Webinar

Get Smart

Date: July 31, 2023

00:00:05 --> 00:00:16: All right.

00:00:16 --> 00:00:18: Welcome everyone to the webinar.

00:00:19 --> 00:00:21: If you wouldn't mind sharing the chat a little bit

00:00:21 --> 00:00:23: about yourself before you begin, that would be lovely.

00:01:07 --> 00:01:08: I welcome.

00:01:08 --> 00:01:10: We'll begin in just a moment, but in the meantime,

00:01:10 --> 00:01:12: please help us get to know you better by sharing

00:01:12 --> 00:01:14: the chat, the industry sector you work in, as well

00:01:14 --> 00:01:16: as what you'd like to learn from this webinar.

00:01:58 --> 00:02:00: All right, we'll be getting started in just a few

00:02:00 --> 00:02:01: seconds.

00:02:01 --> 00:02:03: But in the meantime, if you could please share your

00:02:03 --> 00:02:06: industry sector in the chat, as well as anything you'd

00:02:06 --> 00:02:09: like to learn from this webinar, please do so.

00:02:52 --> 00:02:57: All right, let's get started.

00:02:57 --> 00:03:00: So good afternoon, everyone, and welcome to the Get Smart

00:03:00 --> 00:03:04: the Business Case for Grid Interactive High Performance Buildings webinar.

00:03:05 --> 00:03:07: My name is Leon Plass, and I'm a senior manager

00:03:07 --> 00:03:09: with the Urban Land Institute's Resilience Program.

00:03:10 --> 00:03:14: I'm joined on this call here with panelists Jonathan Flaherty,

00:03:14 --> 00:03:19: Managing Director and Global Head of Sustainability and Building Technologies

00:03:19 --> 00:03:23: at Tishman Spire, Jake Elder, Vice President of Research and

00:03:23 --> 00:03:27: Innovation and at Energy Impact Partners, Sarah King, Senior Vice

00:03:27 --> 00:03:31: President of Sustainability at Kilroy Realty and Anish Chiluk, Manager

00:03:31 --> 00:03:35: of Carbon Free Buildings at the Rocky Mountain Institute.

00:03:36 --> 00:03:38: So we have a packed agenda to cover over the
00:03:38 --> 00:03:42: span of this brief hour, beginning with some background information
00:03:42 --> 00:03:45: on the subject of grid interactivity and energy efficiency, and
00:03:45 --> 00:03:49: then flowing into a more indepth discussion with our panelists.
00:03:50 --> 00:03:54: We're living right now in a time of unprecedented change,
00:03:54 --> 00:03:57: and as a result of climate change, we're facing new
00:03:57 --> 00:03:58: uncertainties.
00:03:59 --> 00:04:01: But the final outlook is going to depend on our
00:04:01 --> 00:04:03: ability to both curb our emissions and adapt to new
00:04:03 --> 00:04:04: conditions.
00:04:05 --> 00:04:08: A recent report by the World Green Buildings Council found
00:04:08 --> 00:04:11: that buildings account for 39% of global emissions, which is
00:04:11 --> 00:04:12: a staggering figure.
00:04:12 --> 00:04:14: That begs the question of what can be done to
00:04:14 --> 00:04:17: meet the Net 0 emissions paradigm for buildings, or rather
00:04:17 --> 00:04:18: the Net 0 imperative.
00:04:20 --> 00:04:24: Constructing and retrofitting grid interactive high performance buildings is one
00:04:24 --> 00:04:26: of the many pathways towards reaching that zero goals.
00:04:27 --> 00:04:31: These are structures that optimize energy efficiency by integrating renewable
00:04:31 --> 00:04:34: energy sources and energy efficient technologies and can both consume
00:04:34 --> 00:04:37: from and provide power back to the electric grid while
00:04:37 --> 00:04:40: offering additional benefits to owners and occupants.
00:04:40 --> 00:04:43: I'm here today alongside our amazing panelists to introduce you
00:04:43 --> 00:04:46: to some of the great potential for good interactive high
00:04:46 --> 00:04:47: performance buildings.
00:04:51 --> 00:04:53: There are many facets to the value proposition behind good
00:04:54 --> 00:04:55: interactive high performance buildings.
00:04:55 --> 00:04:59: And in the report, our forthcoming report this fall, we
00:04:59 --> 00:05:04: highlight carbon emissions reductions, utility bill cost reductions, build business
00:05:04 --> 00:05:09: continuity, asset resilience and improved occupant comfort as core components
00:05:09 --> 00:05:11: of that value proposition.
00:05:11 --> 00:05:15: Shifting away from carbon intensive sources of energy by installing
00:05:15 --> 00:05:19: onsite renewables and optimizing time of use electricity based on
00:05:19 --> 00:05:23: cleanliness of the grid can help mitigate emissions both

across

00:05:23 --> 00:05:25: asset portfolios and electric grids.

00:05:25 --> 00:05:29: These both go directly towards attaining the net 0 imperative

00:05:29 --> 00:05:32: as well as attaining and maintaining compliance with internal ESG

00:05:32 --> 00:05:35: commitments as well as regulatory requirements.

00:05:38 --> 00:05:41: Some of the common interventions behind good interactivity and energy

00:05:41 --> 00:05:45: efficiency includes smart building systems and time tested practices such

00:05:45 --> 00:05:46: as demand response.

00:05:46 --> 00:05:51: These interventions also contribute to utility bill cost reductions, since

00:05:51 --> 00:05:55: overall energy use and peak demand changes charges rather are

00:05:55 --> 00:05:59: minimized, which is even more appealing in light of accompanying

00:05:59 --> 00:06:03: decreases in operating expenses, which feed into higher net operating

00:06:03 --> 00:06:06: income and asset value when structures are taken offline or

00:06:07 --> 00:06:09: disconnected due to extreme weather conditions.

00:06:10 --> 00:06:13: These smart grid technologies and onsite renewables can also help

00:06:13 --> 00:06:17: ensure the commercial tenants are able to resume business operations

00:06:17 --> 00:06:20: in a timely fashion, and also gives residential property owners

00:06:20 --> 00:06:21: Peace of Mind.

00:06:21 --> 00:06:25: Given projected changes in the frequency and intensity of storms

00:06:25 --> 00:06:28: across the globe in the coming years, asset resilience against

00:06:28 --> 00:06:30: climate impacts will become increasingly important.

00:06:33 --> 00:06:36: In the past, there was also a perception that buildings

00:06:36 --> 00:06:39: could be either be energy efficient or comfortable, but to

00:06:39 --> 00:06:43: optimize for one or the other would require significant tradeoffs.

00:06:43 --> 00:06:47: With the introduction of smarter zonal controls and occupant feedback,

00:06:47 --> 00:06:49: things have changed significantly.

00:06:50 --> 00:06:54: And finally, these structures are built to last as new

00:06:54 --> 00:06:59: regulations are adopted to curb an emissions Preemptively mitigating, excuse

00:06:59 --> 00:07:04: me, curb emissions preemptively mitigating future financial risks to assets

00:07:04 --> 00:07:06: is increasingly important.

00:07:07 --> 00:07:11: So having addressed the why that value proposition, we should

00:07:11 --> 00:07:14: also be considering the how so Mary Ann Pied with

00:07:14 --> 00:07:19: the Lawrence Berkeley National Laboratory offered a few easy to

00:07:19 --> 00:07:23: remember points of guidance that was it's expanded on in

00:07:23 --> 00:07:25: greater detail in the report.

00:07:25 --> 00:07:29: So those points of guidance are shape systems to respond

00:07:29 --> 00:07:33: to tariffs to shape electric loads, shift to the cleanest

00:07:33 --> 00:07:37: available sources of electricity and move consumption to the cleanest

00:07:38 --> 00:07:38: time of day.

00:07:39 --> 00:07:44: Shed load through traditional demand response and finally shimmy with

00:07:44 --> 00:07:48: fast acting ancillary services like battery storage.

00:07:48 --> 00:07:51: So now that we've covered a bit of background on

00:07:51 --> 00:07:55: the business case for grid interactivity and and energy efficiency

00:07:55 --> 00:07:59: alongside some of the key concepts that we were addressing

00:07:59 --> 00:08:02: in this forthcoming report, I think it's time for us

00:08:02 --> 00:08:04: to begin our panel discussion.

00:08:05 --> 00:08:10: So I'm going to go ahead and turn off the

00:08:10 --> 00:08:16: screen share here and beginning with with Anish, I'd like

00:08:16 --> 00:08:22: to ask what new technologies are you excited for that

00:08:22 --> 00:08:28: are currently on the market to further enable next generation

00:08:28 --> 00:08:30: grid interactivity?

00:08:33 --> 00:08:34: Thanks, Leanne.

00:08:35 --> 00:08:35: Yeah.

00:08:35 --> 00:08:37: I think that there is a number of of new

00:08:37 --> 00:08:41: and emerging technologies that I'm particularly excited about.

00:08:42 --> 00:08:43: And I'll talk about a few of them.

00:08:43 --> 00:08:47: One is people have been talking for many years about

00:08:47 --> 00:08:51: a vehicle to grid interactivity, so using and harnessing the

00:08:51 --> 00:08:54: batteries that are in electric vehicles.

00:08:54 --> 00:08:56: And for many years the US just didn't have consumer

00:08:56 --> 00:08:59: products that were available and we're finally starting to see

00:08:59 --> 00:09:00: that change.

00:09:01 --> 00:09:05: So you know Ford is piloting the F-150 Lightning which

00:09:05 --> 00:09:09: has that capability and a number of new large.

00:09:11 --> 00:09:14: EVEV's that are coming into the market will also have

00:09:14 --> 00:09:15: that capability.

00:09:15 --> 00:09:19: And you also see a number of utilities piloting vehicle

00:09:19 --> 00:09:24: to grid interactivity with assets they control things like school
00:09:24 --> 00:09:28: buses, municipal fleets for buses and things like that.
00:09:28 --> 00:09:30: So we're going to see vehicle to grid really growing.
00:09:32 --> 00:09:36: For a built and you know, specifically to building systems,
00:09:36 --> 00:09:39: I think that there's a lot of new software tools
00:09:39 --> 00:09:43: online that are making it easier to aggregate loads.
00:09:43 --> 00:09:47: So when we talk about good interactivity, people are thinking
00:09:47 --> 00:09:51: about individual technologies, but tying them all together and aggregating
00:09:51 --> 00:09:54: them so that they can be one kind of larger
00:09:54 --> 00:09:57: load and basically more useful to a utility company.
00:09:57 --> 00:09:59: There's software tools that are enabling that.
00:09:59 --> 00:10:00: There's examples.
00:10:00 --> 00:10:06: Of multifamily building owners aggregating domestic hot water tanks, which
00:10:06 --> 00:10:10: are small in each unit but in aggregate across the
00:10:10 --> 00:10:15: whole building through the software, they're aggregated and can actually
00:10:15 --> 00:10:18: provide a useful asset to the utilities.
00:10:18 --> 00:10:21: So those are two examples that I'm particularly excited about.
00:10:22 --> 00:10:22: Thank you.
00:10:23 --> 00:10:27: Jake, did you want to provide any thoughts on this?
00:10:27 --> 00:10:29: What new technologies are you excited for?
00:10:29 --> 00:10:30: Yeah, happy to.
00:10:30 --> 00:10:32: And I agree with what Anish said in terms of
00:10:32 --> 00:10:34: some of the areas where innovation is happening.
00:10:35 --> 00:10:36: To me though, I think a lot of technologies are
00:10:37 --> 00:10:38: already there and it's really about deployment.
00:10:39 --> 00:10:42: So we're looking for tools that can help actually move
00:10:42 --> 00:10:43: to deployment.
00:10:43 --> 00:10:46: Perhaps there's some software applications to find the right deployments
00:10:46 --> 00:10:48: and the right buildings with the right business models.
00:10:48 --> 00:10:50: And then equally important from my perspective is how do
00:10:50 --> 00:10:52: we get the utility side of the equation to get
00:10:52 --> 00:10:55: the incentives right to make this really a partnership and
00:10:55 --> 00:10:57: help both both building operators and then the utility industry,
00:10:57 --> 00:10:59: you know saw some of these challenges together.
00:10:59 --> 00:11:01: I think the one note that I'd make that that
00:11:01 --> 00:11:03: to me has held some of this back is, is
00:11:03 --> 00:11:05: really that you know historically great flexibility.
00:11:05 --> 00:11:07: These programs have existed for a while.

