

MARCH 2017

PUBLIC UTILITIES FORTNIGHTLY

"In the Public Interest"

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Pedro Pizarro, Arshad Mansoor
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Kim Harriman, Jorge Cardenas
Tom Sloan, The Jetsons



At NARUC Winter Meetings

On Edison Foundation panel, ACC Chair
Tom Forese asks how many varieties of Cheerios
to illustrate customers' varied needs

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Cover photo: At the NARUC Winter Meetings, the Edison Foundation Institute for Electric Innovation breakfast panel, from left to right, Lisa Wood, Edison Foundation; Chair Tom Forese, Arizona Corporation Commission; Manal Yamout, Advanced Microgrid Solutions; Karen Lefkowitz, Pepco Holdings. As for Chair Forese's question, there are thirteen varieties of Cheerios. Photographer: PUF Staff.

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Leadership Lyceum Podcast Summary

Perpetuating the California Dream



Conversation with Edison International
CEO Pedro Pizarro

PEDRO PIZARRO, WITH TOM LINQUIST

Edison International is the publicly traded holding company for Southern California Edison, the regulated utility, and a small array of non-regulated investments, plus Edison Energy. At eleven and a half billion dollars in annual revenue, and serving fifteen million customers, the company is one of the largest utilities in the country.

Tom Linquist: Pedro, you're three and a half months into your tenure as CEO. What are the key areas of focus on your leadership agenda at this early stage?

Pedro Pizarro: Our team has really gelled in these first few months. In terms of strategy there are four big focus areas. Three are for our regulated utility and one is for our competitive businesses. Inside the regulated utility, SCE, there are three things that we're doing.

The first is to continue our reinvestment in our grid. That's the core business. It's aging and it also needs modernizing to support the new resources arriving in California.

The second is continuing to improve our operational performance. It starts with the safety of our employees and our public. It continues with how we do in terms of reliability and customer satisfaction and the costs that drive affordability.

The third big part of SCE's strategy is how we position the company to help our state of California achieve its very ambitious targets for reducing greenhouse gases. That's a big task: forty percent reduction from 1990 levels by 2030.

Even with the change in administration at the federal level, the state of California remains very committed to this. We have a role to play. That role is to help catalyze all the efforts to support reducing greenhouse gases.

Outside of our utility, the fourth strategic element is pursuing different avenues; not only for growth but also for playing a part in the drastic transformation that's taking place in our industry.

The largest effort we have right now is developing Edison Energy, which is offering a suite of services, really "energy-as-a-service" focused on large commercial and industrial customers across the country.

It is a segment that has complex energy needs but also tends to be one of the first adopters of new technologies as they come into the industry. That's another area we can explore, but I'd say those four from a strategy perspective have really been my main focus areas.

Tom Linquist: Tell us more about Edison Energy.

Pedro Pizarro: More recently at the end of 2015, we acquired three companies that formed the core for our Edison Energy suite of services focused on the commercial and industrial market, or what we call C&I.

We acquired Altenex. They're based in Boston and they have helped create the market connecting C&I customers with off-site renewables. They've processed more than a gigawatt worth of PPAs to date.

Tom Linquist: is a partner at a leading global executive search firm. He is an expert on executive assessment and leadership development, and can be reached at Linquist@LeadershipLyceum.com.

Edison will help California achieve its very ambitious targets for reducing greenhouse gases.

The second company we acquired was Delta Energy. They're based in Ohio and they do over five billion dollars a year in commodity procurement as the agent for our customers. So, they're not taking

that on our balance sheet, but they're assisting C&I customers with their own commodity procurement.

The third firm we purchased was Eneractive Solutions, based in New Jersey. They're really an engineering shop. They help C&I customers across a broad range of needs including building controls and efficiency projects and boiler work.

Tom Linquist: How do you see the prospects for Edison Energy?

Pedro Pizarro: We communicated to our investors at the end of last year that we are very encouraged by what we see in terms of the market opportunity. We already serve a dozen of the Fortune 50 and a number of the Fortune 500, but we have more work to do in terms of really pinning down the next level in our detailed business plan.

