Getting Electricity* customer requesting a not trivial but still relatively modest 140-kilovolt-ampere (kVA) connection would simply receive an overhead line or underground cable connection.[11] But in many others the capacity of the existing network is constrained, and 140-kVA electricity therefore requires a more complicated connection effectively leading to an expansion of the distribution network. Such connections require significant capital investments (such as the installation of distribution transformers), often covered by the new customer.

Accommodating the demand of the *Getting Electricity* customer is naturally more likely to require additional capital investment in low-income economies, where the installed electrical capacity tends to be more constrained—driving up absolute connection costs for new customers. The 10 economies with the lowest costs are all high income except the Marshall Islands and Panama. The 10 with the highest costs are all low income except Djibouti (table 12.2). Yet connection costs are not just a function of the general infrastructure in an economy. They vary significantly among economies within income groups, suggesting room to reduce the cost regardless of existing infrastructure (figure 12.5).

TRANSPARENCY AND ACCOUNTABILITY MATTER

As utilities allocate the costs for new connections between existing and prospective customers, they have to balance considerations of economic efficiency and fairness. In practice, it is often difficult to distinguish between capital works needed to connect specific customers and those needed to accommodate projected growth or to improve the safety or reliability of the distribution network. This leaves room to make new customers pay for investments in the network that will benefit other customers as well. Connection costs should therefore be as transparent as possible, to allow customers to contest them when they feel they are paying more than they should.

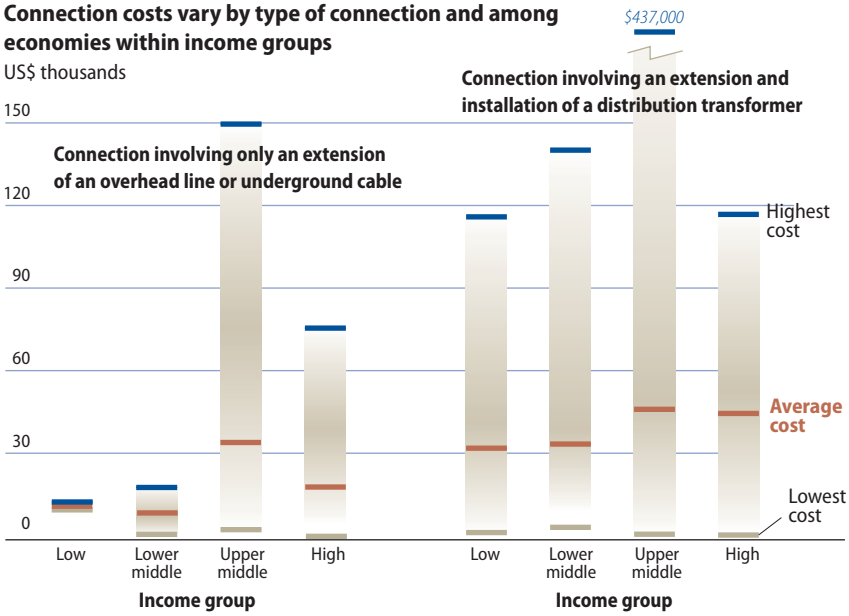
But connection costs in many of the economies surveyed are not fully transparent. Utilities far too often present customers with individual budgets rather

TABLE 12.2
Who makes getting electricity least costly—and who most costly?

Cost *(% of income per capita)*			
Least		**Most**	
Japan	0.0	Madagascar	8,268.0
Hong Kong SAR, China	1.9	Djibouti	10,008.1
Trinidad and Tobago	2.5	Malawi	11,703.7
Qatar	5.1	Guinea	13,275.4
Marshall Islands	6.5	Central African Republic	13,298.3
Iceland	6.6	Chad	14,719.8
Norway	7.3	Burkina Faso	14,901.3
Australia	9.5	Benin	15,452.0
Panama	9.9	Congo, Dem. Rep.	27,089.4
Israel	12.6	Burundi	36,696.7

Source: Getting Electricity database.

