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MIKE LIVERMORE: Welcome to the *Free Range* podcast. I'm your host, Mike Livermore. This episode is sponsored by the Program on Law, Communities, and the Environment, at the University of Virginia School of Law. With me today is Katherine Blunt, a journalist at the Wall Street Journal and the author of the recently published, *California Burning: The Fall of Pacific Gas and Electric and What it Means for America's Power Grid*. Hi, Katherine. Thanks for joining us today.

KATHERINE BLUNT: Thanks so much for having me.

MIKE LIVERMORE: So unfortunately, the subject of wildfires in California does not seem like it's ever going to get stale, at least any time soon. As we're recording, I guess the mosquito fire is burning near communities in the Tahoe and Eldorado National Forest. The book, *California Burning*, it's really a fascinating deep dive into the history of the utility PG&E and its problems.

But before we get into the story and the content of the book, I was just curious as someone that's been observing, and thinking, and writing about this for a while, whether you had any hope that, in our lifetimes the wildfire risk in California will be well managed enough that it fades into the background rather than being such an omnipresence in people's lives.

KATHERINE BLUNT: Unfortunately, I think at this juncture it's really hard to say. A big factor, one of many that I'm sure we'll explore in this conversation, is that, a lot of this risk has been exacerbated by climate change and the very severe drought periods that we've seen, which just makes this all the more difficult to manage and all the more difficult to predict. And so I think that there's a lot of very smart minds working on this issue. But at least in the foreseeable future, it's hard to really anticipate that it will be minimized in a major way to the point where it actually fades into the background.

MIKE LIVERMORE: Well, that [? tarot ?] prediction, maybe we could talk about how we got to where we are today. So this, the book, is about a utility, which, for the casual reader, it might not sound like an obvious topic for a page turner, but really, corporations may not be people, but they're full of people. And there's just an absolutely huge fascinating cast of characters in the book. There are CEOs. There are peoples whose homes and lives have been destroyed by fires. There's cops. There's prosecutors.

And one of the questions I was just curious about is-- you spent a lot of time with these folks with a lot of documents and a lot of proceedings, again, reporting and doing research for this book over the past several years. Who did you end up identifying with or finding some common perspective with over the course of meeting all these different folks?

KATHERINE BLUNT: Yeah. I really enjoyed everyone who I spoke to for the book, speaking to for different reasons. They all brought very different perspectives. One question-- you said just a few minutes ago, corporations aren't people, but they're full of people, which is true. And of course, in the eyes of the law, though, they are people and can be prosecuted as such. And twice now, this company has been convicted on criminal charges of neglecting the safety of its infrastructure.

And there were a few individuals, in particular, the prosecutors who investigated the deadliest wildfire in California history as well as a former San Bruno police officer who's helped investigate a deadly pipeline explosion-- talking to these people and getting a better understanding of the investigations that they conducted really, I think, helped me explore this idea of corporate liability and what it means to convict a company of these charges.

Corporate liability, it's not really an intuitive idea. Lot of people fail to understand how you can convict a corporation without pressing charges against any individuals. And I think it's really important to understand that. And I really enjoyed those conversations for that reason.

MIKE LIVERMORE: Yeah, it's a fascinating topic, actually. And this is-- of course, a major part of the framing of the book is around these criminal investigations and these criminal charges. And maybe we could dive into that because I'm interested in this as well, and I'd be interested in your thoughts. However, maybe just as a bit of framing, what are the core criminal charges that you end up following at least through part of the book?

KATHERINE BLUNT: Right. So the first major incident occurred in 2010 when a gas transmission pipeline exploded in San Bruno, which is a small community, a few minutes South of San Francisco. The explosion destroyed a neighborhood. It killed eight people. A lot more people were injured. And it resulted in a very long and detailed federal investigation into how PG&E was managing its gas transmission system, and ultimately resulted in the company going to trial over charges of violating the Federal Pipeline Safety Act.

And the company fought very hard, which is, of course, really uncommon. You rarely see these kinds of things go to trial. But ultimately, it was convicted on six counts-- six charges, five of which were violating the Pipeline Safety Act, and the other one was obstructing the National Transportation Safety Board's investigation of the explosion. Really, really fascinating trial. A really great lens through which to understand this really weird idea of corporate liability and what that meant in this case.