We have a strategy. We have a broad level plan, but as you get into the market, we launched a brand that really opened the doors for business around the spring of 2016.

We took these three companies: Altenex, Delta Energy, and Eneractive Solutions that were doing well in each of their individual spaces. For the first time we really brought them together to start building this tapestry of a combined energy as a service suite for the C&I customers. We've learned a lot in less than a year.

Tom Linquist: What are the learnings that come from those investments?

Pedro Pizarro: In terms of Edison Energy itself, it's being in the market and actually testing the concept with clients and seeing what makes sense for them. Just giving us the new data that we are using to refine our business plan.

I've shared with our investors that we expect to be providing more detail over the course of 2017. Certainly, by the fall of 2017, if not earlier, we'll provide more details in terms of the metrics and milestones that we want to measure ourselves by.

We can then give them a greater degree of comfort around our confidence in the business, but also tell them what the measures of success are that they can hold us accountable for.

Tom Linquist: How about the learnings you can apply more to the entire company?

Pedro Pizarro: In California we have affiliate restrictions that are probably more restrictive than those in most states. There are some pretty stiff walls between what we can do on the regulated utility side, versus what we can do on the competitive side.

That said, one of the value propositions from a total EIX standpoint of having a dual platform is that the utility gives us one lens into how the industry is changing. How are utility customers adopting new technologies? How is that influencing their use of the grid? What changes does that drive in how the grid is configured? It's one lens.

It's a very different lens that we now get by serving customers at Edison Energy and at SoCore Energy. SoCore Energy is a wholly owned affiliate of Edison and a national solar developer focused on the C&I segment. We are seeing how those C&I customers are adopting these new technologies, and how they're interacting with their local regulated utilities.

I think we'll be smarter about where the industry is headed and have a more sensitive radar screen that allows us a view into how real customers are changing their real relationship with energy out there. By having one eye, one vision or view through a regulated lens and a very different view through a competitive lens.

Tom Linquist: Can you give an example of something that may be providing fresh eyes on something that's appealing to customers or serving customers differently?

Pedro Pizarro: One example is use of storage. I'm really proud of what SCE has been doing for years now to try and get our collective heads around what's the potential for storage?

How might the different kinds of technology fit into a grid like ours? What are the different use cases?

For example, when Southern California Gas had its issues with the Aliso Canyon storage field last year, the California PUC asked utilities to run solicitations to see if additional storage could be brought online quickly. That would be electric storage to help compensate for the loss of gas storage.

That brought out some very different use cases and frankly a lot of creativity on the part of both third parties in the market and our utility team.

That's one way we learned about different ways to use storage. Here are a few examples. We now have added batteries at a couple of our utility owned peaking stations. I think it's the first time that you've seen that integration of storage down at the peak level, so it's a very different use case.

At the same time, SCE has been running broader solicitations for storage, and a lot of that has led to battery contracts. There are a few non-battery applications as well, but lots of batteries. Behind the meter, in front of the meter, it's been really interesting to see all those use cases living together in the same grid.

Now, let's get to your point. I think economics is certainly a driver for those competitive clients we've seen. But we're seeing applications on the competitive side, even though storage is still relatively expensive.

If a commercial or industrial customer can offset a relatively high demand charge from its local utility by shaving a good chunk off its peak using storage, that ends up being a compelling economic value proposition for some of these customers. And we're providing the service.

Again, observing all the rules, but at a broad strategy level to have those perspectives of deployment of these technologies across both regulated and competitive landscapes is fascinating.

I'm really proud of what SCE has been doing around the potential for storage.

It gives us a much better platform from which to think about where else the industry might be headed.

Tom Linquist: What are you seeing in other states in that regard?

Pedro Pizarro: It's state-by-state. That's the obvious one, right? We do live in a country that, while we have some broad national energy policy, the reality is that a lot of the action in the U.S. happens down at a state level, PUC by PUC.

