

Switch On Episode 2: Urban Grid Expansion Transcript

0:00:15.440

Scott Tinker: How far does the park go?

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Speaker 1: It's about four thousand, two hundred kilometers square

0:00:20.240

ST: Wow.

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S1: It's quite big actually.

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S1: Wow. The sun is out. Beautiful.

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Welcome to the African sunrise

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ST: Thank you.

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S1: It's different huh?

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ST: It's just amazing to have this Savannah so close to the...

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S1: To the city. Four a half kilometers away.

0:00:43.040

ST: I've come to Kenya to learn about expansion of the electric grid. Nairobi, the capital, is rapidly growing, as are cities throughout the developing world. More than 100 million people move to cities each year in search of employment and other opportunities, and many of them settle in slums. In fact, one billion people now live in informal settlements. Governments are

striving and often struggling to provide electricity to these new citizens to help improve their lives. Expanding the grid into the slums sounds like it should be easy since existing infrastructure is nearby, but the many unexpected challenges that Kenya Power is facing here trying to electrify Kibera one of Africa's largest slums, are the same faced across the developing world as cities try to expand their electric grids. There are nearly 3 billion people today who still live with little or no energy and what I want to know is how they'll finally get it. So this is sort of what it was. That's the future.

0:01:51.680

Speaker 2: That's the future.

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I'm Scott Tinker and I study energy. Come with me around the world to meet people and communities as they 'Switch On.'

To learn about Kenya Power's initial steps in Kibera, I talked to their Principal Marketing Officer, Jael Mwadiloh.

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Jael Mwadiloh: We have people who call themselves cartels. The cartels moved in and they started selling power to their lockers.

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ST: So the electricity is illegal.

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JM: Yeah, we used to have illegal power. That's why we came in here. We moved in we could not communicate to anybody here because they didn't want to see strangers around. You know they they look at the government security as they are like enemies to them.

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ST: Really.

0:02:56.080

JM: Yeah, yeah.

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ST: When was, Jael? What year about was this?

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JM: Three or four years ago.

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ST: Three or four years ago?

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JM: Yeah. it was very difficult for us to convince

0:03:06.239

the cartels to join us because, you see, they were getting a lot of money. We had to talk to them. We engaged them. We elected them as the village elders.

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ST: Did that provide some jobs?

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JM: Yeah, we did. We gave them jobs. The elder had to get two teams to come and dig the holes and erect the poles. But our main aim was to change the lives of the people in the settlements, so we made sure that the amount of money we are charging them for every connection is affordable.

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ST: How does that work? How do people here pay for electricity?

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JM: We have kiosks where you can buy tokens.

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ST: Can we go see one of the kiosks?

JM: Yes.

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ST: How much does a month of electricity cost in a typical home?

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JM: Not much. Maybe a thousand.

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ST: So five or ten dollars per month, and can people afford that here?

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JM: Yeah, they can.

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ST: Hi, how are you?

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Speaker 3: I'm okay

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ST: So you can sell me a token?

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S3: Yes, that one is 2.6 for 100.

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ST: 2.6 units, so a dollars worth of electricity

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S3: Yes, okay.

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ST: Thank you.

Next I met with David Mwaniki, Kenya Power's Director of Infrastructure.

So I'm looking at the pole that the local people installed, working with Kenya Power right here.

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David Mwaniki: So what we are seeing is that each of that cable now goes to a household. Every house has a keypad just like a phone. So once you buy the units you buy, you get a code. You feed into the part.

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ST: In your own house.

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DM: And it is recorded the number of units. So once you use those units and they are over. Then after that now it switches you off.

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ST: So until your house has a unique code and that comes up to this switchbox

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DM: Yes.

0:04:57.759

ST: It gives you that many units of electricity.

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DM: And most of the residents don't have a regular income. They buy as they wish. Yeah, they buy as they wish.

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ST: Right next to it, mafuta taa, makaa. What does this say Swahili?

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DM: Mafuta taa is kerosene. They usually use it, some of them, could use it for lighting, or for the stoves. And also the stoves, also for cooking stoves. And the makaa is actually the charcoal. For each of these containers it's half a dollar.

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ST: So charcoal here we have kerosene there.

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DM: Yes.

0:05:27.199

ST: So this is sort of, what it was, still is, and that's the future.

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DM: Yes, that's the future.

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ST: So this is a school?

