ELECTRICITY POLICY
ELECTRICITY DAILY

'Lighting the World'— An Interview with Former Duke Energy CEO Jim Rogers

Electricity, lifeblood of modern society, is—or should be—a basic human right. There's a business case to be made for bringing it to the 1.2 billion people who lack it. Everyone wins if we help lift kWh-poor economies and their people out of poverty.

By Leah Y Parks and James E. Rogers, Jr.

‘Lighting the World’— An Interview with Former Duke Energy CEO Jim Rogers

Electricity, lifeblood of modern society, is—or should be—a basic human right. There’s a business case to be made for bringing it to the 1.2 billion people who lack it. Everyone wins if we help lift kWh-poor economies and their people out of poverty.

By Leah Y Parks and James E. Rogers, Jr.

EP: What led you to start providing electricity to some of the world’s 1.2 billion people who don’t have it?

JR: The triggering event for me happened when I was in Kenya in 2010. I was talking to a young man with a cellphone in a village with no electricity and I asked him how he charges his phone. He said through a translator—I don’t speak Swahili—that he walks three hours, pays someone to charge it, and then walks back. I was struck by this—the labor and the inefficiency. That prompted me to start thinking more deeply about the significance of electricity in people’s lives.

When I came back to the US I spent the Christmas holidays with a very good friend of mine in Colorado where I love to ski and hike in the mountains. We started kicking ideas around and within six months we had launched the Global BrightLight Foundation and we have since supplied 70,000 solar lanterns to people in remote areas around the world.

This interview explores the challenge of bringing electricity to the 1.2 billion people on Earth who lack it. **James E. Rogers, Jr.** *was president and CEO of Duke Energy, the largest electric utility in the US, from 2006 until 2013. His book,* “Lighting the World,” *published in 2015, asserts that access to electricity should be a basic human right.* **Leah Parks** *is associate editor at ElectricityPolicy.com and is co-author with S. David Freeman of* “All-Electric America: A Climate Solution and the Hopeful Future,” *published in 2016.*

We started it as a charitable foundation and then turned it into a money-making non-government organization, reinvesting all profits into growing the foundation.

That triggered some other things, including chairing the Global Sustainable Electricity Partnership Summit. That includes 11 of the largest utilities in the world. As chairman I made global electricity access one of the key issues of the Summit, which was held in D.C. Bill Clinton kicked it off and we closed it with the World Bank President Jim Yong Kin. Both of them said we needed to do more in this area. I continued going deeper and deeper into exploring the subject.

EP: What motivated you to write your book, "Lighting the World"?

JR: I first started traveling to Africa in 2010 and was struck by the need. You can't avoid seeing how limited life is in Sub-Saharan Africa for the millions and millions with no electricity.

My travels recalled Robert Caro's books on Lyndon Johnson and Texas in the 1930s. It really impressed me how, in rural Texas, especially the farms and ranches, the lives of women were transformed by the coming of electricity. They had light at night, and more.

Reading about this as a young utility CEO a zillion years ago, it inspired me and gave me a sense of purpose. It motivated me to know that I was helping to transform the lives of people by providing electricity to their homes and businesses.

My recent experiences in Africa, reinforced by those experiences of 20 years before, gave me a sense of the way forward for the 1.2 billion people whose lives are so limited by the lack of electricity. It shook me up, profoundly. I decided to write a book to share what I had learned.

Having written the book and got a sense of what is possible for communities without electricity, I am even more committed. In fact, only after writing the book did I feel a deepened sense of the challenge. In some respects, writing the book was the tuition I paid—the price of admission for the right to talk about the subject.

This book is part of my journey. Vary rarely in life does lightning strike and all of a sudden you wake up and you say, "I am doing this" or "I believe in that." It's often a series of things that help guide you to the way forward. This has been a journey for me and writing the book is part of it. It's a milestone on the road I am now on.