There are probably some common themes across all those states. Again, I think most utilities have demand charges that they apply to commercial and industrial customers.

I think you see a common approach, particularly across the larger C&I customers who are in multiple states. There's a playbook there around what tools might help them to reduce our exposure to typical rate economics. On the other hand, individual states will have different programs or different incentives that create different opportunities.

As one example, last year, through SoCore Energy we purchased a portfolio of community solar projects in Minnesota. It turns out that a lot of states have expressed interest in developing community solar gardens. The rules are different in all the states.

Minnesota's framework has been one that's been fairly attractive and constructive in terms of truly incentivizing the development of community solar gardens. It's probably one of the most attractive states in that sense.

You see a real difference in that there's a lot more community solar garden development there than you see even in a state like California. California clearly is at the forefront of solar development and providing support for solar. Community solar is not quite as advanced in California yet. I think the framework is still evolving and so you see a big difference compared to a state like Minnesota.

Tom Linquist: Let's turn to you more personally. California recently lost a great icon. The great

California chronicler and historian, Kevin Starr, passed away at 76 years old last Saturday. Governor Brown said of Mr. Starr that he "Captured the spirit of our state and brought to life the characters and personalities that made the California story. His vision, like California itself, was bigger than life."

Pedro, as CEO of an iconic cornerstone California company, in my view, you're now one of the characters and personalities that make up the California story. Does that bring any unique sense of responsibility?

Pedro Pizarro: Thank you for the comments, but I think you're talking about some larger than life folks. That said, I do think we are an iconic company. We have been a big part of the growth of the southern part of our state.

As the company went, and as the economy went, those two went together. Bringing power initially from hydro resources that were deep into the mountains hundreds of miles away. The development of some of the first high-voltage transmission lines in the country was based on research done by the California Institute of Technology in tandem with SCE, by the way.

That rich history, the post-World War II boom years. The growth of the population and housing in tandem with the growth of our grid is a great part of the southern California story.

There's responsibility that our company feels, and our leadership feels, and I feel. Not only to lead the company, but to play our role in helping lead the California economy. I think that leadership then extends beyond California through our competitive activities as well.

Tom Linquist: I see you're on the board of LA 2024 for LA's bid for the Olympics.

Pedro Pizarro: Yeah, I'm really excited about that. I just became involved with that when I took on the CEO role. It's a group that's sponsoring the efforts to put together what I think will be a great bid to bring the 2024 Olympics to LA. There is a strong sense of conviction that the Olympics will be net financially positive for the community. That's a big deal.



The last time LA hosted the Olympics was back in 1984. I actually learned recently that led to the creation of almost a one hundred-million-dollar trust for Southern California that was left over after all the bills were paid.

It actually created economic value. To this day, it is still sponsoring programs in the community and helping disadvantaged youth. There's a real potential to add significantly to that with the 2024 Olympics.

Anyway, as the International Olympic Committee looks at the bid and

they see a community that brings great support for the Olympics and brings a great financial proposition to it, that should make for a pretty compelling bid. We have our fingers crossed here.

Tom Linquist: That's exciting. I want to turn back to California's leadership and to SB 350 and SB 32. California is leading the way in terms of greenhouse gas reductions.

Pedro Pizarro: There's a role we must play to help the state grapple with meeting the objectives of SB 32, the law that codified the forty percent reduction target for greenhouse gases from 1990 levels by 2030.

That is a big lift for this state. We have a direct role to play in terms of our grid. As I mentioned earlier, we also have a catalyst role that we have to play to help bring together all the different forces in society that are going to have to coalesce to make this thing actually happen.

I will not say that everything California is doing is being done perfectly. I think, as any one of these things have been debated, frankly, the company and I have had concerns about specific elements.

But, the overall trend is one where, in particular in the last several years, the conversation has changed. It got a sharper accent on coalescing on the theme of human influence in climate

change, and the role of greenhouse gas reduction in helping to mitigate that.