00:11:07 --> 00:11:10: They've been low automation, you know, utility operators just picking

00:11:10 --> 00:11:13: up the phone and calling folks and lots of companies

00:11:13 --> 00:11:15: trying to add more automation to that.

00:11:15 --> 00:11:17: But I think I'd be curious to hear from Jonathan

00:11:17 --> 00:11:20: and Sarah what the value proposition really is for a

00:11:20 --> 00:11:20: building owner.

00:11:21 --> 00:11:23: Historically, they just kind of haven't really been into energy

00:11:23 --> 00:11:24: systems.

00:11:25 --> 00:11:27: And I think one of the reasons I would hypothesize

00:11:27 --> 00:11:29: is that productivity is way more important than energy.

00:11:30 --> 00:11:33: And so if you take a typical large office building,

00:11:33 --> 00:11:37: the average annual value per energy savings from automation might

00:11:37 --> 00:11:38: be like $0.50 a square foot.

00:11:39 --> 00:11:41: But if you increase labor productivity by 1%, that's like

00:11:41 --> 00:11:43: 10 bucks a square foot in terms of savings.

00:11:43 --> 00:11:45: And so that tension is real.

00:11:45 --> 00:11:46: And and yeah, Jonathan.

00:11:46 --> 00:11:49: Said, well, I would just say like you know to

00:11:49 --> 00:11:52: give a good example where we collect the most demand

00:11:52 --> 00:11:55: response revenue today, demand response being a crude version of

00:11:55 --> 00:11:58: grid interactivity, the only one we really get paid for

00:11:58 --> 00:11:59: today.

00:11:59 --> 00:12:01: But, so we'll use it as the example, but I

00:12:01 --> 00:12:04: wouldn't call it grid interactivity and I think the way

00:12:04 --> 00:12:07: that we're discussing, right, but like you know we make

00:12:07 --> 00:12:07: a couple.

00:12:08 --> 00:12:11: Well, I'm not going to make a decent amount of

00:12:11 --> 00:12:14: money doing that at Rock Center, but it's far less

00:12:14 --> 00:12:16: than .5% of the revenue center, right.

00:12:16 --> 00:12:19: And so at the end of the day, making sure

00:12:19 --> 00:12:23: that every office is the temperature that the lease calls

00:12:23 --> 00:12:27: for and everybody is getting the services that they need

00:12:27 --> 00:12:30: is 99% of the goal, 1% is to do Dr.

00:12:30 --> 00:12:30: and energy savings.

00:12:30 --> 00:12:33: That's not because those numbers are good.

00:12:33 --> 00:12:34: We make good money off Dr.

00:12:34 --> 00:12:35: and love doing it.

00:12:36 --> 00:12:38: But at the end of the day, we make 99.5%

00:12:38 --> 00:12:42: of our revenue, making our tenants happy and comfortable in

00:12:42 --> 00:12:43: their offices.

00:12:43 --> 00:12:46: So there's a tension all the time there as to
00:12:46 --> 00:12:50: achieving both of those goals at the same time.
00:12:50 --> 00:12:52: But the sad reality is we're going to lean into
00:12:52 --> 00:12:55: comfort every day because that's where the real revenue is.
00:12:56 --> 00:12:58: But sorry Sarah, I'm sure you didn't need to jump
00:12:58 --> 00:12:59: in there for you.
00:13:00 --> 00:13:03: No, I I agree with everything that's been said and
00:13:03 --> 00:13:05: I think you know like with a lot of things
00:13:05 --> 00:13:09: sustainability related, you know the tech and the tools exist
00:13:09 --> 00:13:11: and it's just a deployment problem.
00:13:11 --> 00:13:13: I think this is also kind of a we need
00:13:13 --> 00:13:16: to fight the the way we've always done things I
00:13:16 --> 00:13:18: think is is a very strong factor in real estate
00:13:18 --> 00:13:22: and especially in building operations and with engineering teams.
00:13:22 --> 00:13:24: And so I think that there's this, there's a lot
00:13:24 --> 00:13:25: of.
00:13:25 --> 00:13:28: I think demand response has kind of a bad, bad
00:13:28 --> 00:13:28: reputation.
00:13:29 --> 00:13:31: And so I think that as we talk about grid
00:13:31 --> 00:13:35: interactivity, I think we need to figure out it's kind
00:13:35 --> 00:13:38: of like a people behavior change problem to challenge some
00:13:38 --> 00:13:39: of the.
00:13:39 --> 00:13:42: The people who've been operating buildings for a long time
00:13:42 --> 00:13:44: in the same way that there's, there might be ways
00:13:44 --> 00:13:45: to to do it a little bit differently.
00:13:45 --> 00:13:48: That doesn't impact that tenant comfort, which I believe is
00:13:48 --> 00:13:52: absolutely, you know, foremost in everybody's mind from the engineering
00:13:52 --> 00:13:55: teams to the asset management to the property management teams.
00:13:56 --> 00:13:59: And just to briefly touch on something that Jake said,
00:13:59 --> 00:14:01: like we don't do automated demand response like you would
00:14:01 --> 00:14:03: think that that would be obvious, but no because.
00:14:04 --> 00:14:06: Who knows what the utility wants, right?
00:14:06 --> 00:14:07: Meaning, I'm happy to hear about it and we have
00:14:07 --> 00:14:09: an agreement to do those some of those things and
00:14:09 --> 00:14:10: get paid to do it.
00:14:10 --> 00:14:12: But there may be moments where we don't want to
00:14:12 --> 00:14:14: do that right for any number of reasons.
00:14:14 --> 00:14:17: And so automated demand response may be in the future
00:14:17 --> 00:14:20: it could be truly be invisible to the tenants.
00:14:20 --> 00:14:23: But we want to keep that level of control in

00:14:23 --> 00:14:26: our hands, not in content chance, I think.
00:14:26 --> 00:14:30: I think that Anish and Jake might have some opinions
00:14:30 --> 00:14:34: to share on specifically the relationship between the grid, the
00:14:34 --> 00:14:38: grid into the the the utility providers and the the,
00:14:38 --> 00:14:40: the building owners and operators.
00:14:41 --> 00:14:44: But I wanted to just pause for a moment and
00:14:44 --> 00:14:45: go back.
00:14:45 --> 00:14:49: We zoomed weigh in on these technology solutions specifically just
00:14:49 --> 00:14:50: to get people excited.
00:14:50 --> 00:14:53: But let's think about also the, you know at a
00:14:53 --> 00:14:56: higher level like what are the just general code benefits
00:14:56 --> 00:15:00: that you're seeing with these sort of grid interactivity solutions.
00:15:01 --> 00:15:05: Let's you know we mentioned like demand response quite a
00:15:05 --> 00:15:08: few times as being a, it's a time tested intervention
00:15:08 --> 00:15:12: but there's also there's some give and some takes and
00:15:12 --> 00:15:13: drawbacks.
00:15:13 --> 00:15:15: What would you say are some of the some of
00:15:15 --> 00:15:18: the positives from use of demand response and then you
00:15:19 --> 00:15:22: know, maybe talk a little bit about those drawbacks as
00:15:22 --> 00:15:22: well.
00:15:23 --> 00:15:26: And this is just an open question to anyone, but
00:15:26 --> 00:15:29: if if Sarah or Anish would like to kick things
00:15:29 --> 00:15:31: off, by all means.
00:15:32 --> 00:15:34: Yeah, I mean, I think I can.
00:15:34 --> 00:15:35: I can jump in.
00:15:36 --> 00:15:38: I think the one of the big Co benefits is
00:15:38 --> 00:15:41: that this is a, this is a new opportunity for
00:15:41 --> 00:15:45: us to demonstrate kind of a positive collaboration with utilities
00:15:45 --> 00:15:46: and so.
00:15:46 --> 00:15:49: You know as I work you know obviously electrification of
00:15:49 --> 00:15:51: of the built environment is a huge priority right now.
00:15:51 --> 00:15:53: And as I work to promote that with our new
00:15:53 --> 00:15:56: buildings, our existing buildings across our portfolio.
00:15:56 --> 00:15:59: You know one of the biggest challenges that I have
00:15:59 --> 00:16:02: is really convincing my colleagues on, you know whether it's
00:16:02 --> 00:16:05: the new development team or the operation side that the
00:16:05 --> 00:16:09: utilities will actually be able to consistently reliably deliver electric
00:16:10 --> 00:16:13: service at the amount we need whether for new construction
00:16:13 --> 00:16:16: we've we've seen some significant delays for our new.
00:16:16 --> 00:16:19: Direction starts where we're trying to do all electric and

00:16:19 --> 00:16:21: just getting the capacity out to the new to the
00:16:21 --> 00:16:24: site proves to you know slows construction down by months
00:16:24 --> 00:16:25: and months and months.
00:16:26 --> 00:16:28: So I think that to me the Co benefit of
00:16:28 --> 00:16:32: us really working kind of taking like a systems approach
00:16:32 --> 00:16:35: to this which is what absolutely has to happen is
00:16:35 --> 00:16:38: that we can have this new opportunity to kind of
00:16:38 --> 00:16:42: show have building owners, utilities and then the cities who
00:16:42 --> 00:16:45: are pushing us and regulating us to to force us
00:16:45 --> 00:16:46: to electrify.
00:16:46 --> 00:16:48: We're kind we the three parties kind of need to
00:16:48 --> 00:16:51: come together and have sort of like a positive experience
00:16:52 --> 00:16:52: around this.
00:16:52 --> 00:16:54: And I think if we can, if we can make
00:16:54 --> 00:16:56: that happen in a way that works for all three
00:16:56 --> 00:16:58: of those stakeholder groups.
00:16:59 --> 00:17:02: I think that there's a huge potential for buildings kind
00:17:02 --> 00:17:05: of really be the batteries that we need that are
00:17:05 --> 00:17:08: going to help the the grids transition to 100% renewable
00:17:08 --> 00:17:11: and have have a way to manage all that intermittent
00:17:11 --> 00:17:12: generation that's happening.
00:17:13 --> 00:17:15: So I think it's an exciting opportunity, but I don't
00:17:15 --> 00:17:16: think we're quite there.
00:17:16 --> 00:17:20: We're not seeing those Co benefits yet I think so
00:17:20 --> 00:17:24: Jonathan and Anish could, could could either of you maybe
00:17:24 --> 00:17:28: speak to like a, an instance like in practice where
00:17:28 --> 00:17:32: you know this grid interactivity has worked out.
00:17:32 --> 00:17:36: I know Tishman that has a has some properties that
00:17:36 --> 00:17:40: are sort of engaging in this already and seeing some
00:17:40 --> 00:17:43: success given certain parameters on site.
00:17:44 --> 00:17:48: And Anish, I know you've also explored this in your
00:17:48 --> 00:17:49: work at RMI.
00:17:49 --> 00:17:53: Could either of you speak to these examples in practice?
00:17:57 --> 00:18:00: I'll let Jonathan go first, because he actually manages buildings.
00:18:00 --> 00:18:01: Well, sure.
00:18:01 --> 00:18:03: I mean, I guess what I would say is, look,
00:18:03 --> 00:18:05: we see greater than that.
00:18:06 --> 00:18:08: I always pause for a moment because in my mind
00:18:08 --> 00:18:11: grid interactivity in the future is like a real time
00:18:12 --> 00:18:15: carbon signal that tells us how to adjust accordingly and
00:18:15 --> 00:18:18: to do various different types of things with that signal.