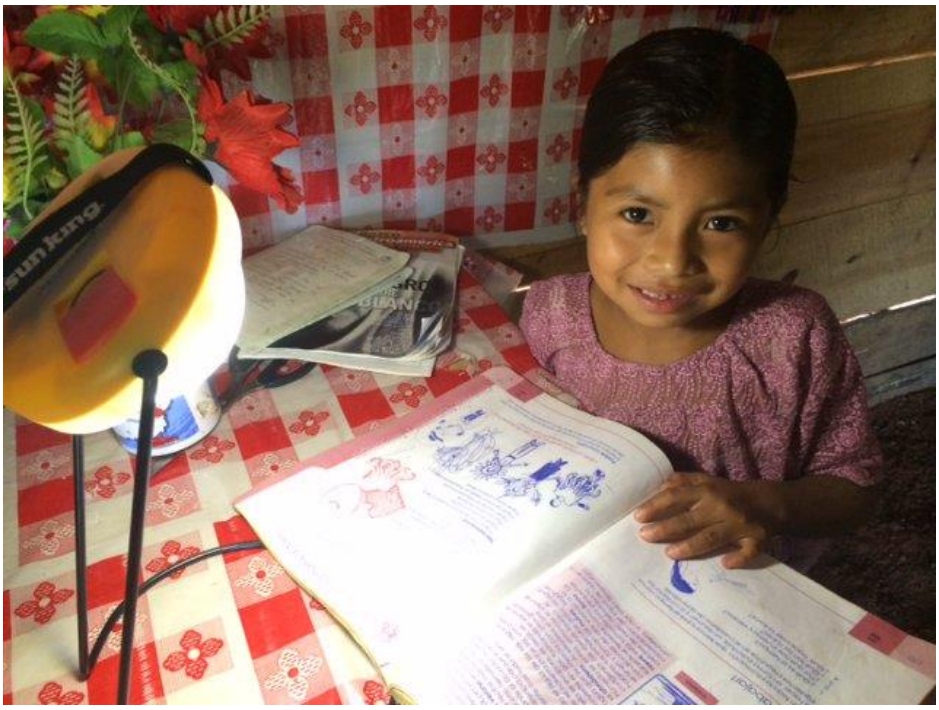
EP: In what parts of the world have you been working?

JR: Global BrightLight Foundation has distributed solar lanterns with cell phone charging capability in Rwanda, Uganda, Zambia, Nepal, Peru, Bolivia, Haiti, and Guatemala. But I have been more focused on East Africa. I recently spent more time in Kenya.

Duke Energy did projects in Latin America, specifically in the rural areas in Patagonia. The cultural differences between India and sub-Saharan Africa are significant. The village systems, the difficulties of providing electricity, and the governments' roles are quite different.

EP: Why is it important to bring electricity to the 1.2 billion people who don't have it? What should high-income nations know about why it's important?

JR: When 17 percent of the people on the planet have no access to electricity, it's very hard for us in the developed world to imagine how they can live a life of opportunity—something more than just subsistence. We don't really get it. I don't mean to be critical. It's just a blind spot for us. It's a blind spot because most of us have never lived without electricity. It is ubiquitous in high-income countries and we can't understand how basic a hindrance this is—this thing that's missing.



Electricity is fundamental to economic development, to education, to health care—even to efficient farming. It's fundamental to living in the 21st century. It influences the quality of life and how long you live.

Organizations who talk about lifting people from poverty don't talk enough about electricity. At the end of the day, access to electricity is what leads to economic development and the ability to address educational and health care issues. It is an enabler.

Looking at changes in the 20th century in the United States, it was the advent of electricity that transformed our lives. Most people in the US have had electricity access for the past 70 years. Some had access 100+ years ago.

When I started writing the book, I talked about "developing countries" but soon decided that term is not helpful for the conversation; "developing" is a loaded word. I changed the terminology to "low-income" and "high-income" countries because that engages people more constructively.

Electricity: A Basic Human Right?

EP: How is electricity driving changes in the world today—the digital economy and so on? Will low-income countries fall even further behind if they don't have it?

JR: I believe we must regard access to electricity as a basic human right. Having access to the Internet is fast becoming the same—the learning and the opportunities it opens up. Electricity was the high-tech industry of the early 1900s in the same way the Internet is the high tech industry today. The Internet may be far sexier to us today than the 100-year-old electricity industry, but electricity is essential for the Internet—and most everything else we do in our modern society today.