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DM: Yeah, it's a nice place to be.

0:05:39.199

ST: This school has been electrified. Just recently.

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DM: We've been able to electrify. We've been able to supply clean energy to the residents here. We improve their quality of life, you know, there are people who are the lower end of the economic scale. There are people, who once they get clean energy, there are a lot of other benefits besides the houses. It's all the public lighting. So the public lighting improves the security, especially for women. It's very safe, isn't it. Especially the informal businesses, you find most of them are by women. They ensure us that there's more hours of business and increases the incomes at the household level.

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ST: So from illegal electricity, no roads, and very little infrastructure, to poles, lines, roads. It's phenomenal

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DM: You can see now. It's phenomenal.

0:06:29.120

ST: Did you grow up with electricity when you were young? Did you have electricity?

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DM: No, I didn't. I had no interaction with electricity during my holidays for studying at home we do kerosene lamps. And also in school, it was the same thing. Until I went to high school, actually. That is when I was able to interact with electricity. Like I said, it's just by accident that I became an electrical engineer.

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ST: That's perfect.

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DM: Yeah, that's a transformation rather, yes.

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ST: Yes, but that's the opportunity that these kids will have.

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DM: Yes, yes and to serve Kenyans in this capacity, I think to me, it is a good opportunity.

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ST: You're the head of infrastructure for all of Kenya Power. It's a big job.

0:07:08.080

DM: Yes, it is very challenging also.

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ST: How much of the electricity, not just here, but broadly across Kenya, is still illegal? How much work is still needed to be done?

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DM: What we are seeing is our losses are about like 20 percent. 20 percent of the energy cannot be accounted for.

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ST: Only 20 percent?

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DM: Only 20 percent.

0:07:33.360

ST: For an outside perspective, I met with Eric Mwangi, an independent consultant to the Ministry of Energy.

There's a virtuous cycle that can go on: electricity comes, people start to improve their jobs. They make more revenue. They can pay their bills. This is all good. But getting there has a lot of challenges.

0:07:48.160

Eric Mwangi: That's where the rubber meets the road. So what is the experience of somebody who's just been connected? You know, maybe, you've been using a coal iron, and cooking with firewood or whatever. And you now have an electricity connection, but if that power shorts twice a week, twice a week...

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ST: That wood looks pretty good.

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EM: Yea, so it damages your appliances. Your fridge now is not working properly. You go back to how you were living before.

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ST: Or if I can't pay that electric bill because that costs a lot of money.

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EM: The irony is, I mean, if you look at the bottom of the pyramid where you would have affordability issues, the per unit cost of energy is so much higher. Between your kerosene, your firewood, your charcoal-they pay three four times what an upper income family would have. So the best way to reduce the costs is to give them a steady supply. And a reliable supply, and they will change the way they live.

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ST: We visited one of the major urban slum areas, Kibera, but starting to see electricity. Tell me a little bit about that. How's that going?

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EM: It's a tricky issue because...

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ST: Still some illegal line tapping going on?

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EM: Lots of that. Lots of that. So you have one connection supporting, you know, multiple homes. Brings up issues of safety. So you do get reports of electrocutions. It brings up issues of great stability because you have overloads, and the infrastructure can't support the loads that are being put on the network. Again, it gets to a point where it becomes a part of the communal understanding of, "This is how we live." So it becomes very difficult now. Several years later to say, "Well, you've not really been paying for this connection," or "You've been paying, but you've not been paying the utility..."

0:09:51.920

ST: Yeah yeah.

0:09:53.760

EM: "for the connection." And that's still a big sticking point.

0:10:03.519

ST: Well thanks for meeting me this morning.

You grew up here your whole life, huh?

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William Opiyo: Yeah, my whole life.

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ST: William Opiyo is one of the local leaders that Kenya Power identified to help install power lines and connect residents to the token system so they could buy electricity from Kenya Power. This is one of your crew?

0:10:21.279

WO: Yeah, yeah.

0:10:23.760

ST: But when I visited, they were removing the cartel's power tabs. Where did they learn how to do this?

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WO: Here in Kibera.

0:10:30.839

ST: Here in Kibera?

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WO: Yes.

0:10:40.240

ST: Here he goes. So that's a Kenya Power box?

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WO: Yes.

0:10:46.720

ST: So he would be removing illegal connection?

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WO: Yes. And the cartels found that we have erected poles, we want to remove them from the power.