00:18:19 --> 00:18:20: That is now what's happening today, right.
00:18:20 --> 00:18:23: So to be clear that to the extent that that
00:18:23 --> 00:18:27: we participate in such things today, there's really the sort
00:18:27 --> 00:18:31: of traditional demand response programs which are fairly static in
00:18:31 --> 00:18:33: nature right there, 360 M on days and.
00:18:34 --> 00:18:36: The these four months a year and these three hour
00:18:36 --> 00:18:37: windows right in.
00:18:37 --> 00:18:39: I you know in a world where you have non
00:18:39 --> 00:18:42: fossil fuel sources on the grid and it is a
00:18:42 --> 00:18:44: reminder we have to be using New York City as
00:18:44 --> 00:18:46: example, but I'll give a different example a moment.
00:18:46 --> 00:18:50: But New York City's 98% fossil fuel grid today, time
00:18:50 --> 00:18:52: is not particularly relevant, right.
00:18:52 --> 00:18:54: And the carbon signal is going to be the same
00:18:54 --> 00:18:57: in a world where we've got 7000 offshore windmills in
00:18:57 --> 00:19:00: the Atlantic Ocean and they are blowing at various different
00:19:00 --> 00:19:00: points.
00:19:01 --> 00:19:03: You can imagine a world where there you get very
00:19:03 --> 00:19:05: different signals from the utility and the Dr.
00:19:05 --> 00:19:08: is a floating window all over the place.
00:19:08 --> 00:19:09: And who knows, it could be a night, it could
00:19:10 --> 00:19:11: be during the day, it could be on the weekends,
00:19:11 --> 00:19:13: it could be any number of of outcomes.
00:19:14 --> 00:19:16: And so there's all sorts of interesting places you can
00:19:17 --> 00:19:17: go from there.
00:19:17 --> 00:19:19: It also though brings up a bunch of other interesting
00:19:19 --> 00:19:21: issues, right, because like so for example some of the
00:19:22 --> 00:19:23: ways that we do participate in that today is that
00:19:23 --> 00:19:25: today at Rock Center and it is some of our
00:19:25 --> 00:19:27: other properties we have big thermal.
00:19:27 --> 00:19:30: Ice storage facilities or back, essentially thermal batteries that we
00:19:30 --> 00:19:32: can use and we can charge them up at night
00:19:32 --> 00:19:34: and discharge them during the day.
00:19:34 --> 00:19:37: But when we don't have a demand response event, we
00:19:37 --> 00:19:39: use those to keep the peak as low as possible.
00:19:39 --> 00:19:41: It's just a general matter of running the building.
00:19:42 --> 00:19:44: If in a future world, I need to preserve that
00:19:44 --> 00:19:46: capacity for a signal from the grid that says you
00:19:46 --> 00:19:48: need to do this at 2:00 o'clock in the morning,
00:19:48 --> 00:19:50: then you get into all sorts of interesting places that

00:19:50 --> 00:19:53: almost look like capacity markets in the grid, right?
00:19:53 --> 00:19:55: Get paid to keep that capacity available and ready, but
00:19:55 --> 00:19:56: don't actually use it.
00:19:57 --> 00:19:58: But if I don't use it, then I'm not peak
00:19:58 --> 00:19:58: shaving.
00:19:58 --> 00:20:00: So then like how do you, you know if you
00:20:00 --> 00:20:04: install these technologies for energy efficiency purposes and now suddenly
00:20:04 --> 00:20:06: you you need to be paid enough to not do
00:20:06 --> 00:20:10: those things so that you then have those resources available
00:20:10 --> 00:20:11: to adjust that signal.
00:20:11 --> 00:20:14: But my very long way of saying we don't do
00:20:14 --> 00:20:18: that today, right, We're doing standard demand response activities and
00:20:18 --> 00:20:21: they are lucrative and we can plan around them.
00:20:22 --> 00:20:24: But much of the future looks like we're going to
00:20:24 --> 00:20:26: have a lot less notice and a lot less planning.
00:20:26 --> 00:20:27: And so I think that where you go in the
00:20:27 --> 00:20:30: future is something that looks very, very different than you
00:20:30 --> 00:20:30: do today.
00:20:31 --> 00:20:32: I'll just give one note of caution as well.
00:20:33 --> 00:20:37: Petitions fire in a building or some other places put
00:20:37 --> 00:20:39: batteries in to the utility paying for.
00:20:40 --> 00:20:42: And that seemed like a great idea right up until
00:20:42 --> 00:20:44: the utility also for the privilege of paying for those
00:20:44 --> 00:20:47: batteries gets to choose when they're discharged.
00:20:47 --> 00:20:50: It never dawned on us, but that might not be
00:20:50 --> 00:20:52: when anybody was in the building, right?
00:20:52 --> 00:20:54: But now if you put a bunch of batteries in
00:20:54 --> 00:20:56: the building and the utility decides to charge them at
00:20:56 --> 00:20:58: 2:00 o'clock in the morning, the building gets no better.
00:20:58 --> 00:21:00: Right now I'm because not helping my feet, it's not
00:21:00 --> 00:21:01: helping any of those things.
00:21:01 --> 00:21:04: So now all I'm doing is storing flammable boxes for
00:21:04 --> 00:21:06: the utility and I'm not even getting paid to do
00:21:06 --> 00:21:06: it.
00:21:07 --> 00:21:10: So there's all sorts of interesting nuances in the way
00:21:10 --> 00:21:14: the system works today that that all kind of have
00:21:14 --> 00:21:17: to change to make this look like what what we
00:21:17 --> 00:21:20: think the future almost has to be in a renewable,
00:21:20 --> 00:21:22: nonconsistent power source world.
00:21:23 --> 00:21:28: I think Jake is actually really well positioned to respond

00:21:28 --> 00:21:32: to the this whole question of the utility interaction.
00:21:33 --> 00:21:37: Jake, do you have any thoughts on, we just heard
00:21:37 --> 00:21:41: the owner operator perspective what of the utility?
00:21:42 --> 00:21:42: Yeah.
00:21:42 --> 00:21:44: I mean, I think Jonathan nicely lays out some of
00:21:44 --> 00:21:47: the uncertainty and the challenges that come in if this
00:21:47 --> 00:21:48: just becomes really, truly uncertain.
00:21:49 --> 00:21:51: I suspect there probably some pathways in between, right?
00:21:51 --> 00:21:53: If you think about what assets you need on site,
00:21:54 --> 00:21:56: for what purpose, and you know if you want to
00:21:56 --> 00:21:58: say batteries on site, less to peak shave and more
00:21:58 --> 00:22:00: to have backup capacity if the system goes down.
00:22:00 --> 00:22:02: Probably less of an issue if the utility wants to
00:22:02 --> 00:22:04: run those for a couple hours or if you have
00:22:04 --> 00:22:06: a you know, onsite diesel generator.
00:22:06 --> 00:22:07: A natural gas generator.
00:22:07 --> 00:22:09: Probably not an issue if the utility wants to run
00:22:09 --> 00:22:11: it here or there, if you know if you're purely
00:22:11 --> 00:22:13: using it for backup, as long as you can have
00:22:13 --> 00:22:14: it when the lights go off.
00:22:14 --> 00:22:17: And that case of utilities will want to buy down
00:22:17 --> 00:22:19: the cost on on behalf of you know the ratepayers
00:22:19 --> 00:22:21: and get access when they when they can peak shape
00:22:21 --> 00:22:23: for the overall system then to me that's a win
00:22:23 --> 00:22:23: win.
00:22:24 --> 00:22:26: I think it gets much messier as Jonathan talks about
00:22:26 --> 00:22:29: when you start adding carbon signals in addition to just
00:22:29 --> 00:22:31: pure capacity signals and how those interact with each other
00:22:31 --> 00:22:34: is is a much more complicated problem and different priorities
00:22:34 --> 00:22:35: for different folks.
00:22:35 --> 00:22:37: And so I don't know that we've seen utilities really
00:22:37 --> 00:22:39: start to think about those forward-looking signals.
00:22:40 --> 00:22:42: I know lots of utilities are now recognizing that they
00:22:42 --> 00:22:45: need to be communicating to their customers today about what
00:22:45 --> 00:22:47: the carbon content of the grid looks like at any
00:22:47 --> 00:22:47: given hour.
00:22:47 --> 00:22:50: So that Sarah, Jonathan and their peers can actually start
00:22:50 --> 00:22:53: to look at where do we have opportunities to shift
00:22:53 --> 00:22:55: right and within your, you know the the framework you
00:22:55 --> 00:22:58: introduced earlier and where might we be able to precharge
00:22:58 --> 00:23:01: something or otherwise run a battery because we know that

00:23:01 --> 00:23:04: during these couple hours historically you know the carbon intensity

00:23:04 --> 00:23:05: has gone up.

00:23:06 --> 00:23:07: But the flip side of that of course is that

00:23:08 --> 00:23:09: there's got to be some incentive for, for the real

00:23:09 --> 00:23:11: estate operators to take advantage of that, right.

00:23:11 --> 00:23:14: And so if real estate operators are still reporting emissions

00:23:14 --> 00:23:18: based on annual average emissions factors and annual, you know,

00:23:18 --> 00:23:20: electricity consumption, I don't see an incentive, right.

00:23:20 --> 00:23:22: And so part of this to me might also need

00:23:22 --> 00:23:24: to be a regulatory, your standards shift in terms of

00:23:25 --> 00:23:27: how we think about electricity consumption and how we account

00:23:27 --> 00:23:29: for it and how we set the incentives right so

00:23:29 --> 00:23:31: that everybody's trying to drive down carbon.

00:23:33 --> 00:23:35: And are we, are we seeing this in any specific

00:23:35 --> 00:23:38: markets across the US or or even globally?

00:23:38 --> 00:23:41: Maybe maybe one example I'll share that that's more of

00:23:41 --> 00:23:43: that cost share model I talked about that I think

00:23:43 --> 00:23:45: is really interesting is an Entergy service territory.

00:23:45 --> 00:23:48: So think kind of like Gulf Coast, you know Louisiana,

00:23:48 --> 00:23:51: a couple other couple other states around there where they've

00:23:51 --> 00:23:54: they've got a regulatory approved program to more or less

00:23:54 --> 00:23:57: split the cost of a behind the meter asset mostly

00:23:57 --> 00:23:59: generation but can be batteries as well.

00:24:00 --> 00:24:03: The utility gets to call it for peak shaving purposes

00:24:03 --> 00:24:05: and to you know avoid turning on the next big

00:24:05 --> 00:24:06: combined cycle gas plant.

00:24:06 --> 00:24:09: But the grocery store, the you know, office building, the

00:24:09 --> 00:24:12: hospital etcetera gets full rights when the system goes down

00:24:12 --> 00:24:15: and the economics there work out about 5050.

00:24:15 --> 00:24:17: So you know the utility gets a basically a free,

00:24:17 --> 00:24:19: you know low cost generation asset and the asset owner

00:24:20 --> 00:24:22: again gets a really low cost resilient solution.

00:24:22 --> 00:24:24: So we're seeing a couple other markets where that kind

00:24:24 --> 00:24:25: of model is popping up.

00:24:25 --> 00:24:28: And then on the data side, I think within the

00:24:28 --> 00:24:30: EIP partner base, we've got about 7 N American utilities

00:24:30 --> 00:24:33: that are actively working to start sharing this data with

00:24:33 --> 00:24:34: customers.

00:24:34 --> 00:24:38: Different solutions, different levels of granularity, you know,

different specific

00:24:38 --> 00:24:41: business problems, But very much actively thinking about how do

00:24:41 --> 00:24:43: we help real estate operators really see what's going on,

00:24:43 --> 00:24:45: on the grid on a much more granular basis.

00:24:47 --> 00:24:49: And I know this was mentioned a little bit earlier

00:24:49 --> 00:24:52: when we when we kicked off with the technological solutions

00:24:52 --> 00:24:52: question.