The other charges were just-- I mean, frankly, it was an unprecedented situation in which, in 2018, an electric transmission line failed, ignited the most destructive and deadliest fire in California history, in which 84 people died. The prosecutors in the County in which it occurred did a really, really amazing investigation into exactly what happened, and ultimately indicted the company on-- a grand jury indicted the company on 84 counts of involuntary manslaughter.

PG&E has been one of the few corporations to face homicide charges historically. And the company agreed to plead guilty. So that's where we stand now.

MIKE LIVERMORE: Yeah. So these are the two-- I mean, they're really, as you said, unprecedented, fascinating cases. And the underlying events are just incredibly tragic. One of the senses that I think-- at least I felt, at the end of it was, there's some dissatisfaction. You have these prosecutions, they're actually ultimately successful. You have a trial in San Bruno case. You have a guilty plea in the wildfire case.

And that's a successful resolution from the prosecutor's perspective, but no one goes to jail. It's just something very different when a corporation is on the other side of it. So I was just curious if that impression was accurate, in the sense that folks felt a little-- there's something a little deflationary in the sense about the ultimate wrap up even of a successful prosecution.

KATHERINE

Yeah, absolutely. So on the one hand, you look at both of these investigations and the successful prosecution, it's amazing in that-- it's very difficult to convict a corporation. And of course, after these disasters everyone asks, who's at fault? Who's to blame for what happened? And when you consider an organization like a utility with so many people making decisions, very diffuse hierarchy and decision-making processes, legally speaking, it is really difficult to assign blame.

BLUNT:

And even outside, I mean, this legal context is very difficult to assign blame. And you really see this-- I mean, it's what it is. I mean, PG&E is a story of systemic breakdown. And so that with that in mind, it's really amazing that these prosecutions were successful as they were. But it also speaks to the fact that-- in the eyes of many, it's just a really unsatisfying outcome to have charges pressed against the corporation itself because it feels as though, I think-- there's just so many questions of accountability. What's the best way to hold a company and the people within it accountable?

And also, with the resolution of these cases, the Penal Code is written to penalize individual people. Ultimately, the company ended up paying almost nothing relative to its overall size in fines for these crimes. And many people felt that was really ineffectual in terms of punishment. In the case of San Bruno, actually, it was interesting. The company was placed on corporate probationary period in which the chief requirement was no more crimes, which, of course, they ultimately ended up being convicted on 84 counts of involuntary manslaughter during this period.

So that didn't work out especially well. And I think the judge overseeing that case really was-- he felt, I think, at the end of the day, really hamstrung in his ability to enforce compliance and to make that probationary period effective. So I think you're right, there's a lot of frustration. And it's such an interesting subject as to-- and it raises great questions of accountability and how you pursue resolution after these sorts of disasters.

MIKE

LIVERMORE:

Yeah, it really is. I mean, you're just kind of thinking about-- so when I think of the criminal law as opposed to other areas of regulatory law, or whatever, one of the big differences is that, we use the criminal law as a way of condemning, morally condemning, behavior, that we reserve or we often reserve the criminal law for types of behavior that we think is fundamentally morally wrong, and we want to and we want to kind of show society's judgment about that.

And we actually-- criminal law is integrated with lots of regulatory programs. In the environmental context, if you say falsify documents and submit it to the government, you're personally criminally liable for that kind of thing. But here we're not talking about that charge. It's not that someone falsified a document or engaged in some particular criminal act that they're held liable for. It's that, as you said, there was a systemic breakdown, or at least let's just say the system, that is the company, interacting with its environment produce this result, which is that, 80 people died, or 84 people died.

And it is tricky because in a sense-- I mean, again, as someone who's as familiar as anybody is with the details of the cases, what's your sense of the moral culpability of the individual actors? And can we separate out something that's distinctively a distinct moral culpability of the collection of how they're interacting with each other in this structure that's distinct from the moral culpability of the individuals involved?

**KATHERINE
BLUNT:**

Yeah. I mean, that's a really great question. One of the more difficult ideas in writing this I felt was the collective nature of the charges that we're talking about. So the prosecution following the San Bruno explosion-- these charges were predicated on this idea of collective knowledge and collective intent. And I'm sure many listeners know, I mean, that's just a very complicated area of the law. And because there's this idea that, corporation acts, through its employees, historically speaking, charges can be brought against the company if one person is criminally liable for a certain set of actions.