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ST: Yeah.

0:10:59.360

WO: They started chopping the droppers, so that they can fix their power.

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ST: So Kenya Power put in the poles and brought legal electricity, and then the cartels said, "No, we'll tap into it with drops."

0:11:14.160

WO: Yeah

0:11:15.120

ST: Illegally. Can we see one of those here or not? Can you point to the illegal wire? Can I tell which one it is?

0:11:25.920

WO: I can see.

0:11:27.839

ST: Which one?

0:11:29.519

WO: That one is illegal connection.

0:11:31.120

ST: Which one are we looking at? Right here? Okay.

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WO: That one is illegal connection. Even that one.

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ST: And this one. So there's still a lot of illegal connections.

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WO: Yes.

0:11:43.360

ST: Is it half illegal? Or more or less?

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WO: More.

ST: More than half is illegal?

0:11:47.839

WO: Yeah, yeah.

0:11:50.800

ST: Still? Okay, and the reason that's still there? Like why doesn't somebody go take it down?

0:11:54.839

WO: Somebody?

0:11:57.279

ST: Who? Who would do it?

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WO: We are the one who we are supposed to do it.

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ST: You?

0:12:04.639

WO: Yes, to remove all illegal connections. They told us that they don't have money to pay us, so that we can do this work.

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ST: So let me make sure I understand. The partnership was there for a little while, using you and a local team.

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WO: They are still using, but they are not paying us.

0:12:27.279

ST: That's a good deal. So what do the people feel about that? If we were to go in and ask somebody, what do you think about the cartel, or Kenya Power, what would they say? Do they know?

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WO: They want token, but Kenya Power, they didn't do enough job for people to enjoy power.

0:12:48.560

ST: Okay, so it started, but it didn't finish.

0:12:51.120

WO: Yeah, yeah.

0:13:04.839

ST: Wow.

So William, these are homes?

0:13:12.240

WO: Yeah, there are eight.

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ST: Eight homes and families within each one.

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WO: They are using illegal connection.

0:13:18.880

ST: All stolen.

Hello, I'm Scott.

0:13:28.079

Dominic: Dominic

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ST: Dominic, it's nice to meet you. Thanks for letting us come into your home today and visit.

0:13:32.800

D: Yeah.

0:13:35.120

ST: I can see you use a lot of electricity. What's this? What's this right here?

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D: But it is not completed.

0:13:44.079

ST: What is it?

0:13:46.560

WO: They removed all sockets, so that he can use for illegal connections.

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ST: Oh this was Kenya Power's. And it's empty? And this is the illegal?

0:13:57.279

WO: Yeah, illegal.

0:13:58.800

ST: Have you ever had an electrical accident? Like you got shocked?

0:14:03.519

D: Oh yes.

ST: Yes?

0:14:06.720

D: Oh yes.

ST: So it's not very safe?

0:14:09.120

D: It's dangerous.

0:14:11.600

ST: You're laughing because it's scary.

0:14:12.720

WO: Even now he's using, up you see.

0:14:16.240

ST: Oh I see. Yes, that looks pretty scary. Those are all wires hooked up into aluminum roof.

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WO: If you remove that wire, the light will go off because he's using a live wire from the pole. Yeah, yeah.

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ST: Okay. I mean, tell me, what happens with illegal power like that. What are the concerns?

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WO: You know, the cartels used to take a live wire only.

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ST: Live wires.

0:14:44.639

WO: There is no neutral. So they put neutral under the ground.

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ST: Okay, so there's a hot wire coming off

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WO: Yes.

0:14:54.800

ST: That's got to have killed people.

0:14:56.160

WO: Yeah, yeah. So many people are dying because of that. Even dogs, cats, children.

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ST: Children. So when it rains, everything is metal

0:15:08.480

WO: Yeah. Even this house. You touch this house...

0:15:09.519

ST: Boom.

0:15:12.000

WO: Yes.

0:15:12.959

ST: Wow. How long would it take if, let's say, Kenya Power came in and said, "Alright William, get your team go remove all the illegal power in Kibera." How long would that take?

0:15:28.079

WO: Three months.

0:15:28.720

ST: Three months?

WO: Yes.

0:15:35.080

ST: Wow.

You just were up on this pole. What were you doing up there?

0:15:50.399

Speaker 4: Up there, I have been found there is two meters. They have been disconnected, and they get them back to the normal way.