00:24:53 --> 00:24:58: But how exactly does EV fit into this picture?

00:24:58 --> 00:25:04: Because there are some observations, but from a carbon accounting

00:25:04 --> 00:25:10: standpoint, it's not always clear if you can include that.

00:25:10 --> 00:25:13: In your, you know, the total building emissions.

00:25:13 --> 00:25:17: So is there incentive to to for for building owners

00:25:17 --> 00:25:21: and operators to to to try to optimize their the

00:25:21 --> 00:25:25: charging at certain times or you know, it's thinking about

00:25:25 --> 00:25:26: the broader grid.

00:25:28 --> 00:25:30: You know, how, how is that consumption going to be

00:25:30 --> 00:25:33: managed moving into the future, you know, as we move

00:25:33 --> 00:25:35: away from fossil fuel vehicles?

00:25:39 --> 00:25:42: This is a this is a question I think an

00:25:42 --> 00:25:45: issue you might have kicked things off with and.

00:25:46 --> 00:25:46: Yeah.

00:25:46 --> 00:25:49: I think that I'd like to go back to something

00:25:49 --> 00:25:53: that Sarah said earlier about the opportunity with great interactivity

00:25:53 --> 00:25:57: and electrification, which is that grid interactivity actually is a

00:25:58 --> 00:26:01: benefit in terms of enabling electrification because if we are

00:26:01 --> 00:26:04: trying to electrify all of these things.

00:26:04 --> 00:26:08: At a specific building site there are capacity constraints, constraints

00:26:08 --> 00:26:11: from the utility and great interactivity enables us to stay

00:26:11 --> 00:26:12: within those constraints.

00:26:12 --> 00:26:15: So I think the EUV conversation really fits right into

00:26:15 --> 00:26:19: that because you know we're going to anticipate that for

00:26:19 --> 00:26:25: existing parking facilities adding electrical, electric vehicle capacity, charging capacity

00:26:25 --> 00:26:28: is going to be part of you know intervention cycles

00:26:28 --> 00:26:31: as you update the the, the property and so.

00:26:32 --> 00:26:35: Having managed charging or some ability for that block of

00:26:35 --> 00:26:39: EV charging to be a managed load for the building

00:26:39 --> 00:26:42: and for the utility is going to be critical to

00:26:42 --> 00:26:44: stay within the capacity constraints.

00:26:44 --> 00:26:47: And then also you can use that you know EV
00:26:47 --> 00:26:51: project as a a catalyst for other investments like other
00:26:51 --> 00:26:56: electrification investments, other grid interactivity technology investments.
00:26:56 --> 00:26:59: So that you're thinking about this more as a suite
00:26:59 --> 00:27:00: of measures rather than.
00:27:01 --> 00:27:05: Just batteries, just EV's and just kind of individual technologies
00:27:05 --> 00:27:08: and that's something that I I just wanted to add
00:27:08 --> 00:27:12: to the conversation is that from the utility perspective as
00:27:12 --> 00:27:15: well like they they right now the way they operate
00:27:15 --> 00:27:19: is that they have technology specific programs and so you
00:27:19 --> 00:27:23: know Jonathan mentioned the battery example, you know where they
00:27:23 --> 00:27:27: they're paying for batteries to be installed in the property
00:27:27 --> 00:27:30: but there's not really an overall benefit to the the
00:27:30 --> 00:27:30: owner.
00:27:31 --> 00:27:33: And what we would like to see is a transition
00:27:34 --> 00:27:36: by utilities to a multi technology program.
00:27:36 --> 00:27:40: So they're not just thinking about 1 technology in isolation,
00:27:40 --> 00:27:44: they're actually thinking about how they could integrate batteries, smart
00:27:44 --> 00:27:47: thermostats, EV charging, all these things together.
00:27:47 --> 00:27:50: And that way you can get to this place where
00:27:50 --> 00:27:53: it's mutually beneficial for both utility and for the building
00:27:53 --> 00:27:54: owner.
00:27:55 --> 00:27:55: Yeah.
00:27:56 --> 00:27:58: And I would just add that you know as a
00:27:58 --> 00:28:01: building owner, I think right sizing the amount of charging
00:28:01 --> 00:28:03: is a really challenging thing right now because I think
00:28:03 --> 00:28:06: we're at this interesting point where you know we can
00:28:06 --> 00:28:08: all see where this is headed.
00:28:08 --> 00:28:11: But will we really all need to be charging vehicles
00:28:11 --> 00:28:13: all the time, like what's the right amount to do
00:28:13 --> 00:28:16: at an office Because it it's like one of those
00:28:16 --> 00:28:18: fast chargers is as much juice as a coffee shop.
00:28:19 --> 00:28:21: You know, it's like it's a really big load and
00:28:21 --> 00:28:24: if we want to add a lot of them it's
00:28:24 --> 00:28:25: it's a really significant.
00:28:26 --> 00:28:28: Challenge for the grid, for the building owner for all
00:28:28 --> 00:28:30: sorts of all sorts of different places.
00:28:30 --> 00:28:32: So I also you know I think an issues comment
00:28:32 --> 00:28:35: earlier about where this this is kind of where I

00:28:35 --> 00:28:37: I do see a real opportunity for new technology whereas
00:28:37 --> 00:28:39: I think with a lot of other things we've got
00:28:39 --> 00:28:40: the tools already.
00:28:41 --> 00:28:42: But I think that kind of two way communication.
00:28:42 --> 00:28:46: The chargers, I hope that the existing chargers, charging stations
00:28:46 --> 00:28:49: that we have can get smarter without us updating the
00:28:50 --> 00:28:52: infrastructure so that there can be a kind of the
00:28:52 --> 00:28:55: you can be smartly turning them on and off.
00:28:55 --> 00:28:56: The right times and all that.
00:28:56 --> 00:28:59: So the charging landscape I think is really complicated right
00:28:59 --> 00:28:59: now.
00:29:00 --> 00:29:02: I'll just say the one thing in the night also
00:29:02 --> 00:29:04: think is just hilarious is that on the charging side
00:29:04 --> 00:29:06: you get all these folks like, well, you need to
00:29:06 --> 00:29:09: future proof your assets for 100% of the spots, even
00:29:09 --> 00:29:10: though you only need to do 10% now.
00:29:11 --> 00:29:14: And it's like, OK, well you're aware that's not how
00:29:14 --> 00:29:14: utilities work.
00:29:15 --> 00:29:17: I can't go to the utility and be like can
00:29:17 --> 00:29:20: you please put it in a transformer that serves 800
00:29:20 --> 00:29:21: vehicles today?
00:29:22 --> 00:29:24: Because in the future that will happen.
00:29:24 --> 00:29:28: That is not how utility rate structures and asset systems
00:29:28 --> 00:29:28: work.
00:29:28 --> 00:29:30: You have to show the load you're going to do
00:29:30 --> 00:29:30: now.
00:29:30 --> 00:29:33: And so the whole idea that I constantly hear from
00:29:33 --> 00:29:37: legislators and other about future proofing on EV is completely
00:29:37 --> 00:29:41: contrary to how the actual public service commissions and states
00:29:41 --> 00:29:45: actually approve asset level plans to install utility equipment.
00:29:45 --> 00:29:48: Now, obviously lots of people are talking about changing that
00:29:48 --> 00:29:50: for EV's, creating special rates for EV's, doing all sorts
00:29:50 --> 00:29:51: of other things.
00:29:51 --> 00:29:54: But the current thought process is that the owner should
00:29:54 --> 00:29:57: just spend both loads of money on things that happen
00:29:57 --> 00:29:58: far, far down into the future.
00:29:58 --> 00:30:01: And utilities are going to go along with you, because
00:30:01 --> 00:30:04: that's not going to be the way it goes, more
00:30:04 --> 00:30:04: than likely.
00:30:07 --> 00:30:09: Yeah, maybe just a couple of thoughts and just to

00:30:09 --> 00:30:12: just to build on everybody's good input.
00:30:13 --> 00:30:14: First of all, I may be more of a skeptic
00:30:14 --> 00:30:17: in terms of the actual the infrastructure needs for large
00:30:17 --> 00:30:18: buildings.
00:30:18 --> 00:30:21: Taking multifamily aside, I think multifamily is a separate category.
00:30:21 --> 00:30:25: But but for offices maybe you know hotels, hospitals, etc
00:30:25 --> 00:30:25: like.
00:30:26 --> 00:30:28: Most folks who have, you know, Ev's with a couple
00:30:28 --> 00:30:30: 100 miles of range aren't really needing to charge their,
00:30:30 --> 00:30:31: you know, car at the office.
00:30:31 --> 00:30:33: Now it's they're free electrons, right, that somebody else is
00:30:33 --> 00:30:34: paying for perhaps.
00:30:34 --> 00:30:37: So they might be incented to, but they don't really
00:30:37 --> 00:30:37: need to.
00:30:37 --> 00:30:39: And so how big the scale is, Jonathan, to your
00:30:39 --> 00:30:41: point, whether it's actually 10% or 2%, you know, I
00:30:41 --> 00:30:44: feel pretty positive it's not going to be 100%.
00:30:45 --> 00:30:47: Interesting Jake though that that is not what the city
00:30:47 --> 00:30:49: council's in many cities have told me.
00:30:50 --> 00:30:51: So I I you know, I find that to be
00:30:51 --> 00:30:53: a very interesting piece of information because I haven't agree
00:30:53 --> 00:30:55: with that, but that is not how codes enrolled.
00:30:56 --> 00:30:56: Totally.
00:30:56 --> 00:30:58: Now, you could convince me maybe something like that for
00:30:58 --> 00:30:59: multifamily.
00:30:59 --> 00:31:01: Again, if you envision a world where everybody has a
00:31:01 --> 00:31:03: need to be, you need to make sure that folks
00:31:03 --> 00:31:04: don't get stuck without a charge.
00:31:04 --> 00:31:07: But I do think the managed charging angle is really
00:31:07 --> 00:31:09: exciting, Probably much more positive on that than I am
00:31:09 --> 00:31:11: on vehicle to grid for example, which I think is
00:31:11 --> 00:31:13: complicated for a lot of reasons.
00:31:14 --> 00:31:16: So manage charging, you know, I think folks hit on
00:31:16 --> 00:31:16: it.
00:31:16 --> 00:31:18: Having two V's at a resident Ev's at a residential
00:31:18 --> 00:31:20: home basically double s your load, right?
00:31:20 --> 00:31:23: And if everybody's doing that at exactly the same time,
00:31:23 --> 00:31:25: 5:00 PM to 7:00 PM charging their car for the
00:31:25 --> 00:31:27: next day, the grid's going to blow on a, you
00:31:27 --> 00:31:29: know, distribution level really quickly everywhere.
00:31:30 --> 00:31:32: So EI P's invested in a company called EV dot

00:31:32 --> 00:31:33: Energy.

00:31:33 --> 00:31:36: There's a bunch of others that are doing similar solutions

00:31:36 --> 00:31:39: that is both white labeling products with utilities but also

00:31:39 --> 00:31:41: integrating direct with auto Oem's.

00:31:41 --> 00:31:43: And in essence, you can set the signal.

00:31:43 --> 00:31:44: You can say I need this car to be at

00:31:44 --> 00:31:46: 80% every day by 6:00 in the morning.

00:31:47 --> 00:31:49: And then they go find the incentives and they charge

00:31:49 --> 00:31:51: it when it makes the most sense for the grid.

00:31:51 --> 00:31:54: They've also, interestingly, Jonathan, to send me your your points

00:31:54 --> 00:31:57: earlier about carbon signals, they've got a partnership with Newfoundland

00:31:57 --> 00:31:59: Power up in Newfoundland where they're taking signals from the

00:31:59 --> 00:32:02: offshore wind farm and pushing everybody on the phone and

00:32:02 --> 00:32:04: saying, hey right now is 100% carbon free.

00:32:04 --> 00:32:06: Would you like to start charging as one?