If you go back thirty years, to several of the first renewable programs, and the focus on energy efficiency, the state has done a remarkable job. At times it's been expensive. There's been a risk in that.

There still is a risk in that, because you're always optimizing, balancing the big macro-objectives with the micro-level realities. You can do something that might be the right thing for the environment in terms of a target or a mandate but it does have a cost consequence to it.

If it pushes businesses out of their states, that's not good for the population at this moment in time. There are impacts from that, so you always have to be thoughtful about managing that balance.

Tom Linquist: How do you, as a company, engage in this area?

Pedro Pizarro: One example in terms of how we engage is SB 350. You mentioned that. It's the bill that was passed two years ago now to, among other things, increase the state's renewable portfolio standard requirement to fifty percent by 2030.

Our company ended up supporting that and supporting it pretty actively, but only towards the end of the process. And only after we had sought and obtained a number of really important changes to the bill that help protect our customer's economic interests.

I'll give one example of this. Prior to SB 350, the utilities were the entities in the state that had to fulfill some significant part of their renewable requirements through long-term contracts. We do have some limited retail competition in the state.

Those competitive retail entities did not have the same sort of long-term procurement requirement. They were able to use short-term resources in the market. Because of all the long-term development, you could always find transactions in the market for short-term resources which were, quite frankly, a lot cheaper than the long-term contracts.

That created a real risk for our customers getting left holding a much more expensive bag, and carrying more than their share of the development costs for new resources to feed the state over the long run.

SB 350 included modifications that helped to bridge that gap. That brought in long-term requirements for everybody and also allowed investor-owned utilities to access a greater portion of their requirement using short-term markets. We're always in that balancing act. I think we support the progressive policies, but we want to do it responsibly.

Another example where we have not been successful to date is the Net Energy Metering story. You might recall that the state launched net energy metering a few years back. Last year there was a proceeding to work on NEM 2.0, the second iteration of NEM.

Without going into all the details, our basic company position was that we really support solar, we think it's an important

resource and we think that distributed solar and private solar makes a lot of sense.

We believe that given the environmental benefits it brings, it should have some level of subsidy support. But we thought that the current mechanism had an excessive level of subsidy that created a real disadvantage for our customers who don't have private solar on their rooftops. They were bearing too much of that cost.

We did not prevail at that proceeding. We did get a commitment from our Public Utilities Commission to revisit the topic in 2019. I think what the PUC said was that there wasn't enough data in the market yet about the relative benefits of solar, and they wanted a little more time to pass by to make the argument.

It's a debate that will come back to the state. We think it's an important one because we want to do everything we can to incentivize the use of the resources. In fact, on the utility side, we've worked really hard, Tom, to do things like significantly, dramatically cut down the time that we need to evaluate and approve customer requests for interconnection of solar into our system.

It used to take us over thirty days to go from a completed application to an okay to proceed. That's down to a little over a day now.

California clearly is at the forefront of solar development and support for solar.

want to make sure that the economic burden is shared more evenly across society.

The reality is today we have too many of our non-solar customers, including our lower-income customers, who are paying too high a share of that. Part of our finance story has been how do you strike a balance. We, as utilities, have had an important role to play in helping to educate and to moderate the outcomes.

Tom Linquist: How do you see the company's role with respect to SB 32?

Pedro Pizarro: We now have SB 32. Again, a forty percent reduction from 1990 levels by 2030 across the entire economy. A little bit of context is helpful in describing just how big a task that is.

I think I shared this with our investors in my last earnings call. Between 1990 and 2014 the state's population grew by thirty percent, so the economy grew along with it. Greenhouse gas emissions statewide went up by only three percent.

That's remarkable. That's a big, big success story for the state. That's the impact of the early days of renewables. That's the impact of the focus on energy efficiency. That's kept, per capita, energy consumption flat to declining. That's a big success in

terms of the focus on passenger vehicle fuel efficiency. It was a big win for the state.

That was until 2014. Now we're here in 2017 sitting with that slight increase over time. That means that forty percent reduction is actually more like a forty-two percent reduction from current levels that we now need to achieve thirteen years from now.