But it starts to get a lot more complicated when you have these very complicated corporate structures in which a lot of people are acting in a lot of different ways with a lot of different types of knowledge. And the best way I could sum it up was-- and this is probably still, to some degree, imprecise because it is so complicated, but rather, a lot of different individuals within the company knew that there were some things that were going wrong, that they weren't doing exactly what they were supposed to do, and threw through their interactions with each other ultimately, ignored these risks and problems or made them worse.

But nobody acted with such specific criminal intent that it was appropriate to bring the charges against that individual. And so in even just listening to the testimony of some of these engineers during the San Bruno trial, I mean, it doesn't appear as you're talking through the complexity of the issues that they were acting with true immorality. To answer your question, it seems as though they knew that something was going wrong, but they didn't realize the extent of the consequences of their decisions. Unfortunately, it was brought into incredibly sharp relief after the explosion.

And it was interesting too. And the defense really argued for a very strict definition of intent. Somebody had to have acted with an evil meaning mind with the knowledge that his or her conduct was unlawful. Ultimately, the judge in the case said, no, in this case intent is defined as willful disregard for the regulations that were in place. And that's a much lower bar to clear from a prosecutorial standpoint.

So it's a really good question, and it's just one that-- I just found it to be so interesting to sit with and understand that, when you have the indictment and ultimate conviction of a company like this, it's not necessarily a very strong indictment of the individuals within the company, if that makes any sense.

**MIKE
LIVERMORE:**

Yeah. Well, certainly there's going to be a lot of people who are just unrelated in some sense to what went on. And there's another-- it just occurred to me, it's not clear why we draw the boundaries that the corporation, I mean, there's legal reasons for that, but it's from a moral perspective. And if we're trying a little, we want the law, to some, sense match our goals with respect to moral condemnation. Because the company is enmeshed in a structure, that includes the regulators, and includes politicians, and includes investors, and includes customers who put pressure on the company in different ways.

And so there is something, in a sense, peculiar about selecting this collection of people, which is the corporation, and vis a vis their relationship, really, to this entity. But even though, really, there's something artificial about that boundary, there's lots of people in the company who we would just say are completely unrelated to the bad acts. And there's lots of people outside the company who are integral to the outcomes that we're seeing there. And so that's another peculiarity. And I don't if that was something that, presumably, the prosecutors didn't contemplate going after the regulators as a responsible party.

KATHERINE BLUNT: No, that's a really great point, and I never quite thought about it that way. But I mean, you're right, it is, in some ways, arbitrary when you're considering a company like PG&E. And so pursuing charges against the corporate entity-- yeah, I guess in some ways it does make sense because you are examining the decisions of the people who are most responsible for the conduct of the company. But it is true that the company is subject is supposed to be subject to strict regulatory oversight.

And in the case of the San Bruno disaster, the National Transportation Safety Board was very hard on the California Public Utilities Commission and spelling out its many failures in effectively overseeing this company in the run up to the explosion. So there's real culpability there. I never quite considered it in the criminal context because that was outside the scope of the investigation, but it's a very good point that you raise.

MIKE LIVERMORE: Yeah. And there's another tricky part of this, especially towards the end of the book. I won't give away the details, but there are-- well, we just explained that we have these guilty verdicts and these pleas. And there's the problem of punishment, especially in the case of PG&E, which-- actually, I don't have the timeline exactly straight in my head, but there's a simultaneous bankruptcy proceeding, basically.

So if you haven't, you've-- equity investors have already-- not maybe fully been wiped out, actually, they were quite well protected in the bankruptcy proceeding. That's something else that's in a very interesting element of the book. But ultimately, when you impose costs on an entity like PG&E, there's only so many places it can flow to. It can flow to equity holders. It can flow to creditors in the case of-- if you're going to write down some debt. And really, a lot of it's going to flow to the customers in the long run, or maybe to taxpayers if there's some taxpayer bailout.

So there's this other issue where, not only is it hard to identify the responsibility, but whatever punishment you put on the company is going to get passed along to lots of different diffuse actors. And I was really struck. In particular, there was-- I'm now I'm forgetting the term, but this idea that now the company might be on notice, that its actions are potentially harmful in the future, could even see a murder charge.

And what struck me then was, who's going to want to work at a place where you could literally be put in jail for murder based on your decisions? You're going to have to pay people so much money to do that. And then that means that someone's going to have to pay for that, probably customers. So I was curious of your thoughts about that too, just the complexity, and difficulty, and dilemma of actually punishing the actors involved.