00:32:06 --> 00:32:08: You know, it's still a little manual, but you know

00:32:08 --> 00:32:09: one signal there.

00:32:10 --> 00:32:12: But yeah, the infrastructure build out costs to service a

00:32:12 --> 00:32:14: whole office building are gonna be massive.

00:32:14 --> 00:32:17: And if you wanna do fast driving, it's even more

00:32:17 --> 00:32:17: than that.

00:32:17 --> 00:32:19: And it's not clear that that's the best use of

00:32:19 --> 00:32:19: power.

00:32:19 --> 00:32:22: So a little skeptical of whether we really need all

00:32:22 --> 00:32:26: this infrastructure at scale, at least in the office sector.

00:32:27 --> 00:32:27: So.

00:32:29 --> 00:32:32: Just a just a question and moving out again like

00:32:32 --> 00:32:35: zooming out from the from the EV charging question which

00:32:36 --> 00:32:39: is it seems like it has like vast implications both

00:32:39 --> 00:32:42: for utilities and for building owners and operators and more

00:32:42 --> 00:32:43: generally.

00:32:43 --> 00:32:47: So what kind of strategic interventions might there be for

00:32:47 --> 00:32:52: just more generally incorporating grid interactivity into an existing building?

00:32:53 --> 00:32:55: You know understanding that we have a lot of like

00:32:55 --> 00:32:58: most of our building stock is like it's already there.

00:32:59 --> 00:33:02: And so we we we can plan for you know

00:33:02 --> 00:33:07: new construction to to have these you know smart devices

00:33:07 --> 00:33:11: like smart building automation, control systems etcetera.

00:33:11 --> 00:33:15: But what about, you know, buildings built back in the

00:33:15 --> 00:33:17: 1930s, both commercial and residential?

00:33:18 --> 00:33:19: What?

00:33:19 --> 00:33:21: What is in the cards for them and how?

00:33:21 --> 00:33:26: How do we move from, you know, these siloed structures

00:33:26 --> 00:33:29: consuming, consuming power?

00:33:31 --> 00:33:35: You know large amounts of power in an inefficient ways

00:33:35 --> 00:33:38: to more responsive existing structures.

00:33:39 --> 00:33:43: Is and that would include, you know, the the installation

00:33:43 --> 00:33:45: of the installation of Ev's.

00:33:45 --> 00:33:48: But it also might include other other sorts of retrofits.

00:33:48 --> 00:33:50: Any any thoughts on this?

00:33:50 --> 00:33:54: The strategic interventions for incorporating good interactivity.

00:33:55 --> 00:33:55: Sure.

00:33:55 --> 00:33:58: So I think that, you know, probably preaching to the

00:33:58 --> 00:34:03: choir and many building owners have already incorporated these technologies.

00:34:03 --> 00:34:05: But you know, at a fundamental level, there's.

00:34:06 --> 00:34:12: Retro commissioning, which is you're just tuning the building systems

00:34:12 --> 00:34:16: that you have and that's a really great intervention point

00:34:16 --> 00:34:20: to enable some very fundamental, great interactivity.

00:34:21 --> 00:34:24: You know what, if you have zone level controls, you

00:34:24 --> 00:34:27: can, you know, have temperature setbacks that are on a

00:34:27 --> 00:34:28: schedule.

00:34:28 --> 00:34:32: Really simple fundamental things like that, that can in aggregate

00:34:32 --> 00:34:32: like.

00:34:32 --> 00:34:35: Provide a lot of savings from a cost and energy

00:34:35 --> 00:34:35: perspective.

00:34:35 --> 00:34:39: So that's kind of one O 1 level stuff and

00:34:40 --> 00:34:43: then you know looking at how.

00:34:43 --> 00:34:47: You know cycles work in the real estate sector when

00:34:47 --> 00:34:51: leases turn over, when tenants are doing throughout projects thinking

00:34:51 --> 00:34:56: about those points as opportunities to add great interactivity and

00:34:56 --> 00:35:00: and invest in great interactivity if you have tenant spaces

00:35:00 --> 00:35:00: that have.

00:35:00 --> 00:35:04: Older controls using a tenant fit out project as an

00:35:04 --> 00:35:09: opportunity to incorporate really high fidelity zone level controls that

00:35:09 --> 00:35:13: have you know strong metering so you can really track

00:35:13 --> 00:35:17: where energy is being used because you can't manage what

00:35:17 --> 00:35:19: you don't really control.
00:35:19 --> 00:35:22: So adding control at the zone level I would say
00:35:22 --> 00:35:25: is another piece is getting in this controls in at
00:35:26 --> 00:35:27: the zone level and then so.
00:35:29 --> 00:35:32: The zonal controls I think are are really compelling argument
00:35:32 --> 00:35:35: and and if I recall correctly you can also this
00:35:36 --> 00:35:39: is something that can be layered on top of those
00:35:39 --> 00:35:40: central controls.
00:35:40 --> 00:35:43: So that's it's a it's a it's a more cost
00:35:43 --> 00:35:46: effective solution at least in the short term.
00:35:47 --> 00:35:50: So I'm I'm sort of wondering though when you're when
00:35:50 --> 00:35:52: you're dealing with structures that are.
00:35:53 --> 00:35:58: Not quite outfitted with so many connected devices, is it
00:35:58 --> 00:36:02: possible to to, you know, link them up to the
00:36:02 --> 00:36:04: to the grid infrastructure?
00:36:04 --> 00:36:08: Is it possible to integrate them or integrate insights from
00:36:08 --> 00:36:12: these from these buildings that are still on pneumatics in
00:36:12 --> 00:36:13: some cases?
00:36:15 --> 00:36:19: Into some sort of like system that'll that'll allow greater
00:36:19 --> 00:36:22: insight into what's going on in hour to hour or
00:36:22 --> 00:36:24: in some cases minute to minute.
00:36:25 --> 00:36:27: And this is a question for Jonathan.
00:36:33 --> 00:36:35: Well, I guess, you know the the hour to hour
00:36:35 --> 00:36:38: to minute to minute kept into some of the topics
00:36:38 --> 00:36:41: that we just talked about, which is that it's, it's,
00:36:41 --> 00:36:44: you know, we would love to get to a world
00:36:44 --> 00:36:47: where that looks like that's where we are, but that's
00:36:47 --> 00:36:49: not where we are today.
00:36:50 --> 00:36:52: And again, we haven't really had to act in that
00:36:52 --> 00:36:53: fashion in the past.
00:36:53 --> 00:36:56: So I think as we talked about a little bit
00:36:56 --> 00:36:59: earlier, like a lot of if if that kind of
00:36:59 --> 00:37:03: world is where we're going, then we're going to need
00:37:03 --> 00:37:04: to have it.
00:37:04 --> 00:37:06: It's going to be very difficult for that to be
00:37:06 --> 00:37:07: done maybe right.
00:37:07 --> 00:37:09: And so and and therefore you get back into sort
00:37:09 --> 00:37:12: of the questions about grid and activity in terms of
00:37:12 --> 00:37:14: today we do everything manually.
00:37:14 --> 00:37:16: And again as I showed earlier, that's not because we
00:37:16 --> 00:37:18: didn't have the thought of automation would be great.
00:37:19 --> 00:37:22: It's specifically because we have a different imperative in

terms
00:37:22 --> 00:37:24: of being office building owners and where the revenue comes
00:37:24 --> 00:37:26: from and where the goal is.
00:37:26 --> 00:37:29: And so if you think about getting very, very granular
00:37:30 --> 00:37:33: and very, very sort of detailed in how you would
00:37:33 --> 00:37:36: operate, again in that kind of time frame, right.
00:37:36 --> 00:37:38: It's very hard to imagine that can be done in
00:37:38 --> 00:37:39: a manual fashion.
00:37:39 --> 00:37:42: And so you're then looking at doing things that are
00:37:42 --> 00:37:45: way, way, way more complicated than we'll be today.
00:37:45 --> 00:37:48: Complicated in the sense that we would need to build
00:37:48 --> 00:37:50: out systems that that like new things need to be
00:37:50 --> 00:37:50: invented.
00:37:50 --> 00:37:53: But you need to have all sorts of parameters around
00:37:53 --> 00:37:55: what you're willing to give, what at, at what various
00:37:55 --> 00:37:57: moments in time and how that would all be set
00:37:57 --> 00:38:00: up in advance to understand that, like you know that
00:38:00 --> 00:38:02: certain times of the day we can give more than
00:38:02 --> 00:38:03: other times of the day.
00:38:03 --> 00:38:04: But it also depends on the weather.
00:38:04 --> 00:38:07: And you could just see how many inputs and the
00:38:07 --> 00:38:08: complexity that it gets.
00:38:08 --> 00:38:09: The advantage of Dr.
00:38:09 --> 00:38:10: today is it's not that complicated.
00:38:11 --> 00:38:11: Right.
00:38:11 --> 00:38:12: It's actually pretty straightforward.
00:38:12 --> 00:38:12: Right.
00:38:12 --> 00:38:13: Like, yeah.
00:38:13 --> 00:38:15: And for all the joke of like, whatever it they
00:38:15 --> 00:38:16: literally call.
00:38:16 --> 00:38:16: Right.
00:38:16 --> 00:38:19: And say it's coming and then you, you know, take
00:38:19 --> 00:38:20: appropriate action.
00:38:20 --> 00:38:22: But in all, even in the hour ahead market, because
00:38:22 --> 00:38:25: there's 24 hour ahead and hour ahead, you still get
00:38:25 --> 00:38:27: an hour ahead and you still get time to figure
00:38:27 --> 00:38:29: out how you're going to do that.
00:38:29 --> 00:38:30: And so in a world where you have to get
00:38:31 --> 00:38:33: way, way, way more granular than that, it, it's very
00:38:33 --> 00:38:35: hard to see how that wouldn't be done in a
00:38:35 --> 00:38:37: very different way than today.
00:38:37 --> 00:38:40: And so again I don't think it's new technology per

00:38:40 --> 00:38:43: se, but how we run buildings, how we think about
00:38:43 --> 00:38:45: that, how we train our operators and how all of
00:38:45 --> 00:38:49: that somehow works with utility would have to change fairly
00:38:49 --> 00:38:49: dramatically.
00:38:51 --> 00:38:53: I I would you know just to briefly touch on
00:38:53 --> 00:38:57: the point you made before though that we just talked
00:38:57 --> 00:38:57: about.
00:38:57 --> 00:38:59: I would also you know the the two buildings where
00:38:59 --> 00:39:01: we have large scale thermal storage systems are in old
00:39:01 --> 00:39:02: buildings.
00:39:02 --> 00:39:05: I mean our our rock centers from 1930s and we
00:39:05 --> 00:39:08: have another large system in in an office tower from
00:39:08 --> 00:39:08: the 80s.
00:39:09 --> 00:39:12: I don't actually think age plays a huge role in
00:39:12 --> 00:39:14: doing things like that.
00:39:14 --> 00:39:17: Age may play more of a role though in if
00:39:17 --> 00:39:20: you open a brand new Class A office building, you're
00:39:20 --> 00:39:22: going to have a, just by the nature of today's
00:39:23 --> 00:39:26: technology, a much fancier and much more plugged in Vms.
00:39:26 --> 00:39:28: And you might imagine that that is what is needed
00:39:28 --> 00:39:30: to do many of the automated things.
00:39:30 --> 00:39:32: I mean, not that we don't have Vms in these
00:39:32 --> 00:39:34: buildings, but I mean like when we open a brand
00:39:34 --> 00:39:36: new Class A building, the number of points in the
00:39:36 --> 00:39:38: BMS, the number of things we're monitoring, the algorithms that
00:39:38 --> 00:39:40: go into that are just way more sophisticated than what
00:39:40 --> 00:39:42: is in the BMS from 20 years ago.
00:39:42 --> 00:39:44: And so a newer building is going to have greater
00:39:44 --> 00:39:46: ability in theory to do all of the sort of
00:39:46 --> 00:39:49: things that would be required to get down to very,
00:39:49 --> 00:39:51: very granular one minute or five minute.
00:39:52 --> 00:39:54: But at the same time, you could do that in
00:39:54 --> 00:39:55: an older building.
00:39:55 --> 00:39:57: It's just a matter of spending the capital to do
00:39:57 --> 00:39:58: so.
00:39:58 --> 00:40:01: The trick is that you probably wouldn't pay to do
00:40:01 --> 00:40:04: that under today's rate structures and demand response.
00:40:05 --> 00:40:05: Universes.
00:40:05 --> 00:40:09: So you would need to create outcomes where owners would
00:40:09 --> 00:40:11: want to spend the money to buy and install very
00:40:11 --> 00:40:15: sophisticated granular systems to then be able to respond to