FIGURE 12.5
Connection costs vary by type of connection and among economies within income groups

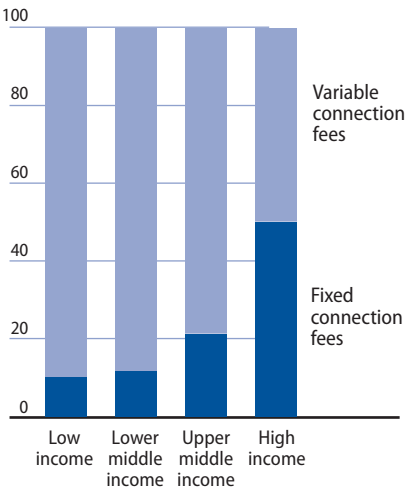


Source: Getting Electricity database.

than follow clearly regulated capital contribution policies aimed at spreading the fixed costs of expanding the network over several customers. To illustrate, *Getting Electricity* divides costs into 2 main categories: a fixed connection fee based on a clear formula (often linked to the peak electricity demand of the customer to be connected), which is usually publicly available; and the variable costs for the connection, accounting for the labor, material and inspections required.[12]

The fixed connection fee represents a far bigger share of the total cost in high-income economies than in low- and middle-income economies (figure 12.6). And where the share of those fixed costs is higher, connection costs also tend to be lower. This suggests a potential for lowering connection costs by improving the transparency of the costs and strengthening the accountability of utilities.

FIGURE 12.6
Variable fees a big share of the cost in low- and middle-income economies



Source: Getting Electricity database.

BURDENSOME SECURITY DEPOSITS

Security deposits are one cost item worth highlighting. Utilities in 82 of the 176 economies surveyed charge customers security deposits as a guarantee against nonpayment of future electricity bills.[13] Security deposits are particularly common in Latin America and the Caribbean and in Sub-Saharan Africa. While they average $9,988, they can run as high as $55,609, as in Dominica.[14]

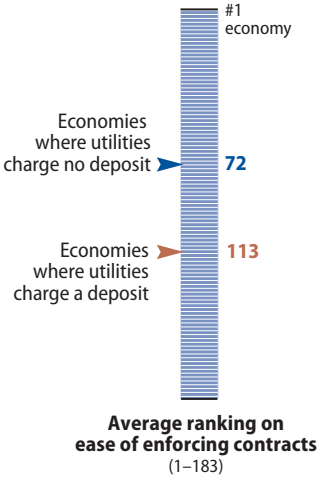
Because most utilities hold the deposit until the end of the contract and repay it without interest, this requirement can impose a substantial financial burden on small and medium-size businesses, especially those facing credit constraints. In Ethiopia a medium-size company is effectively granting the utility an interest-free credit equivalent to 121% of income per capita—and being prevented from putting the money to a more productive use.

Not surprisingly, where court systems are inefficient and contracts can be enforced only with significant delays, utilities are more likely to request a security deposit (figure 12.7).

Where utilities feel that they have to rely on security deposits, they should at least consider lessening the financial burden for customers. In 20 economies utilities do so by allowing customers to settle the security deposit with a bank guarantee or bond rather than deposit the entire amount with the utility. The service cost for such bank guarantees usually amounts to less than the interest that customers lose on the deposit. More important, bank guarantees both allow customers to keep control of their financial assets and improve their cash flow.

Where credit reports are widely available, utilities can be more selective, asking only customers with a weak credit history to put up a security deposit. This is done in Australia and Austria. Where credit reports are hard to come by, ownership can also be used as a screening device. In Argentina and El Salvador only customers that do not own the property being connected must put up a deposit.

FIGURE 12.7
Utilities more likely to require security deposits where courts are inefficient



Note: Relationships are significant at the 1% level and remain significant when controlling for income per capita.

Source: Getting Electricity database; *Doing Business* database.

WHO MADE GETTING ELECTRICITY EASIER IN 2009/10?

Reforms making it easier to get an electricity connection are complex—often involving such stakeholders as regulatory agencies and other public service providers—and take time to implement. Connection processes were reformed in 8 economies in 2009/10.

Mexico had the most radical reform in getting electricity. The government liquidated the state-owned electrical utility company that served Mexico City because severe structural problems had made the company financially nonviable. The distribution concession for the city was transferred to Mexico's largest state power company. In less than a year the new concessionaire was able to substantially shorten connection delays. Before, customers in Mexico City had to be prepared to wait 10 months to get a new electricity connection, the longest wait in Latin America and the Caribbean. Now the average wait is 4 months.