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ST: Back to tokens.

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S4: To tokens, yeah.

0:16:00.160

ST: I'm trying to understand the relationship between the cartel and Kenya Power. Is there pressure from the cartel on Kenya Power?

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S4: There's pressure on both sides. If you can see cartels, you know these people will stay together. Some of them were in the neighborhood.

0:16:16.560

ST: Right.

0:16:18.480

S4: Don't you see?

ST: Yes.

0:16:20.800

S4: And yet somebody like me, I can't come out because I'm working within the KPLC. And I can come out to go to disconnect the illegal connections.

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ST: Right. Does that put you at risk?

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S4: Yeah, it's too risky. You see the cartels, they organize themselves, they come together. Like now, the way we are now. You're just walking through your work. You just come in between the crowd of people with the pangas, knives, sharp objects. You see, they start now beating you. And yet you are unaware. You see? So from there even you can go to the office. You can even find there is a record there.

0:16:57.440

ST: Right.

0:16:58.959

S4: Even especially, our boss. There is even a day that he has been threatened. Even can be even shoot by a gun. Yeah, it's even a day we have been staying to his home overnight day and night. Taking care of him because of the cartels. They say that they will come to attack him overnight.

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ST: What do you think the apartments and the businesses want? Do they have to work with a cartel because they're scared? Or would they prefer to get their power from Kenya Power?

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S4: You can find some DC drop in tokens, of the tokens come to a house like this one. You can see cartel come with a panga, they cut it off. So if you cut it off, he come to the patient and ask, "Do you see now, you don't have electricity?" "Don't you see your neighbor's electricity?" "Why don't you come to me?" "Forget about Kenya Power." "Use this one." "Mine is always on."

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ST: So this is a battle between cartel and Kenya Power

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S4: And Kenya Power and house.

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ST: And you're stuck in the middle?

0:17:58.559

S4: Yeah. And you see the challenges with this.

0:18:03.039

ST: You grew up here in Kibera?

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S4: I was born in Kibera. Up to date, I'm still here. Got three kids. If I can talk even in front of God, I don't have a single cent in my pocket. I don't know even know what I'm going to eat for lunch. Do you see that's a very big challenge? And yet we work with a very big company. Kenya Power company.

0:18:27.039

ST: When was the last time you were paid?

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S4: Payment of us. The last repayment was last year, May.

0:18:30.240

ST: In May.

0:18:33.280

S4: And up to date, can you imagine that?

0:18:36.559

ST: Seven months without pay.

0:18:38.160

S4: Seven months without payment. We have hours to rent. Still now, I have almost about 16,000 house rent. If I don't have all that money to pay down I'll be kicked off.

0:18:48.480

ST: With your family. Three kids.

0:18:51.679

S4: With my family. You see now? Maybe you can be our good guys, who can go there talk for us. Ask them, what was the reason why.

0:19:04.000

ST: We'll do what we can to help.

Had these workers really not been paid in seven months? I went to see Geoffrey Kigen, Kenya Power's Head of Security Services, to try to find out.

Hello, how are you? Geoffrey, thanks. We visited with David and Jael a couple days ago in Kibera. It was very positive. We went back today to visit again. Many of the boxes on the poles had been tapped around and so the cartel had come back with some illegal connections and so we wanted to come visit with you and make sure we just understood your perspective on that.

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Geoffrey Kigen: There's a cartel that when we connected people legally, we push them out of business, and, unfortunately, they're coming back because they want to gain from power connections. So they force you not to use the legal power.

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ST: The people there.

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GK: The people there. Because actually they control the villagers anyway, so then anything good that comes to the slum, including water, including every other..

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ST: All the services.

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GK: Specifically have to be coordinated by them, so then we have agents those villages, village headman, or the cartels, I'm very careful using that word 'cartels.' So then they become appointed people in those slums

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ST: People on the inside.

0:20:45.039

GK: We want to have agents out of these people to be our casual contractors. For them to earn a commission for safe power connections to ensure that everybody is connected or rather is consuming power- the legal power- as opposed to the other one in their area. In the areas they control the more people you bring on board, and the more revenue that comes, the more the commission.

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ST: You know, we were just there this morning, and there was a group of 15 or so young men that went with us. They were our security but they were also, or at least in the past, they had been people working on commission, or on contract for KPL, and they were the ones taking out illegal connections and putting in the legal, but they said that progress has slowed a lot. They aren't able to do that as much. Are you familiar with their efforts?