00:40:15 --> 00:40:16: those signals.
00:40:16 --> 00:40:18: But that gets back to why would I do that
00:40:18 --> 00:40:20: unless I'm going to be paid to do that, which
00:40:20 --> 00:40:22: means we have to pay people very differently to provide
00:40:22 --> 00:40:23: those services than what we do today.
00:40:25 --> 00:40:26: And I would just add that you know from.
00:40:28 --> 00:40:30: I I think we are starting to see especially in
00:40:30 --> 00:40:33: markets where we're just seeing really steep increases in electricity
00:40:33 --> 00:40:35: rates and the and the prices that we're paying.
00:40:35 --> 00:40:39: I think we're seeing a stronger signal to better manage
00:40:39 --> 00:40:40: efficiency.
00:40:40 --> 00:40:42: And so I think that's where we we're close to
00:40:42 --> 00:40:45: having deployed at all of our all of our assets
00:40:45 --> 00:40:47: old and old and young sort of a a more
00:40:47 --> 00:40:51: real time data management tool that's consistent across the whole
00:40:51 --> 00:40:55: portfolio because the the problem becomes that each building has
00:40:55 --> 00:40:57: its kind of different BMS system and.
00:40:58 --> 00:40:59: A few people look at this one and a few
00:40:59 --> 00:41:01: people look at this one, but we're we're now making
00:41:01 --> 00:41:04: it more consistent so that we're on one platform and
00:41:04 --> 00:41:06: we get that sort of 15 minute interval data.
00:41:06 --> 00:41:08: And I think what what I'm finding is that it's
00:41:08 --> 00:41:11: helping our engineering team they're they're looking at at the
00:41:11 --> 00:41:14: peaks and so they're they're saying you know what was
00:41:14 --> 00:41:14: happening there.
00:41:15 --> 00:41:18: It gives them the data visualization to get curious about
00:41:18 --> 00:41:20: why do we set our peak demand charge on a
00:41:21 --> 00:41:23: Saturday at 9:00 AM, you know, kind of for that
00:41:23 --> 00:41:27: billing period, why what, what was happening in the building
00:41:27 --> 00:41:27: at that?
00:41:28 --> 00:41:29: And asking some good questions.
00:41:29 --> 00:41:32: And I I think the other thing that it's helping
00:41:32 --> 00:41:34: us do is and it it relates back to kind
00:41:34 --> 00:41:37: of the grid interactivity and I think the promise of
00:41:37 --> 00:41:40: this is it's giving us I think the the additional
00:41:40 --> 00:41:42: data, so the 15 minute interval data.
00:41:43 --> 00:41:46: Plus the situation which we don't love right now, but
00:41:46 --> 00:41:49: we have lower than normal occupancy in our buildings is
00:41:49 --> 00:41:51: kind of a unique opportunity for us to be able
00:41:51 --> 00:41:54: to test out and kind of challenge the engineering teams

00:41:54 --> 00:41:57: to come up with what kind of load could you

00:41:57 --> 00:42:00: shed and sort of some scenario planning around load shedding

00:42:00 --> 00:42:01: and load shifting.

00:42:02 --> 00:42:04: And I think the lower occupancy that we have in

00:42:05 --> 00:42:08: our buildings right now gives us an ability to test

00:42:08 --> 00:42:10: out some of that in a way that we might

00:42:10 --> 00:42:13: not have in a completely full operational time.

00:42:13 --> 00:42:16: And so I think we're trying to use this time

00:42:16 --> 00:42:19: as as an opportunity to learn about like what are

00:42:19 --> 00:42:21: those loads that we can easily shift or shed that

00:42:22 --> 00:42:25: really don't impact you know the occupants at all and

00:42:25 --> 00:42:27: then that that becomes a no brainer for how to

00:42:27 --> 00:42:30: operate our buildings going forward.

00:42:31 --> 00:42:31: Yeah.

00:42:31 --> 00:42:34: And I think you've you've like stolen my my next

00:42:34 --> 00:42:37: question which is how do you scale this across your

00:42:37 --> 00:42:40: portfolios and it it sounds like you got to start

00:42:40 --> 00:42:42: with a pilot and then or or start to pilot

00:42:42 --> 00:42:43: now?

00:42:43 --> 00:42:47: In view of you know future future improvements rolled out

00:42:48 --> 00:42:52: portfolio wide, but thinking about the the regulatory landscape in

00:42:52 --> 00:42:57: which these these changes are being made, these decisions, the

00:42:57 --> 00:42:58: decisions are being made.

00:42:59 --> 00:43:02: I'm kind of curious, one, are there any, any specific

00:43:02 --> 00:43:06: policies or regulations that you've seen being rolled out and

00:43:06 --> 00:43:10: like and what markets specifically are the leaders that you're

00:43:10 --> 00:43:13: seeing within the US or or again globally?

00:43:14 --> 00:43:18: That are that are leading in terms of like policies

00:43:18 --> 00:43:22: that are that that allow for grid interactivity or or

00:43:22 --> 00:43:27: maybe even just grid interactivity friendly markets in general.

00:43:31 --> 00:43:33: Yeah, you know I don't have, don't know that we've

00:43:33 --> 00:43:35: got a like shining example to point to.

00:43:35 --> 00:43:37: I mean I'm looking around at all of us and

00:43:37 --> 00:43:39: we're all kind of stumped on like the one place

00:43:39 --> 00:43:42: that's nailed it, which which to me says something.

00:43:42 --> 00:43:43: I don't know if others others actually have one.

00:43:43 --> 00:43:46: But yeah, I'm struggling to point to the the best

00:43:46 --> 00:43:48: practice, at least working perspective.

00:43:48 --> 00:43:51: I mean, I don't think anything close to where you

00:43:51 --> 00:43:53: need to be in the future, if only because we

00:43:53 --> 00:43:55: can already see the challenge.

00:43:55 --> 00:43:57: I mean, I guess put a sudden different way, the

00:43:57 --> 00:44:00: market that has the largest problem in this regard today

00:44:00 --> 00:44:01: is clearly the California grid.

00:44:01 --> 00:44:04: I mean it's, I mean, although the Texas grid is

00:44:04 --> 00:44:07: getting there on certain days as well.

00:44:07 --> 00:44:10: You know, the fascinating thing about the Texas and California

00:44:10 --> 00:44:12: grids is that they both are facing many of the

00:44:12 --> 00:44:17: same challenges, but they're completely organized differently, they're regulated completely

00:44:17 --> 00:44:17: differently.

00:44:17 --> 00:44:21: They have completely different goals besides keeping the lights on,

00:44:21 --> 00:44:24: and yet they're facing many of the same challenges right

00:44:24 --> 00:44:25: now.

00:44:25 --> 00:44:28: And so I guess a long way of saying, even

00:44:28 --> 00:44:31: with gigantic incentives to figure out how to have the

00:44:32 --> 00:44:35: lights stay on, neither of those states have figured it

00:44:35 --> 00:44:36: out, right?

00:44:36 --> 00:44:39: And it's nice to contrast those two because again they've

00:44:39 --> 00:44:43: taken diametrically different ways to approach this and are governed

00:44:43 --> 00:44:46: by states that look very different on a political spectrum

00:44:46 --> 00:44:47: basis.

00:44:47 --> 00:44:49: And yet somehow they've ended up with roughly the same

00:44:49 --> 00:44:50: type of problems.

00:44:50 --> 00:44:52: So it's a kind of interesting, I give it as

00:44:52 --> 00:44:53: sort of working backwards from your question.

00:44:53 --> 00:44:56: But to say a lot of folks are trying to

00:44:56 --> 00:44:58: answer these questions and in the two grades where they

00:44:59 --> 00:45:02: might have the largest financial imperative to solve those problems,

00:45:02 --> 00:45:05: nobody has come close to solving those problems and they're

00:45:05 --> 00:45:07: trying very different things.

00:45:08 --> 00:45:10: So I would suggest that not only is there no

00:45:10 --> 00:45:13: shining example, but essentially what we have is a lot

00:45:13 --> 00:45:14: of examples of like.

00:45:15 --> 00:45:17: I don't want that that are not working, but that

00:45:17 --> 00:45:18: are certainly not optimal.

00:45:20 --> 00:45:22: I've certainly seen a few, few markets that are trying

00:45:22 --> 00:45:24: to think about how do we solve the the time

00:45:24 --> 00:45:26: to power problem, which is another piece of this that
00:45:26 --> 00:45:27: Sarah had on right.
00:45:27 --> 00:45:30: Like it's now taking a lot longer to get connectivity
00:45:30 --> 00:45:33: and so trying to think about different ways of encouraging
00:45:33 --> 00:45:35: flexibility as a way to speed up connection.
00:45:35 --> 00:45:38: Nobody that's got anything that I'm comfortable speaking about publicly
00:45:38 --> 00:45:40: or that's regulatorily approved at this point, but.
00:45:41 --> 00:45:43: You know the peaks that are causing these delays in
00:45:43 --> 00:45:46: connectivity at least from a, you know generation capacity perspective
00:45:46 --> 00:45:47: are a couple 100 hours a year, right.
00:45:47 --> 00:45:49: It's not, not year round.
00:45:50 --> 00:45:52: And so it's likely that in some markets if you
00:45:52 --> 00:45:54: had the right incentives and you were willing to use
00:45:54 --> 00:45:57: some onsite generation during certain hours or to ramp down
00:45:57 --> 00:45:59: your systems at certain hours, you could probably get a
00:45:59 --> 00:46:01: utility comfortable moving quicker.
00:46:02 --> 00:46:03: But they're not.
00:46:03 --> 00:46:05: They don't have the structures in place to necessarily act
00:46:05 --> 00:46:08: on that, nor the kind of, you know, demand interconnection
00:46:08 --> 00:46:10: queue, process to to actually make that happen in practice.
00:46:10 --> 00:46:13: But the problem is much is much simpler in some
00:46:13 --> 00:46:15: cases than the the big macro.
00:46:15 --> 00:46:17: We can't connect to anybody all the time and we
00:46:17 --> 00:46:18: just don't have enough power.
00:46:18 --> 00:46:20: It's much more nuanced and granular and whatnot.
00:46:21 --> 00:46:23: But I want to go back to sort of a
00:46:23 --> 00:46:26: point that was alluded to and and and Folks's responses
00:46:27 --> 00:46:31: to that question which is the climate resilience component specifically.
00:46:31 --> 00:46:36: You know, knowing that you know certain critical infrastructure needs
00:46:36 --> 00:46:40: to be able to have power available during during at
00:46:40 --> 00:46:40: all times.
00:46:41 --> 00:46:44: And then you know, understanding that these jurisdictions have, you
00:46:44 --> 00:46:47: know they they have a responsibility and the utility providers
00:46:47 --> 00:46:50: as well have a responsibility to ensure that you know
00:46:50 --> 00:46:51: this this energy is.
00:46:51 --> 00:46:52: Available at any given time.
00:46:52 --> 00:46:55: Is that not a big driver behind some of the
00:46:55 --> 00:46:57: policies that are emerging?

