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 El 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

Time	Text
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.