The best evidence of this blind spot is demonstrated by the UN's year 2000 millennium development goals: Access to electricity never made the list! This is the organization that's supposed to have the keenest understanding of poverty around the world, expertise in lifting people from poverty, promoting economic development, and improved access to healthcare. They just didn't get it.

Only now is the UN beginning to understand that access to electricity is a crucial factor in lifting people out of poverty. The UN recently did something smart, so it may be that we are finally entering the "dawn of awareness."

In September 2015 the UN listed electricity as number seven on its list of 2015-2030 sustainable development goals, behind No Poverty, Zero Hunger, Good Health, Quality Education, and Gender Equality. One could argue that some of these higher ranked goals are aspirational and desirable, but "Affordable and Clean Energy" is a necessary precursor to achieving those others.

The next step is for the UN to declare access to electricity a basic human right. Doing this will have a huge impact on how governments make policy decisions. If we call it a human right, countries will receive enhanced support and guidance and be better positioned to adopt policies that provide electricity in their rural areas.

EP: What about electricity's impact on women's health?

JR: That comes right out of Robert Caro's book and the story of how electricity lifted women from grinding poverty in Texas in the 1930s. Suddenly they could cook, clean, and read at night. What happened in Texas applies today to Africa and India and all over the world.

Bringing electricity to the villages will fundamentally transform the work that women do and their lives. It will eliminate hours of work and leave more time for education and business opportunities.

It may sound too dramatic, but I believe the single greatest inequality in the world is between those that have electricity and those that don't. Women will probably be the greatest beneficiary of access to electricity.

Business Models

EP: In Africa and much of Asia there is only sporadic grid connectedness, if there is any electricity at all. Most communities are off the grid. What do you envision for people living off the big grid.

JR: On-grid, but grid-off! There are about 1 billion people connected to the grid who have intermittent and unpredictable access. That in itself is a huge problem.

I think the bigger problem is that the world's 1.2 billion people have no electricity at all and almost all them live in rural areas. 1.2 billion is a hard number to get your head around. About 80 percent of the people in Africa without electricity live in remote areas, so the problem is predominantly an off-grid problem.

There is also a "high-income country" power bias by state-owned utilities that are owned and operated by the government. There has been a widespread belief in our international NGOs that coal plants, gas plants, and oil plants, in a traditional, centrally-generated system are the way to supply electricity. The World Bank, IMF, and OPIC (Overseas Private Investment Corp.) have reinforced that bias.

Take the World Bank for example. Virtually all its funding is given by high-income countries but only 1.5% of that goes toward rural electrification. By default, there's a reinforcement of the high-income country grid structure. It's not the only way—in fact, it's usually not the best way

The argument I try to advance in "Lighting the World" is that solar and storage are thoroughly modern 21st century power and appropriate to the particular setting.

EP: Is it feasible to bring solar and battery power to villages? The community's buying power must be quite small. Why not bring a transmission line to the village from a centrally generated plant instead?

JR: I believe it is cheaper and *more* feasible to build solar, perhaps coupled with storage, rather than try to replicate our capital-intensive 20th century power system. It's less environmentally intrusive, and puts people on what I call the "first rung of solar ladder technology."

As you move up the ladder of solar technology, you change the economic development trajectory of the people within the village and the village itself. Each rung—from the most basic solar lantern, to a community-sized solar microgrid—gives the village the opportunity to climb from one rung to the next.

An individual won't get 24/7 electricity on day one, but eventually access to even one lantern that extends a day's productivity—for learning, or cooking, or business—provides the opportunity to gain more wealth and the potential for advancement. The solar ladder has a series of rungs:

1. **Solar lanterns:** The first rung on the ladder is the inexpensive solar lantern. These have been distributed for free or sold all over the world.
2. **Solar lanterns + Charging:** The next rung is a solar lantern that also charges cell phones, which are as common in Africa as in the US. Global BrightLight's initial mission was solar lanterns that could charge one or two cell phones.
3. **Home Solar Systems:** On this rung a solar panel on the roof is used to charge several lights, with a phone charger attached, and perhaps a central battery system to hold the charge at night.
4. **Larger Home Solar Systems:** Larger systems may be powerful enough to run a blender, a computer, or a TV.
5. **The Microgrid.** The top rung is the microgrid. There might be solar on village rooftops and community solar as well. There would be some storage to firm up the system, or perhaps a backup diesel generator. Microgrids can offer full electrification to a village, and also provide sophisticated monitoring systems that track energy use and battery life.