KATHERINE BLUNT: Yeah. So there's a couple of interesting points there to unpack. I mean, the bankruptcy-- so PG&E [? is ?] [? in ?] bankruptcy protection in 2019 after a series of deadly and destructive wildfires that occurred in both 2017 and 2018. It faced an estimated \$30 billion in liability costs. And so it used the Chapter 11 process to through all that. It was an enormously complex bankruptcy. To your point, yes, the shareholders, in an unusual set of circumstances, were very well protected, interestingly.

And they really fought for a plan that wouldn't require raising huge amount of equity, therefore better protecting the value of their holdings there. And how that ultimately shook out for individual fire victims and businesses who lost lots of property, loved ones, in these disasters is that, the company funded a settlement trust for them that was supposed to be valued at \$13.5 billion. But at this point, because of various settlements with other financial parties, it didn't have enough cash to-- it didn't have \$13.5 billion in cash. So it funded the trust with half cash and half shares in the company itself.

So that's significant in that, the compensation for the individual victims is tied to the future stock price of the company. And a lot of different types of penalty is half the potential to weigh on the company's share price.

MIKE Right. Right.

LIVERMORE:

KATHERINE So I mean, that introduces a whole unusual layer of complexity that's really, of course, at its core, very sad.

BLUNT: There's a lot of frustration within the fire victim community naturally that this is how it shook out for them. Whereas other major parties, including hedge funds and insurance companies that are in the risk business, so to speak, were able to reach all cash settlements. They carried no risk. So there's that. I mean, that's interesting to consider.

And to your point about the potential murder charges, I found this to be very interesting. So the company was convicted on involuntary manslaughter charges. I mean, that was predicated on the idea of reckless negligence, not specific intent to kill. The prosecutors--

MIKE Just to give an analogy for folks, in the law we do this all the time. There's murder, which is, you intend to kill someone. But you could be acting with reckless disregard for them. And the goal isn't to kill someone, you're doing something else, but you're just so unconcerned with the consequences for other people that we find that morally blameworthy, and we penalize that under the criminal law.

KATHERINE Right. So then in California, and probably other places, but there's a specific California precedent in which there was a man who was ultimately convicted on second degree murder charges for killing a couple of people while he was driving under the influence. And he had done this before. He had been convicted on DUI charges previously. And so the prosecutors argued that that amount-- the knowledge that his behavior was so risky-- I mean, he was putting other people in danger.

The fact that he'd been convicted on these charges previously was enough to have that implied intent that's needed to convict someone on a second degree murder charge. The idea that your behavior is so risky and yet you're still engaging in it. And so that was the idea that the prosecutors put forward after convicting the company on these involuntary manslaughter charges.

They said, well, this is the second time you've been convicted on charges of, basically, recklessly operating some area of your system with deadly consequences. That should be enough. Next time it could be second degree murder. I mean, I'm sure that if you were to really delve into this from a legal standpoint, it gets much more complicated than that, but it's simple enough. And I thought it was really representative of the consequences here and what could come down the pike.

And to your point, yeah, I mean, how do you recruit and retain talent if this company is really unable to get a handle on these kinds of risks, or slips back into the-- it's a slow drift, but drifts back into this reckless pattern of behavior that's resulted in these past failures. The risk of that is not zero, unfortunately, as we've seen.

MIKE And CEOs, it can be hard to sympathize with. But you can imagine coming into a company, it's huge. I mean, I don't how many employees PG&E has, but it's in the many thousands. And it's unbelievably complex. There's no one who has the system in his or her brain. It's just impossible. Your brain can't store that much information. And you can pound your fist on the table as much as you want, and you can fire people, you can hire people. You only have so many levers, though, ultimately.

In a sense, this is the problem of diffuse responsibility. It's that, something builds, up and you can make any one person, just as we might not find the intent in any one person, it's the collective. It's actually very hard for any one person or even a handful of people with very good intentions, and even a lot of skill and talent, to actually effectuate change in such a complex system.

**KATHERINE
BLUNT:**

That's definitely true. Yeah, absolutely. And I think that's certainly a frustration that many people at different levels of the company have had for a long time. So I mean, historically speaking, of course, the company has employed very smart people with good intentions. And I think see even more of that now with people who are attracted to trying to solve this problem in a meaningful way. But I mean, the diffusion of responsibility is a huge issue. I mean, the sheer size of the company is a big challenge there.