I'm assuming that the economy will continue to grow and the population will continue to grow. That's a big task. It was a huge accomplishment to keep greenhouse gases flat over two and a half decades. It's going to be a much bigger challenge to have them decrease by almost half.

When you take a look at the stack of greenhouse gas emissions for the state, in part because there's been so much focus on the electric segment of the economy, electric power generation only accounts for about twenty percent of California greenhouse gas emissions.

This is 2014 data. In contrast, transportation is thirty-six percent of statewide greenhouse gas emissions. Industrial manufacturing processes are another twenty-one percent.

Even if you could magically wave away all remaining greenhouse gas emissions from the electric sector, it would be tough to do because we still need at least some portion of gas-fired resources to serve as a balancing tool. But even if you did away with all electric power emissions, that would only be a twenty percent reduction of greenhouse gases for the state, without accounting for continued population growth.

That means, by definition, that a significant portion of the changes over the next thirteen years are going to have to come from other sectors in addition to the electric power sector. Economy-wide, any place we're putting a fossil fuel in a combustion chamber and lighting the match, is going to be a candidate ripe for conversion to an alternate technology.

Over the course of the next thirteen years, most of those conversions are going to rely on electric sources and will use the grid. That's the task ahead. Our role in that is really twofold, as I said in the beginning of our discussion.

We need to make sure that our grid can handle what's coming. We need to make sure that our grid can handle it while meeting the state's objective of fifty percent renewables under SB 350. We also need to acknowledge that a lot of the future sources of energy won't all be central power stations. They'll be a lot more distributed resources as customers make choices to deploy their own technologies.

So, it's a big task for us. I feel very confident about our ability to manage that. We filed a rate case recently covering 2018 to 2020. The rate case continues our reinvestment in the grid.

It also has amounts in there for modernizing the grid and making it better able to manage distributed energy resources growing on our system. But as I said earlier, the other challenge we have is how do we help the rest of society, the rest of the

economy, grapple with that conversion that we're going to make? Then there'll be a number of projects that are going to require cross economy collaboration.

Tom Linquist: What do you see as the ideal areas for cross industry collaboration?

Pedro Pizarro: One obvious example: we have two major ports in Southern California. One of them is in our service territory, the Port of Long Beach. The other is adjacent, the Port of LA.

The Port of Long Beach has been a real leader in demonstrating electrification technologies. They have a relatively new terminal that's all electric. Within the fence of the port there are automated, driverless vehicles that are battery-operated.

So, that's great from a greenhouse gas emissions perspective, great from an efficiency perspective as well, and for labor efficiency. But when you think about those ports, it's not just the operations of the ports, it's the whole transportation net-

work that comes out of those ports. Say within a fifty-mile radius, it's multi-modal transport.

Some of it is rail. Some of it is truck. A lot of it goes to warehouses at the outskirts of the metropolitan area. There

is a lot of fossil fuel use and resulting emissions out of that whole system.

A lot of it travels over the I-710 Freeway. That's one of the older freeways and it tends to be pretty busy with traffic with a lot of trucks on it, because all those trucks are either coming or going to the ports.

Imagine a world where sometime in the next thirteen years, we, and I mean we California, not just we at SCE, that we repurpose some of those lanes and we also have transmission rights-of-way along parts of that. It's going to take a lot of folks to do this.

Imagine taking all of those rights-of-way, all that land, and reconfiguring the modes of transportation that use it. Having electric forms of transportation, whether it be electric trucks or whether it be conveyance systems, or what have you.

It would yield significant impact in terms of reducing greenhouse gases, but also significant impact in reducing all the other criteria pollutants along the way. That I-710 route goes through a number of disadvantaged communities. So, you have an immediate set of health benefits, beneficial impact for those communities in addition to helping meet the broader objectives of greenhouse gas reduction.