Powerhive in Kenya is one of the most successful companies in the deployment of microgrids.

EP: How would the provider or vendor be paid?

JR: I am a great believer in a model where people pay. In Africa, the landscape is cluttered with technology that was given away and that no one knows how to fix when it breaks. People value what they pay for. They tend not to value what's given to them.

Of course, the capability to pay is limited. Over a billion people live on two dollars a day. But as their ability to pay goes up, you see them moving up the technology ladder. As people gain access to technology on the first rung of the ladder, they gain the capability to move the second and so on. For example, with the new solar light there may be more time to study or work into the evening, increase the possibility to earn money. If their solar light also charges their cell phone, that adds opportunity.

As people can climb the ladder on their own, they transition from buying products like a solar lantern to paying for an electricity service, like a microgrid.

Another aspect that makes this more affordable and practical is the increasing efficiency of devices like lights and cell phones, radios (which are so important), TVs, and refrigeration, etc. So with this efficiency curve and this ladder people can get more with less.

EP: Different groups have tried different ways of providing electricity, not always successfully. Many point to climate change as a reason to provide renewable energy. What business models would you suggest and how would they scale?

JR: In "Lighting the World" the model I propose for sparsely settled rural areas is for governments to create franchised areas because the market and the economy are so thin that full-on competition would be inefficient and couldn't be sustained. I didn't say it that way in the book because "monopoly" is a loaded term. But my idea is that countries auction off rural franchises" and have companies bid to serve them, based on performance goals written into the auction—for example, meeting certain coverage, service, and technology benchmarks.

This renewable-energy franchise model is the most affordable way to begin bringing power to these areas. With a franchise, the winning company will better be able to raise capital to do the job. In a way, it would be similar to the formation of rural electric co-ops in Texas in the 1930s.

But I did not want to make this a book about climate change. I wanted to make a book about business people who understand that, at the end of the day, you have to make this essential service—electricity—affordable. So I make the whole argument on affordability and not on climate change. That's a more compelling argument to leaders in low-income countries. It's about today's reality—not about a future problem they can't see. They have limited financial capability so they need affordable options.

EP: It makes sense to approach this from an affordability perspective. Are there any successful organizations out there that you can point to?

JR: There are many companies doing very good work. Another leader in East Africa is Off-Grid Electric in Tanzania. In writing this book I got to know the CEO, Xavier Helgesen, who is also doing great work. They are partly funded by SolarCity. Off-Grid Electric has a business model based on Africa's successful mobile banking model. In Africa 90 percent of the people have cell phones and about half have smart phones. That's how they pay for the phones and other services.

Off-Grid is also trying to sell electricity at a price that matches the payment scheme of kerosene, which electricity would replace. Kerosene is what poor people in Africa and Asia heat and cook and light with, but it's unhealthy and dangerous—causes fires and

smoke and health problems. And it's expensive.

One of the reasons this business model makes sense is that what you are doing is replacing kerosene in a lot of these villages. In developing a business model, you have to make the argument on the ability to pay and affordability. If people are already paying for kerosene, they can instead buy solar lighting with the same money. There are dramatic environmental and health benefits from the switch, but ultimately the argument is better made on the ability to pay and affordability.

People in Sub-Saharan Africa are now spending $10 billion a year on kerosene to light their homes. That's money that could be used for a cleaner, healthier, more scalable technology: solar.

One thing I didn't do in the book is do is rant about kerosene. A lot of people focus on the dangers of kerosene. What we should prefer to do is convince the kerosene dealer to move into selling solar. If you can replace their current earning stream with a new earning stream it's more likely they will move in that direction.

EP: Have you had contact with the kerosene dealers who might want to do that? It would make sense because they would already have the know how of how to distribute.

JR: Some kerosene sellers are starting to do that. The French company, Total, one of the most informed, is starting to move in that direction.

EP: You mentioned before that each country and each village is different. How do you approach the different communities with proposals for electric power?