It does employ thousands of people. The service territory covers 70,000 square miles. You've got inherent risk. You you've got old power lines running through, parched forests filled with millions of dead trees. And the consequence of a single spark is considerably higher than it was even 10 years ago. And another key element of this story that I think is really crucial to understand is, PG&E is a weird company, and that it is a publicly traded corporation that's beholden to shareholders. It's also a regulated monopoly subject to stringent oversight of its spending and of the safety of its system in an ideal world.

And so the way this company makes money is to make large capital investments in the system, the types of investments that boost the overall value. It earns an authorized rate of return on those investments, building new power lines, substantially overhauling substations, things like that. Doesn't make money on day-to-day operations and maintenance expenses, which means it doesn't make money on doing inspections. It doesn't make money on doing little tiny replacements of power line hardware that has the potential to fail.

And this is the case for every so-called investor-owned utility. Theoretically, companies can strike this balance. But there was a great session held at the California Public Utilities Commission at some point after some of these disasters in which an organizational behavior expert came in and just offered a really simple example for the regulators as to how this slowly starts to break down over time. You've got a manager who's in charge of the capital spending budget and the expense budget. And if he spends \$1 on capital, he gets \$1.20 back. If he spends \$1 on maintenance, it's just \$1 out the door.

Nothing happens. There's no reward. And so if they \$0.80 on expenses, all of a sudden, there's a \$1.20 to invest in capital with the prospect of a larger return. And the immediate consequence of cutting that dime out of the expense budget-- there's no immediate consequence, nothing happens. And so this drift just happened slowly over time, and then all of a sudden, as these tiny decisions accrue and the risks associated with them accrue, all of a sudden, there's a disaster.

And that's what it takes to wake people up internally to the consequences of those actions, but only then. And that's a really scary thing. And so the prospect of the drift is real, and I think it's very hard to catch as it's occurring. So it's one of those things in which-- it's just a very sobering thing to think about. It's so mundane until it's not.

MIKE
LIVERMORE: Yeah. Let's get into the weeds of this because I mean, if there is a policy recommendation that one could kind of read off, maybe we could think about addressing that. But let me make sure that I'm getting this clear because it is utility, as you'd well know, regulation is an unbelievably complicated thing, but just in broad outlines. So as you said, we have an investor owned utility. We have a regulator that approves prices and investments and other things.

And just with respect to this capital versus [? O&M ?] operations and maintenance-- so on the capital side, utilities go to the regulator and they say, look, we want to make this capital investment of X number of billions of in order to-- depending on what stage of the deregulatory process, but let's just say to upgrade our lines, capital investment, upgrade our lines, build a new power plant, whatever. And then the regulator says, OK, do we need that? Do we not need that?

If we think do need that, then fine, you can go ahead and we'll let you will approve that spending and you can make that money back with a rate of return on that investment. And that's the capital side. On the O&M side, just to make sure that I'm clear about this, these guys have O&M budgets that are essentially approved by the regulators, right. And then the costs of O&M are ultimately recouped from customers in terms of prices. Otherwise, I mean, someone's got to pay for that. O&M is coming from somewhere. And presumably, that somewhere is customers.

KATHERINE
BLUNT: Oh, that's exactly right. So actually, I mean, all of this is recouped through customers ultimately, both the capital as well as the expenses. And specifically, on the capital side, they collect even more in the form of the rate of return that's approved by the regulator.

MIKE
LIVERMORE: Right. So then I guess the question that immediately comes to mind is, why don't they just ask for-- if the problem is, they're not spending enough on O&M, they could ask for more. They ask the regular regulator to approve a greater own budget. So in a sense-- again, this is an impression so you'll tell me if I'm wrong about this, but it seems that what is really happening here in some way is that, you have a fixed amount of political capital before the regulator.

You're going to go to the regulator and you're going to ask for them to approve different things. And when they approve your O&M budget, that's nothing to you. That's money in, money out. It's basically of no value to you as a company other than, your system doesn't burn down, you're not going to be liable for things. But putting that aside, you don't make money on that. On the other hand, when the regulator approves the capital expense, you do make your rate of return on that.

And so if you have a fixed amount of political capital before the regulator, there's going to be this tendency to say, OK, yeah, we'll reduce on O&M. We're not going to put really big O&M and budgets before the regulator the customers have to pay for. Instead, let's go for these big capital projects, that's a place where we can make some money.