Several other utilities also cut connection times by streamlining internal procedures. Changing procurement practices for materials and making application procedures faster cut wait times at the utility in Tanzania by 9 months. In Suriname the utility introduced an improved customer service policy in the second quarter of 2009 that reduced the wait for inspections and external connection works. Other efforts under way are expected to further streamline internal procedures. In Bosnia and Herzegovina a new law shifted responsibility for external connection works from the client to the utility. This cut 2 procedures for the customer. In Uganda the utility began outsourcing external connection works to registered construction firms, cutting connection times by 60 days.

Serving customers faster by improving working relationships with other public agencies was the aim of the initiative by the utility in Hong Kong SAR (China).[15] The performance pledges developed by the working group it formed are expected to reduce the time for the utility to obtain an excavation permit from 2 months to 23 days.

Changes to the system for checking internal wiring can also cut connection delays. Moldova eliminated duplication in inspections. Before, both the utility and the State Energy Inspectorate inspected internal wiring installations, effectively doing the same job twice. Now only the State Energy Inspectorate inspects the installations.

Trinidad and Tobago clarified connection costs through a new capital contribution policy that took effect in August 2009. Before, connection costs were calculated case by case, making it difficult for customers to assess whether they were charged too much or not. Now the utility bears the connection costs, then distributes them across all customers through clearly regulated consumption tariffs. This reduced the connection cost for the *Getting Electricity* customer in Port of Spain by 52% of income per capita. More important, the new policy increased the transparency of connection costs for customers.

Important improvements substantially increased the electricity supply in 2 postconflict economies, Afghanistan and Sierra Leone. Customers that would have had no choice before but to buy their own generator can now obtain a connection to the local electricity network. In Afghanistan a new transmission line is bringing electricity from neighboring Uzbekistan to Kabul. In Sierra Leone a long-awaited hydroelectric power project started generating electricity, bringing more power to Freetown. An entrepreneur running an internet café in western Freetown reports that 1 month's electricity supply now costs him what he used to spend for 4 days of power from a generator. But, he says, there is room for improvement.[16] Connection costs went up, and wait times remain long as utilities in both countries work through a backlog of connection applications.

WHAT'S NEXT?

This annex presents findings on the kinds of constraints entrepreneurs in 176 economies face in getting access to electricity and illustrates patterns in connection processes. By measuring the procedures, time and cost for obtaining a new electricity connection, *Getting Electricity* allows an objective comparison from the perspective of businesses (table 12.3). And it provides insights into the efficiency of distribution utilities and the environment in which they operate. Feedback from governments and utilities on the *Getting Electricity* indicators and the findings presented in this report is welcome and will be used to further refine the methodology.

Electricity connections are provided by distribution utilities that retain monopolistic positions even in otherwise liberalized electricity markets. Businesses and other customers are therefore captive to the utility. By providing data for benchmarking, *Getting Electricity* can benefit these distribution utilities and their customers. With more economies included next year and more years of data, *Getting Electricity* can help identify good practices that can inform future efforts to improve interactions between utility service providers and businesses.