JR: I believe that to be successful you have to go in with a mindset that you are there to listen. Then you have to observe and engage people in a conversation. We tend to think everyone wants electricity, but if you have not had it you may not realize its benefits and may not want it right away. Then, once you listen, you recruit people.

The best business models recruit people from the villages to work on a company's behalf. You also have to train people. Once you do that you also have to empower them to lead on these issues.

So, first you listen, then engage, recruit, train and empower. Then you have a formula that works because it enables and demonstrates a respect for the people. That's how I describe the approach. I don't say this explicitly in the book. My ideas are continuing to evolve.

EP: Are you investing in any particular company?

JR: A friend of mine asked me if I wanted to invest in his company. I said not right away, because I don't think it's appropriate to write a book and immediately turn around and invest in a company. But I think this process is helping me develop a deeper understanding. (Laughs) I say this book is like doing an assessment for a business plan. That's what you do when you decide whether to enter into a market.

What we are looking at here is developing ideas of how you can use scale to bring electricity to 1.2 billion people. Of course

over 100 years they may all get electricity, but should they have to wait three or four generations? The book addresses how to accelerate the process.

In almost every aspect of life we often have to go slow to go fast. We have the capability to accelerate through something once we come up with an idea or opportunity. People get turned on and passionate and jump in. But they are not as effective as they would have been had they slowed down in the beginning.

When you're passionate about something you almost always have to slow yourself down. It is more effective to work and think through a problem. Once you do this, your ability to accelerate is so much greater.

EP: When you describe your plan SolarCity comes to mind. Are you saying that some similar customer recruitment should be done for the 1.2 billion? Should one go from village to village, making sure there's a well-defined plan for doing it?

JR: That's the essence of it. The truth: I took the Rural Electrification Act of the 1930s as a model. But I knew the governments of low-income countries might not have the capability to backstop co-ops in quite the same way as we did in the U.S. That's why I married the approach to expansion with the idea of auctioning off franchises and creating, essentially, investor-owned utilities bidding for each franchise area. So I took two ideas and combined them in a different way than we have done in the U.S.

The Future of Electrification: Opportunities

EP: What are the opportunities, business and humanitarian?

JR: Bloomberg New Energy Finance published a statistic the other day that said that the market for kerosene worldwide is $27 billion. Compare that to the actual investment in solar in rural areas for electrification: It's just $511 million. That gives some perspective on how big that

market is, but also how nascent the efforts are today. I think this opportunity is enormous and the opportunity is only evolving.

Since the UN is giving greater importance to electrification, new business models are coming in. If you see the size of the market, you can imagine a great set of opportunities for lifting people out of poverty.

EP: What do you think the impact of the Paris agreements impact will be? Could it accelerate what we have been talking about?

JR: There's a quote that I love: "All change is overestimated in the short run and underestimated in the long term." I think Paris has already been a success in focusing everyone's attention on climate change and because of the number of countries that stepped up. Forget for a moment how binding it is. It is not going to please people who want it to go faster.

Paris was a success because you can't even get 190 people with the same religion and grew up in the same town to agree to anything. So the agreement of 190 people is a huge success.

The key to following through on Paris is technology. I take the greatest hope in governments and businesses really getting engaged and delivering the technology that will allow us to build a bridge to a low carbon world.

We have to make electricity affordable and clean. Anyone who sees the cost change in solar panels—from 2008 at $4 dollars per watt to today at 65 cents per watt—must believe in the power of technology to drive the costs down.

EP: Can industrialized nations learn from how rural Africa could electrify its villages?

JR: What Africa can perhaps teach us is an acceleration of the microgrid. We are talking about microgrids in the U.S. and we did two microgrids on our system at Duke Energy. The U.S. could learn from Africa how to go "Back to the Future." We would be going "Back to the Future" with microgrids, in a way. When the grid was beginning in the U.S. in the early 1900s, what we really had was a lot of microgrids. We had many little villages and towns and, as the 20th century progressed, we connected them all to create the grid we have today.

I think we will learn a lot from microgrids. Our confidence in solar and storage will only increase as we deploy in these remote areas of Africa and Asia and demonstrate to the world how it can work and be affordable. An emphasis on efficient appliances in those areas will also drive increasing demands for efficient appliances by US consumers. We will want more efficient TVs, refrigerators, refrigerators, etc.