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GK: Yeah, I think, that was a small amount, number of people. We have more than four hundred thousand connections.

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ST: Oh wow. Okay.

0:21:55.200

GK: Within those illegal, rather informal, settlements across.

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ST: 400,000 connections in Kibera alone?

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GK: Not Kibera alone, all the slums, or other informal settlements, within Nairobi there are several.

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ST: So four or five people per connection, that's a couple million people.

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GK: Yes, and that is why I was saying the commission is not a small fee because if all of them will actually consume and agree on a percentage, it will be a reasonable amount for them to be able to assist us.

0:22:24.240

ST: Yeah, it seemed like there was almost a two steps forward, all the things went in, and then one step back. And now you're trying to take another two steps forward.

0:22:32.559

GK: Bring it back. The reason why we moved in and invested what was invested there was to ensure they have that safe power. Then of course revenue comes as a result.

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ST: Yeah, a win-win-win. When do you plan to begin this new next phase? Is that starting to happen now?

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GK: Yeah, that is something that is currently under discussion. You see it's a new phenomenon. We thought we had directly eradicated the problem, but I think the surveillance bit, maybe we dropped the ball somewhere. So we want to pick it up yeah again so then now we counter that problem before it takes something back to zero.

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ST: Geoffrey, thanks I appreciate our visit.

0:23:16.320

GK: Thank you so much.

0:23:21.440

ST: So what exactly is going on here? I'm still not sure I figured it out, but I think it's something like this: Informal settlements, like Kibera, lack formal government or utilities, so informal governments- cartels- spring up to provide and sell those utilities like water or stolen electricity. Kenya Power paid the cartels to put power lines on cartel turf.

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JM: We had to talk to them. We engaged them. We elected them as the village elders.

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ST: If I understand it right, those new village elders were part of the cartels and may still have some connection to them. But working with them has allowed Kenya Power- outsiders- to sell electricity in Kibera to people who were once the cartel's customers.

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GK: When we connected people legally, we push them out of business, and they're coming back.

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ST: The cartels then cut those connections and use Kenya Power's grid system to sell Kenya Power's electricity for their own profit.

0:24:22.480

WO: That one is illegal connection

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ST: Which one are you looking at?

0:24:24.640

WO: That one.

ST: Right here.

0:24:27.120

WO: Without communication cable, that is illegal connection.

0:24:29.039

ST: For Kenya Power, it was a double cross. For the cartels, it was smart business. For Kibera residents, instead of paying by the token for safe electricity, they pay the cartels a flat rate.

I can see you use a lot of electricity.
But at the risk of electrocution from unsafe connections.
I mean that's got to have killed people

0:24:50.960

WO: Yeah, yeah. So many people are dying.

0:24:54.080

ST: This leaves local leaders and their crews somewhere in the middle, they got paid by Kenya Power to install the lines. Now they're removing the cartel's connections and getting threatened for it

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S4: You see, the cartels they organize themselves. They come together with the pangas, knives, sharp objects. You see, they start now beating you.

0:25:13.760

ST: Though I had to wonder who was installing the cartel's connections. Could they be paying the crews with the gear and expertise, who now aren't getting paid by Kenya Power? Does the cartel pay you to keep those there?

0:25:26.080

WO: No, no, no, no, they don't pay me. I was being paid by Kenya Power to remove illegal connections.

0:25:37.200

ST: So now you're not paid at all.

So what is Kenya Power to do? Do they push in and pay local crews to disconnect all the cartel connections? And, if so, how will the cartels respond? What needs to happen for the illegal electricity to go away?

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WO: Kenya Power must come strongly to support us.

0:25:51.360

ST: Or does Kenya Power charge the cartels for the electricity going into the slum and let them worry about selling it to residents? Or cut off electricity to the Kibera lines to cut their losses.

0:26:01.840

DM: Our losses are about like twenty percent. Twenty percent of the energy cannot be accounted for.

0:26:08.880

ST: How will the residents cope if these struggles make electricity more expensive? Or more dangerous? Or less available? These are all important questions for any government, or utility trying to distribute electricity to the one billion people now living in slums around the world. The infrastructure will be the easy part. Minimizing corruption and working with local power structures and residents in culturally effective ways to forge a lasting win-win for all involved, those are the real challenges.