TABLE 12.3
Getting electricity data

Economy	Procedures (number)	Time (days)	Cost (% of income per capita)
Afghanistan	4	191	5,768.2
Albania	5	162	614.9
Algeria	6	119	1,430.4
Angola	8	48	1,278.5
Antigua and Barbuda	4	42	132.2
Argentina	6	74	25.2
Armenia	8	242	787.0
Australia	5	81	9.5
Austria	5	23	113.0
Azerbaijan	9	241	658.0
Bahamas, The	7	101	101.5
Bahrain	5	90	67.0
Bangladesh	7	109	2,762.0
Belarus	7	254	1,383.0
Belgium	6	88	96.7
Belize	5	66	369.4
Benin	4	172	15,452.0
Bhutan	5	225	1,493.9
Bolivia	8	42	1,297.3
Bosnia and Herzegovina	8	125	535.6
Botswana	5	121	495.3
Brazil	6	59	150.5
Brunei Darussalam	5	86	46.7
Bulgaria	6	137	381.5
Burkina Faso	4	158	14,901.3
Burundi	4	188	36,696.7
Cambodia	4	183	3,581.5
Cameroon	4	67	1,846.0
Canada	8	168	152.3
Cape Verde	5	58	1,217.5
Central African Republic	6	210	13,298.3
Chad	5	66.5	14,719.8
Chile	6	31	82.8
China	5	132	755.2
Colombia	5	165	1,182.7
Congo, Dem. Rep.	6	58	27,089.4
Congo, Rep.	5	55	7,647.2
Costa Rica	5	62	316.7
Côte d'Ivoire	5	44	4,137.0
Croatia	5	70	327.5
Cyprus	5	247	88.9
Czech Republic	6	279	187.2
Denmark	4	38	128.2
Djibouti	4	180	10,008.1
Dominica	5	73	1,187.7
Dominican Republic	7	87	405.3
Ecuador	6	89	899.4
Egypt, Arab Rep.	7	54	499.9
El Salvador	7	78	522.2
Eritrea	5	59	4,156.7
Estonia	4	111	229.1
Ethiopia	4	75	3,734.8
Fiji	6	57	1,209.2
Finland	5	53	33.9
France	5	123	39.6
Gabon	6	160	316.8
Gambia, The	4	178	6,526.3
Georgia	5	97	759.4
Germany	3	17	51.9
Ghana	4	78	2,423.5
Greece	6	77	57.5
Grenada	5	49	370.2
Guatemala	4	39	655.5
Guinea	5	69	13,275.4
Guinea-Bissau	7	455	2,133.5
Guyana	7	109	568.5
Haiti	4	66	3,345.3
Honduras	8	33	1,109.9
Hong Kong SAR, China	4	93	1.9
Hungary	5	252	126.5
Iceland	4	22	6.6
India	7	67	400.6
Indonesia	7	108	1,350.0
Iran, Islamic Rep.	7	140	1,108.4
Ireland	5	205	86.6
Israel	6	132	12.6
Italy	5	192	332.9
Jamaica	6	86	222.5
Japan	3	105	0.0
Jordan	5	43	323.8
Kazakhstan	6	88	111.3
Kenya	4	163	1,449.6
Kiribati	6	142	4,297.0
Kosovo	7	60	910.1
Kuwait	7	36	63.4
Kyrgyz Republic	8	337	2,111.1
Lao PDR	5	134	2,734.3
Latvia	6	198	405.2
Lebanon	5	75	23.9
Lesotho	5	140	2,664.0
Liberia	4	586	5,294.1
Lithuania	4	98	46.0
Luxembourg	5	120	66.1
Macedonia, FYR	5	151	34.5
Madagascar	6	419	8,268.0
Malawi	5	244	11,703.7
Malaysia	6	51	55.8
Maldives	6	101	761.6
Mali	4	120	3,877.9
Marshall Islands	5	172	6.5
Mauritania	5	80	7,591.9
Mauritius	3	59	212.7
Mexico	7	114	436.0
Micronesia, Fed. Sts.	3	75	519.9
Moldova	7	140	796.0
Mongolia	8	156	1,261.7
Montenegro	5	71	458.0
Morocco	5	71	2,725.5