The concept of mobile payments is another innovation that we are learning from Africa. That's where we are headed. To give an idea of the potential for mobile payments, look at Off-Grid Electric. Off-Grid can fulfill orders from its San Francisco office to a hut in a village in Tanzania. It can do this because of the way they are connected.

There are a number of drivers: You have microgrids, solar, storage advances, mobile payments, and more efficient appliances. From this technology, new configurations are

forming and new systems evolving. Those ingredients will create new business models in those rural areas that can be deployed in the U.S. and around the world.

EP: Will people and utilities in the high-income world be motivated to build microgrids?

JR: What will drive microgrids in the US is the increasing possibility of cyberattacks. The desire for greater system reliability and resiliency will also be motivators. What we have learned, however, is that it is a lot easier to take raw dirt and develop a microgrid than take an existing grid system and try to imbed a microgrid into that system.

A Vision to a Better Way

EP: What will the future utility look like?

JR: We're moving into a world with a mix of both distributed generation and central generation. There will also be microgrids. It's unclear what exactly the mix will be in any one region, but we are moving into a world in which energy demand is flat or declining because of increased efficiency in homes and businesses, and because the Internet of Things (IoT) and software will allow customers to reduce their energy use. Energy efficiency and time-of-use rates, coupled with demand response, will bring huge productivity gains to the system.

Also, It's hard to believe that behavioral changes alone will drive the change, because the price of electricity is so low as a percentage of disposable income. Ultimately it will be technology that drives it.

I think the headline will be, simply, "Every power plant in this country is going to be retired or replaced by the year 2050 with the exception of hydro." I don't believe the government will extend the lives of nuclear plants from 60 to 80, years for example. That's why I think having a price on carbon will be so critical. Because, if we're going to retire and replace these units, which represent 57 percent of U.S. carbon-free electricity today, let's do it in the context of a price on carbon. That way we can achieve both objectives.

I spent 25 years in the industry and it was pretty darned exciting, but the industry today is more exciting than in any of those 25 years.

EP: We don't often hear industry people pushing for this transformation. Why do you think that's so?

JR: A lot of people in the industry have forgotten where they came from. The power sector used to be a high-tech industry but it doesn't have that reputation now. It has to become the high tech industry of today.

We need to embrace and deploy new technologies, to embrace or develop new business models and new regulatory models. We have to believe that our ideas are better than anybody's idea, and to convince the world that they are. The industry needs that kind of mindset. It needs to get up and say, "We have better ideas." They should put a lot of energy into developing them.

Utilities are gun-shy. They figure, well, if we propose it we will get a lot of opposition. My answer is, "If you don't propose it who the hell will?"

There is a great West Texas rule: "Pioneers get the arrows and the settlers get the land." The utilities should be pioneers with an eye on the land. If they are smart and deploy the technologies, they will, ultimately, get the land.

To me this point is key. In any business, incumbents are by definition not aggressive. They respond and react. They don't attack. They should be attacking and not responding. They should be punching and not counterpunching. They should be selling.

EP: There are many layers to your book. It talks about the two-way learning that can occur between low-income and high-income countries. It talks about business models, about modernization, and how to scale up access to electricity for 1.2 million people. The book brings awareness and it also tells stories about communities and people.

JR: I tried not to be technical. I tried to remember to tell stories because people remember stories better. Tom Friedman has a way of telling stories and then drawing conclusions with some lights-out insights. People learn when they read stories and have an "aha moment" that they link back to the moment imbedded in the story. I tried to write a story-telling book. I also tried to be technically sound but not use technical language, which turned out to be harder to do than I imagined.

EP: Where do you go from here?

JR: When shopping "Lighting the World" I had a lot of publishers who would have preferred a book about the US power sector and where it is going. But that's not what I decided to write about. I believe that focusing on low-income countries—how we help bring them electricity they can use to scale-up their economies and their lives—is like going back to our own roots, our own journey

To me, the success of this book will be determined by how many people are inspired to take action and how many governments implement policies to accelerate access to electricity by the rural poor. ■