That's one example, but can you imagine the kind of cross economy and cross government collaborations required? We need to be a part of it. There are various transit companies,

(Cont. on page 72)

Perpetuating the California Dream

(Cont. from p. 33)

whether rail, trucking companies, Caltrans (the California Department of Transportation), local authorities, the Air Resources Board, or the Public Utilities Commission. It's going to take a really big village to get these things going and we have thirteen years to do it.

Tom Linquist: That's not much time. It's a big job. I'll ask an idealistic question, or maybe it's a question seeking an idealistic answer. How do you envision a way of cooperating with these other sectors, whether it be transportation, industry, ports?

Pedro Pizarro: I want our company to be seen as a thought leader and be willing to engage and have the debate but also to have a sense of urgency because the state needs it. We have the legislative foundation. We have SB 32.

It's very clear. It's a law that was really firmly supported by the population of the state. There is very deep support for this across the electorate. Folks have to come together and recognize that no one entity alone can solve this problem.

As Edison International we have the responsibility to, first of all, educate ourselves and have a point of view on what we think may be needed, recognizing we won't get it all right. But we want to have a starting point of a good analytically-based point of view on the kinds of initiatives that will be needed across the economy.

I want us engaging with multiple parties out there. We need to have the point of view out there in a very transparent way. Then frankly, we've just got to roll up our sleeves with folks who'd be natural partners and then with folks who may not be natural partners.

Just as we're having to change how we operate as a utility in some pretty dramatic ways, I think there'll be significant changes coming to a number of other industries. If the state is serious about meeting its objectives by 2030, there's no one initiative, no one big program that's going to get you forty percent of reduction.

It really has to be a multitude of programs economy-wide. Even in the case of transportation electrification, as you do the whole rack and stack of emissions, they don't all come from one kind of vehicle, or one kind of use. It's just really spread out across the economy. It's a big job.

Tom Linquist: Let's wrap up on a hopeful LA 2024 Olympic note. There's an interesting tie-in. The claim was made on the LA 2024 website that it's going to be the first "energy-positive,

solar-powered games" ever. Does that tie in somehow to our whole conversation?

Pedro Pizarro: Oh, it absolutely does, both to SCE and to Edison Energy. We're engaged at Edison International with the organizers. What a great opportunity to highlight the new technologies that are reshaping the energy industry, and to actually put them to work.

The objective here is to have the cleanest Olympics in history by widespread use of technologies like solar and storage and the electric vehicles. Also, this will be a very efficient Olympics.

We'll be bringing all of this to bear to support the Olympics, coincident with where California will be on SB 32 by that point.

We need to make sure that our grid can handle what's coming.

2024 is actually a little bit more than halfway between today and 2030, the date by which we will have reduced our greenhouse gas emissions by forty percent.

We better be well on the way to significantly changing what the economy looks like and what the greenhouse gas intensity of the economy looks like. I am convinced. I don't see any way the state can get there unless many parts of the economy adopt the electric technologies, shift from using fossil fuels to using the grid as a power source.

In that context, I would expect this Olympics to have significant use of solar resources, significant use of efficient lighting, significant support from a modernized grid that can accommodate more of these distributed resources.

Electric transportation is going to be a big part of it. Then you think about the mass transit requirements to move, not only Olympic competitors, but also the viewing public around the city. That will require a significant infrastructure investment, significant changes and retooling across multiple sectors of the economy.

We at Edison International are committed to being a key partner not only in the Olympic effort but in the overall climate change and greenhouse gas reduction effort.

Because of our large footprint in Southern California and our history of innovation, we are well positioned to help lead the transformation of our economy. The great people at Edison International are ready to do great things. **PUF**

To hear the full interview, please link to the podcast at Leadership Lyceum: A CEO's Virtual Mentor, available at Apple iTunes. Search iTunes Podcasts, with the keyword Leadership Lyceum.

Housing starts of single-family houses were up 6.2 percent in January 2017, as compared with the prior January. Electricity sales growth is driven in part by these housing starts, since these homes generally have large interior volume and 56 percent of them are located in the higher-usage south.