00:46:57 --> 00:47:01: And you've sort of touched on how that might not
00:47:01 --> 00:47:04: be working very well right now, but are there any
00:47:04 --> 00:47:09: tangible examples of policies that you've seen that have sort
00:47:09 --> 00:47:09: of?
00:47:10 --> 00:47:13: Made it possible to to supply power in times of
00:47:13 --> 00:47:17: emergencies or times when you know the peak demand is
00:47:17 --> 00:47:21: exceeding previous years, previous years like you know as a
00:47:21 --> 00:47:24: result of potentially as a result of climate impacts.
00:47:24 --> 00:47:27: Are there any, are there any thoughts on on the
00:47:27 --> 00:47:31: resilience component here in addition to any thoughts on the
00:47:31 --> 00:47:35: value of having one regulations and two structures that are
00:47:35 --> 00:47:36: able to respond?
00:47:37 --> 00:47:41: To grid conditions and operate autonomously in case of widespread
00:47:41 --> 00:47:42: outages.
00:47:44 --> 00:47:47: Yeah, I I think that folks have have said that
00:47:47 --> 00:47:50: at the at the regional or like I SO level,
00:47:50 --> 00:47:55: there are not structures in place that really create incentives
00:47:55 --> 00:47:58: and guidance for the smaller utility providers.
00:47:59 --> 00:48:02: But if you look at individual utilities, I do think
00:48:02 --> 00:48:06: there are some really shining and good examples of how
00:48:06 --> 00:48:11: demand flexibility has provided resilience and reliability during a crisis.
00:48:11 --> 00:48:14: So a couple of examples that I wanted to reference.
00:48:14 --> 00:48:17: One is in in Australia where a couple of years
00:48:17 --> 00:48:21: ago they had a coal-fired power plant that tripped offline
00:48:21 --> 00:48:24: that was, you know, leaving a gap of 748 MW
00:48:24 --> 00:48:26: hours for megawatts, so.
00:48:26 --> 00:48:28: That's a that's a huge gap to make up.
00:48:28 --> 00:48:32: And so they had a virtual power plant that was
00:48:32 --> 00:48:37: able to aggregate enough demand to alleviate that gap.
00:48:38 --> 00:48:42: And similarly there's examples in Arizona, in New England where
00:48:42 --> 00:48:47: during these peak periods there has been aggregation of thermostats
00:48:48 --> 00:48:52: and you know, other resources to shed load and actually.
00:48:52 --> 00:48:54: Provide good reliability.
00:48:54 --> 00:48:56: So I do think that as there as more of
00:48:56 --> 00:49:01: these examples come into play and are demonstrate the viability
00:49:01 --> 00:49:04: of it then then we can actually look at regulations
00:49:04 --> 00:49:07: and guidance from the the you know I SO is
00:49:07 --> 00:49:12: in the regional transmission authorities which are the ones

that

00:49:12 --> 00:49:14: I feel like are lagging on this front.

00:49:17 --> 00:49:20: Maybe just one thought for me around resilience and specifically

00:49:20 --> 00:49:24: thinking about onsite generation, both diesel and natural gas and

00:49:24 --> 00:49:24: batteries.

00:49:25 --> 00:49:27: First of all, in some ways they might be a

00:49:27 --> 00:49:29: nice Trojan horse in the grid enabled buildings, right?

00:49:29 --> 00:49:32: Because they don't require the same level of building automation,

00:49:32 --> 00:49:33: smart technology, right?

00:49:33 --> 00:49:35: They can kind of sit adjacent.

00:49:37 --> 00:49:39: But there's also this interesting challenge with a lot of

00:49:39 --> 00:49:42: those where if you have diesel generators and they're not

00:49:42 --> 00:49:44: the most recent kind of highest quality from a performance

00:49:44 --> 00:49:47: perspective, they can't run really unless it's truly an emergency,

00:49:47 --> 00:49:49: unless the system goes down.

00:49:49 --> 00:49:51: And so you end up with some weird situations where

00:49:51 --> 00:49:55: there are system challenges, there are potential capacity shortages.

00:49:55 --> 00:49:57: But it's not like there was a wildfire or a

00:49:57 --> 00:49:58: coal plant went down.

00:49:58 --> 00:50:01: And so technically they can't run in those environments.

00:50:01 --> 00:50:03: And so, you know, at EIP we're trying to think

00:50:03 --> 00:50:05: about what are the next generation of technologies that don't

00:50:06 --> 00:50:08: have those same air quality or local pollution restrictions associated

00:50:09 --> 00:50:11: with them, may or may not have minimal, you know,

00:50:11 --> 00:50:13: carbon emissions, but real carbon emissions associated with them.

00:50:13 --> 00:50:16: But they can provide some flexibility, sit at the grid

00:50:16 --> 00:50:20: edge, avoid major carbon emissions from, you know, another large

00:50:20 --> 00:50:20: peaker plant.

00:50:22 --> 00:50:23: Yeah, don't run afoul with some of those rules.

00:50:23 --> 00:50:26: So I think this whole area of resilience is both

00:50:26 --> 00:50:30: natural disasters, but then also the just grid tripping and

00:50:30 --> 00:50:32: rolling blackouts and whatnot.

00:50:33 --> 00:50:37: Definitely an opportunity for those onsite resources to be leveraged.

00:50:38 --> 00:50:40: So I want to just pause for one quick moment

00:50:40 --> 00:50:43: to remind our attendees that you can share any questions

00:50:43 --> 00:50:45: that you have in the Q&A subsection.
00:50:45 --> 00:50:49: Additionally, we'll be moving into what we've already sort of
00:50:49 --> 00:50:51: begun to move into audience Q&A.
00:50:51 --> 00:50:54: So I've been trying to address some of those questions
00:50:54 --> 00:50:58: progressively over our conversation, but if we, we will allot
00:50:58 --> 00:51:01: some time towards the clothes to to ensure that we're
00:51:01 --> 00:51:04: able to address them at least some of your questions.
00:51:04 --> 00:51:06: And Sarah, it sounded as though you had something to
00:51:06 --> 00:51:06: add.
00:51:07 --> 00:51:09: I was just going to build on what Jake was
00:51:09 --> 00:51:12: saying in terms of, you know, I think resilience we
00:51:12 --> 00:51:16: think immediately about like sea level rise and wildfires and
00:51:16 --> 00:51:17: extreme heat.
00:51:17 --> 00:51:20: But I do think the one of the biggest resilience
00:51:20 --> 00:51:24: impacts, and it is climate related, is about the intermittent
00:51:24 --> 00:51:26: and more brownouts, more blackouts.
00:51:26 --> 00:51:28: And so to me it becomes kind of this like
00:51:28 --> 00:51:31: cyclical story that for policymakers, if we can get them
00:51:31 --> 00:51:34: to understand that, you know, we all, we all understand
00:51:34 --> 00:51:37: this, we're going to electrify all the building.
00:51:37 --> 00:51:40: Electroval, the transportation, our grids getting older, the weather's getting
00:51:40 --> 00:51:41: hotter.
00:51:41 --> 00:51:43: We're trying to get to 100% renewable like it's a
00:51:43 --> 00:51:45: recipe for disaster.
00:51:45 --> 00:51:48: And we're going to have more and more of these
00:51:48 --> 00:51:50: power outages which everybody hates.
00:51:50 --> 00:51:53: And so we need to work together and and we
00:51:53 --> 00:51:56: need to make this beneficial for both the built environment
00:51:56 --> 00:51:59: can help the problem, but only if the utilities are
00:51:59 --> 00:52:01: kind of also helping us.
00:52:01 --> 00:52:02: And so I think that it's.
00:52:02 --> 00:52:05: It does create an interesting opportunity because you have this
00:52:05 --> 00:52:08: thing that's more tangible I think than the sea level
00:52:08 --> 00:52:11: rise in terms of you know people, just people do
00:52:11 --> 00:52:12: not like power outages.
00:52:12 --> 00:52:15: And I think from a building owner perspective I'm seeing
00:52:15 --> 00:52:18: more and more leases come through from tenants with like
00:52:18 --> 00:52:20: asking for built in redundancy and things like that.
00:52:20 --> 00:52:22: And it's just, it's going to be a lot and
00:52:22 --> 00:52:24: back to Jonathan's point earlier, like it's just if we

00:52:24 --> 00:52:27: have to build in just tons of extra capacity, we're
00:52:27 --> 00:52:28: defeating the purpose.
00:52:30 --> 00:52:33: And I want to sort of expand our discussion from
00:52:33 --> 00:52:36: resilience and resilience to to cybersecurity concerns.
00:52:36 --> 00:52:40: So we talked about climate resilience just now, but from
00:52:40 --> 00:52:44: a cyber perspective, right, like maybe a decade or so
00:52:44 --> 00:52:48: ago, there was a major hack from HVAC system and
00:52:48 --> 00:52:52: a target which resulted in hundreds of 1,000,000 I think
00:52:52 --> 00:52:56: of damages to to the business and to collateral damages
00:52:56 --> 00:53:00: to other financial institutions as a result of that.
00:53:00 --> 00:53:03: One HVAC system being infiltrated at A at a target
00:53:03 --> 00:53:04: store.
00:53:04 --> 00:53:06: And so I'm I'm curious as we're as we roll
00:53:06 --> 00:53:11: out these these Internet, these interconnected systems, these systems that
00:53:11 --> 00:53:13: are directly linked to the Internet.
00:53:14 --> 00:53:17: How, how do we secure those and how does that
00:53:17 --> 00:53:22: impact your ability to, you know, select specific technological solutions
00:53:22 --> 00:53:27: for for integration into building systems and then more broadly
00:53:27 --> 00:53:30: to interface between the electric grid and?
00:53:30 --> 00:53:33: And the asset and individual assets as well as you
00:53:33 --> 00:53:37: know within the private sector across the asset portfolios.
00:53:39 --> 00:53:42: Yeah, 2 Two things for me to kick it off
00:53:42 --> 00:53:42: here.
00:53:43 --> 00:53:45: First of all, definitely a major challenge and you know
00:53:45 --> 00:53:48: Energy Impact Partners invest in the energy transition.
00:53:48 --> 00:53:51: But we've recognized that cybersecurity is so key to utility
00:53:51 --> 00:53:55: operations and to decentralized energy generation that we've actually made
00:53:55 --> 00:53:59: a number number of investments really focused on cybersecurity in
00:53:59 --> 00:54:03: particular, especially those focused on operational technologies or IoT tech
00:54:03 --> 00:54:04: in particular.
00:54:05 --> 00:54:08: But besides actually thinking about cybersecurity as a category, I
00:54:08 --> 00:54:11: think it's also a limiting factor for many emerging companies
00:54:11 --> 00:54:12: looking to scale.
00:54:12 --> 00:54:14: Especially if they want to touch critical infrastructure, right?
00:54:14 --> 00:54:17: There are all these cybersecurity requirements that might block companies
00:54:17 --> 00:54:19: from getting in the door in the 1st place, might

00:54:19 --> 00:54:21: block a utility from partnering with a given company if
00:54:21 --> 00:54:23: they're not big enough or they haven't passed all the
00:54:24 --> 00:54:24: right protocols.
00:54:25 --> 00:54:26: And so the other question I have for for the
00:54:27 --> 00:54:29: operators is, is how do we rationalize some of these
00:54:29 --> 00:54:32: requirements and perhaps even create some dedicated programs to help
00:54:32 --> 00:54:35: new companies work through these processes, get some help making
00:54:35 --> 00:54:36: sure that they are being secure?
00:54:36 --> 00:54:38: I'm not trying to downplay the importance, I think it's
00:54:38 --> 00:54:40: critical, but I don't want it to delay innovation at
00:54:40 --> 00:54:40: the same time.
00:54:43 --> 00:54:47: And so just to maybe expand this discussion to you
00:54:47 --> 00:54:51: know some of the emerging technologies that we're seeing the
00:54:51 --> 00:54:53: the emergence of a I and the the use of
00:54:53 --> 00:54:57: these smart like integrated systems at the building level and
00:54:57 --> 00:55:00: at the portfolio level, how how are these sort of
00:55:00 --> 00:55:04: fitting into the bigger picture of grid interactivity?
00:55:06 --> 00:55:06: I can just say that.
00:55:06 --> 00:55:09: I mean, I think I'm going to do it earlier
00:55:09 --> 00:55:12: that when you that it's going to be very hard
00:55:12 --> 00:55:15: for humans to drive correct outcomes from the number of
00:55:15 --> 00:55:18: inputs that will be required in the future to balance
00:55:18 --> 00:55:20: the grid would be my guess.
00:55:20 --> 00:55:22: And back to the idea that if you're going to
00:55:22 --> 00:55:24: get things like real time carbon signals and real time
00:55:24 --> 00:55:26: pricing signals and all sorts of things, but you also
00:55:26 --> 00:55:28: want to keep temperature at 72 and want to do
00:55:28 --> 00:55:31: a whole bunch of other things, eventually it will be
00:55:31 --> 00:55:32: very difficult to do all of those things.
00:55:33 --> 00:55:35: That's some level of automation.
00:55:35 --> 00:55:37: And again, plenty of people respond to say, well, there's
00:55:37 --> 00:55:38: automated Dr.
00:55:38 --> 00:55:40: now when we talk about there is, But it doesn't
00:55:40 --> 00:55:43: do with all the things I just said, which is
00:55:43 --> 00:55:46: try to keep all of those different factors and parameters
00:55:46 --> 00:55:48: in mind and balance them in a way that I
00:55:49 --> 00:55:50: optimize my revenue from Dr.
00:55:50 --> 00:55:53: while keeping temperature exactly where it needs to be and
00:55:53 --> 00:55:54: doing three other things right.