TABLE 12.3
Getting electricity data

Economy	Procedures (number)	Time (days)	Cost (% of income per capita)
Mozambique	7	87	2,523.9
Namibia	7	55	576.6
Nepal	5	74	2,370.7
Netherlands	5	143	29.5
New Zealand	5	47	66.8
Nicaragua	6	70	1,768.4
Niger	4	120	4,419.9
Nigeria	8	260	1,180.3
Norway	4	66	7.3
Oman	6	62	66.3
Pakistan	6	266	1,829.2
Palau	5	125	132.7
Panama	5	35	9.9
Papua New Guinea	4	66	2,230.3
Paraguay	4	53	287.5
Peru	5	100	500.0
Philippines	5	63	479.2
Poland	4	143	303.4
Portugal	5	64	57.3
Puerto Rico	5	32	428.6
Qatar	3	90	5.1
Romania	7	244	544.7
Russian Federation	9	302	4,671.7
Rwanda	4	30	5,513.6
Samoa	5	23	881.9
Saudi Arabia	4	71	21.3
Senegal	7	125	6,018.5
Serbia	4	131	574.7
Seychelles	6	147	565.6
Sierra Leone	8	137	2,914.1
Singapore	4	36	33.9
Slovak Republic	5	177	197.5
Slovenia	5	38	122.9
Solomon Islands	4	39	2,244.6
South Africa	4	214	1,780.4
Spain	4	101	229.8
Sri Lanka	4	132	1,381.6
St. Kitts and Nevis	5	18	377.1
St. Lucia	4	25	212.6
St. Vincent and the Grenadines	3	52	280.7
Suriname	5	58	795.3
Swaziland	6	137	1,472.2
Sweden	3	52	21.8
Switzerland	3	39	70.7
Syrian Arab Republic	5	71	1,045.9
Taiwan, China	4	23	56.8
Tajikistan	9	224	1,240.9
Tanzania	4	109	265.3
Thailand	4	35	86.3
Timor-Leste	3	39	7,389.0
Togo	4	89	6,020.7
Tonga	5	50	115.1
Trinidad and Tobago	5	61	2.5
Tunisia	4	65	1,062.8
Turkey	5	70	714.3
Uganda	5	91	5,793.4
Ukraine	11	309	275.6
United Arab Emirates	4	55	18.6
United Kingdom	5	111	43.3
United States	4	68	16.9
Uzbekistan	9	117	2,070.8
Vanuatu	5	257	1,200.1
Venezuela, RB	6	125	1,461.3
Vietnam	5	142	1,536.0
West Bank and Gaza	5	63	1,560.6
Yemen, Rep.	4	35	4,973.4
Zambia	5	117	1,250.5
Zimbabwe	6	125	6,511.9

Source: Getting Electricity database.

1. World Bank (2009c), comparing the ease of doing business across 10 cities in Russia, shows that dealing with construction permits is more complex in Moscow than in the other cities in part because of differences in the number of procedures required to obtain an electricity hookup.
2. According to the survey data, which cover the years 2006–09, 15.2% of managers consider electricity the most serious constraint, while 15.68% consider access to finance the most serious (http://www.enterprisesurveys.org).
3. See, for example, Calderon and Servén (2003), Dollar, Hallward-Driemeier and Mengistae (2005), Reinikka and Svensson (1999) and Eifert (2007). Using firm-level data, Iimi (2008) finds that in Eastern Europe and Central Asia eliminating electricity outages could increase GDP by 0.5–6%.
4. Foster and Steinbuks (2009).
5. Lee, Anas and Oh (1996).
6. The report is available for further comments on the *Doing Business* website (http://www.doingbusiness.org). A final draft of the methodology paper is under preparation.
7. Geginat and Ramalho (2010) find that connecting a new customer to electricity takes more than twice as long on average in low-income economies as in high-income ones. They find that the differences can be explained in part by the overall level of bureaucracy in an economy, especially where utilities are majority state owned.
8. Th. H. (translated by Cong Dung), "83% of Electrical Wiring Fails to Meet Quality Standards," *Saigon-GP Daily*, May 19, 2010, http://www.saigon-gpdaily.com.vn.
9. U.S. Fire Administration (2008).
10. Srinivasan and Turlakova (2010).
11. By comparison, the demand of a residential connection is about 20 kVA.
12. Detailed information on cost components for each economy can be found on the *Doing Business* website (http://www.doingbusiness.org).
13. The number of economies where utilities charge security deposits does not include those where security deposits are rolled over into consumption bills for the first 3 months (Malaysia and the United States).
14. Although *Getting Electricity* records only the present value of the interest lost on the security deposit, even those amounts can be high—in Haiti, as high as $11,421. On average, the present value of the interest lost on the security deposit accounts for 13% of the entire connection cost for the customer.
15. GovHK, "Process Review: Application for Excavation Permit," http://www.gov.hk/.
16. Fid Thompson, "Sierra Leone's Hydro-Power Dam Lighting Up Freetown," *VOA News*, February 10, 2010, http://www1.voanews.com/.