00:55:54 --> 00:55:58: And so in the world where those signals become fast
00:55:58 --> 00:55:58: and furious.
00:55:58 --> 00:56:01: And again, although you can predict the wind, the wind
00:56:01 --> 00:56:04: blows harder than to do a lot of other things.
00:56:04 --> 00:56:06: And so maybe we think the wind's gonna blow and
00:56:06 --> 00:56:07: then suddenly it doesn't.
00:56:07 --> 00:56:08: And now we need power.
00:56:08 --> 00:56:11: And again, you can just see a world where things
00:56:11 --> 00:56:14: have to happen much more quickly and the number of
00:56:14 --> 00:56:18: variables need to be understood and process just goes up
00:56:18 --> 00:56:20: and and every minute is going to when you get
00:56:21 --> 00:56:22: paid or you don't get paid.
00:56:22 --> 00:56:25: So they'll be significant revenue online that you're going to
00:56:25 --> 00:56:26: need.
00:56:26 --> 00:56:28: I don't want to say A I because I think
00:56:28 --> 00:56:31: that's a catch phrase that has been a little overused.
00:56:31 --> 00:56:33: I mean sure, I'm sure A I would make it
00:56:33 --> 00:56:33: better, right.
00:56:34 --> 00:56:36: But I'm not sure that's what's needed to create this
00:56:36 --> 00:56:37: outcome.
00:56:37 --> 00:56:40: I think it's more significant increases in in, you know,
00:56:40 --> 00:56:42: frankly who cares about a I and any of this
00:56:42 --> 00:56:44: if I'm not getting paid to do it right.
00:56:44 --> 00:56:46: So the first stop, there's no utility rate structures to
00:56:46 --> 00:56:48: make any of this worth it today outside of what
00:56:48 --> 00:56:49: we talked about with Dr.
00:56:50 --> 00:56:52: But assuming the money was there, then you know we
00:56:52 --> 00:56:55: would put the right systems into place to do that.
00:56:55 --> 00:56:57: But I guess I just don't think it means a
00:56:57 --> 00:56:59: I I mean maybe down the road some this gets
00:56:59 --> 00:57:02: even more complicated than sure A I can make it
00:57:02 --> 00:57:03: a little bit better.
00:57:03 --> 00:57:06: My guess is algorithms alone would do the work just
00:57:06 --> 00:57:09: fine, it's just more putting all the pieces in place
00:57:09 --> 00:57:10: to get there.
00:57:11 --> 00:57:12: It's just one quick note there.
00:57:13 --> 00:57:14: I actually think in the short term AI might make
00:57:14 --> 00:57:15: this all more complicated.
00:57:16 --> 00:57:18: If you start thinking about the growth and power demand
00:57:18 --> 00:57:20: coming from data centers and the scale of data center
00:57:20 --> 00:57:22: growth that's that's going to continue to roll out over
00:57:22 --> 00:57:23: the next 10 years.

00:57:23 --> 00:57:26: Already in Dominion Service territory in Virginia, they've they've stopped

00:57:26 --> 00:57:27: interconnecting new data centers.

00:57:27 --> 00:57:28: And there's a couple other.

00:57:29 --> 00:57:32: Markets where you know they're just another large load that's

00:57:32 --> 00:57:35: that's competing for these same resources and the same carbon

00:57:35 --> 00:57:36: free resources.

00:57:36 --> 00:57:37: So I tend to buy the like long term AI

00:57:37 --> 00:57:40: can solve, you know, it'd be a useful part of

00:57:40 --> 00:57:41: these solutions.

00:57:41 --> 00:57:43: But I wouldn't wouldn't want to overlook the fact that

00:57:43 --> 00:57:45: in the short term they're just going to create more

00:57:45 --> 00:57:47: congestion and increase the the hurdle we've got to do

00:57:47 --> 00:57:48: to decarbonize the grid.

00:57:50 --> 00:57:51: What about it?

00:57:51 --> 00:57:51: The building, you know?

00:57:52 --> 00:57:56: I'll just make a plug at the building scale that

00:57:56 --> 00:58:00: you know machine learning is already being used in energy

00:58:00 --> 00:58:05: management and BAS systems to optimize Intune, the building systems

00:58:05 --> 00:58:06: for energy efficiency.

00:58:06 --> 00:58:09: And you know, I think we keep using the term

00:58:09 --> 00:58:12: demand response as being as an example of I guess

00:58:12 --> 00:58:16: the only value that utilities are providing right now, but.

00:58:16 --> 00:58:20: I do think that there are already, you know, energy

00:58:20 --> 00:58:24: efficiency plays that tie directly to grid and demand flexibility

00:58:24 --> 00:58:27: that are already value streams, so time of use rate

00:58:28 --> 00:58:32: structures or mitigating demand charges and things like that.

00:58:32 --> 00:58:35: So they may be part of best practices that leading

00:58:35 --> 00:58:38: firms are real estate firms are using, but I don't

00:58:38 --> 00:58:40: necessarily think it's.

00:58:41 --> 00:58:45: Widespread that everyone is using this technologies and and machine

00:58:45 --> 00:58:49: learning is available now for as a software tool for

00:58:49 --> 00:58:49: BSS.

00:58:49 --> 00:58:52: Systems, right.

00:58:52 --> 00:58:52: Well, thank you.

00:58:53 --> 00:58:56: So we are in our final minute of the of

00:58:56 --> 00:59:00: the webinar and so I'm going to just quickly go

00:59:00 --> 00:59:04: ahead and share my screen to offer you guys new

00:59:04 --> 00:59:09: attendees, specifically some assuming I can find it.

00:59:09 --> 00:59:09: There we go.

00:59:12 --> 00:59:16: Just a quick resource, so if you'd like to learn
00:59:16 --> 00:59:21: a little bit more about this forthcoming report, you can
00:59:21 --> 00:59:24: go ahead and scan this QR code or visit you
00:59:24 --> 00:59:28: alive dot America slash get smart and that link is
00:59:28 --> 00:59:29: going to.
00:59:29 --> 00:59:32: Once the report is available, it'll update and be and.
00:59:33 --> 00:59:37: You can download or or view the the report itself
00:59:37 --> 00:59:38: on Knowledge Finder.
00:59:38 --> 00:59:41: If you have any additional questions about the webinar content,
00:59:41 --> 00:59:42: you can go ahead and send me an e-mail.
00:59:42 --> 00:59:44: My emails provided below.
00:59:44 --> 00:59:44: It's fairly simple.
00:59:44 --> 00:59:48: First name, last name at uli.org and so in our
00:59:48 --> 00:59:51: final minute I want to I want to just ask
00:59:51 --> 00:59:55: those just one general question before we before we close
00:59:55 --> 00:59:56: out and that is.
00:59:57 --> 01:00:00: Could you, could you speak to how this whole grid
01:00:00 --> 01:00:04: interactivity concept is is helping you achieve the net 0
01:00:04 --> 01:00:09: imperative is is it, is it providing A substantial benefit,
01:00:09 --> 01:00:11: is it, does it have a long way to go,
01:00:11 --> 01:00:15: Are you seeing some benefits across at specific assets?
01:00:16 --> 01:00:18: And so with that I I'd just like to give
01:00:18 --> 01:00:21: you guys a chance to respond and and we'll close
01:00:21 --> 01:00:22: things out.
01:00:24 --> 01:00:27: And you can if Jonathan, if you want to begin
01:00:27 --> 01:00:29: and I can call folks progressively.
01:00:29 --> 01:00:30: Sure.
01:00:30 --> 01:00:32: I mean, I'll be very, very brief except to say
01:00:32 --> 01:00:34: that today I don't think so.
01:00:34 --> 01:00:37: I don't think great activity leads to better carbon outcomes
01:00:37 --> 01:00:38: because that's not how things are done.
01:00:38 --> 01:00:41: It's about energy efficiency and total energy consumed.
01:00:41 --> 01:00:43: I think down, obviously if I use less energy, I
01:00:43 --> 01:00:44: potentially use less carbon.
01:00:45 --> 01:00:47: So there's a link there, but I think you're going
01:00:47 --> 01:00:49: to have to get way more into Real Time carbon
01:00:49 --> 01:00:50: and a number of other things.
01:00:51 --> 01:00:53: To drive real outcomes on your net zero journey, again,
01:00:53 --> 01:00:56: if you use less energy, you're going to use less
01:00:56 --> 01:00:56: carbon.
01:00:56 --> 01:00:59: So as a general matter, energy efficiency and all the

01:00:59 --> 01:01:02: things we've been talking about it and niches highlighted are
01:01:02 --> 01:01:04: all going to get you there some of the way.
01:01:05 --> 01:01:09: But grid interactivity as it stands today is not something
01:01:09 --> 01:01:13: that is driving necessarily significant carbon reductions.
01:01:15 --> 01:01:18: And Sarah here, here.
01:01:18 --> 01:01:18: That's all.
01:01:20 --> 01:01:21: Okay, Anish.
01:01:23 --> 01:01:27: I think I'm just particularly excited about grid interactivity enabling
01:01:27 --> 01:01:29: electrification of existing buildings.
01:01:29 --> 01:01:32: So I think that's that's the value in the plug,
01:01:32 --> 01:01:34: I'll say in terms of how this can get us
01:01:34 --> 01:01:35: to net 0.
01:01:36 --> 01:01:38: And just just to to build on that and wrap,
01:01:38 --> 01:01:41: I think it's it's enabling electrification, right by better managing
01:01:41 --> 01:01:44: those peaks and then ultimately helping buy down the cost
01:01:44 --> 01:01:47: of electrification for everybody by taking advantage of the unique
01:01:47 --> 01:01:49: benefits that different parts of the energy system can capture
01:01:49 --> 01:01:50: from the same asset.
01:01:51 --> 01:01:53: So leave it in the future with Jonathan on the
01:01:53 --> 01:01:54: the challenges today.
01:01:55 --> 01:01:58: So thank you all so much for your perspectives and
01:01:58 --> 01:02:02: thank you attendees for for attending this webinar.
01:02:03 --> 01:02:06: Recording of the webinar will be available in the coming
01:02:06 --> 01:02:10: weeks and looking forward to sharing this report in the
01:02:10 --> 01:02:10: fall.
01:02:11 --> 01:02:11: Thank you.
01:02:15 --> 01:02:15: Thanks all.
01:02:20 --> 01:02:21: You got everyone.