KATHERINE Yeah. And I think, in terms of the regulatory process, that sounds right. That pretty well captures the dynamic.
BLUNT: But I think that what happens then is, OK, so the capital budget is approved by the regulator. The expense budget is approved by the regulator. But then you have the actual task of the manager who's overseeing the budget and how this money ultimately gets spent. I think the point that this expert was trying to make was that, so OK, you have these two budgets that had received regulatory approval. And it's ultimately up to the company to determine how it spends that money.

And so then if you just take a little bit out of that expense budget, a little bit less than you told the regulator that you were going to spend, and instead, shift that over into some capital investment, the motive there is that, you have that immediate return, that immediate reward, for doing that [? at ?] no immediate consequence. And it's impossible for the regulator to very closely oversee exactly how the companies are spending the money that they've been approved to recoup through customers.

And there was a really interesting example that came out during the San Bruno trial that-- there was an auditor who came in after the explosion to look at how the company had been spending money over the course of about a decade. And they found that the company had consistently underspent, spent less than it told regulators it would spend on O&M, specifically on gas transmission, that there was very significant expense pressure during certain years. And that the company had actually overturned its rate of return by shifting some of that money into the capital budget.

So it just goes to show that this can slowly break down over time in part because of this really challenging set of incentives that people are dealing with, and because of the lack of disincentive to shift money out of the expense budget because, once again, the consequences are not immediate. And so the scary part of it is, the consequences are not immediate until the consequences are catastrophic.

MIKE
LIVERMORE: Right. Right. And it's tricky because on the other hand, you wouldn't want the company to make a rate of return on its-- I would assume we wouldn't want the company make a greater return on its O&M budget because then it would just start spending money crazy. That would be the whole thing, it's that they would want to spend, spend, spend, spend. And so there's this back and forth. And maybe this allows us to expand out a little bit, probably talk about the relationship between capital and operations budget forever.

But this is a part of a broader point, I think, even, which is-- an impression that I got towards the end of the book is-- I was asking myself whether PG&E going forward, putting aside how it got here, just faces-- is it an actually impossible task that we've charged this company with doing or delivering safe, reliable, affordable, and clean energy, as we define those terms that something's got to give somewhere. And-- I don't know, that was just a sense that I had, that there was literally-- that it was just impossible to actually deliver on what the charge of the company is at this time.

KATHERINE
BLUNT: I mean, it's the key question in the book. And I know it leaves people with this sense of despair, that there's no great solution. I mean, there are many things, I think, that can improve the circumstances. But something that's sort of unfortunate and really difficult to sit with is, at the end of the day, it's next to impossible for this company to bring the risk to zero, given what it's dealing with. And there's all kinds of conversations that sparks-- a lot of people ask, would a different ownership structure would be better if the profit motive was eliminated?

And there's a whole long conversation to be had about the benefits of some-- whether it's state ownership, or some other public ownership, or customer ownership in the form of a cooperative, but I mean, that still doesn't change the fact that you have these power lines running through these forests. You have the inherent risk of failure of some kind, whether that be mechanical failure or a tree branch getting lifted in periods of high wind and getting tangled in a live wire.

It doesn't change the fact that the company, under any ownership model, would be liable for these damages resulting from these fires which are becoming more destructive for a number of reasons. And so there's been a few solutions that the company has been trying to implement lately. One, and something that's, I think, going to be happening on a fairly regular basis for the next number of years, at least, is that, it preemptively turns off power during periods of high risk.

So if the winds pick up and it makes the likelihood of failure of some kind more likely, they will turn off the power to any number of customers in the risky areas. The idea being, OK, if the line isn't energized, it can ignite a fire. So the delivery system that becomes safe, but not reliable. Historically, we've counted on these companies to deliver safe and reliable power, that's been the expectation that started to break down for this company. It can't do that all the time.

And I think that this preemptive shut off situation certainly lowers the risk of ignitions, but it doesn't, to me, seem to be sustainable from a customer standpoint in our collective expectations for PG&E and other utilities. Now the new CEO has proposed burying 10,000 miles of power lines in risky areas because if they are underground, they cannot start a fire. And it's interesting because lately, I've gotten a few questions being like, well, that's hugely expensive, which it is. They're estimating \$20 billion, and that might be a conservative estimate.

Someone says, why don't they just insulate all these wires? Why don't they just put what's called tree wires, so that if a branch hits it, it won't ignite a fire? And I would imagine, probably, that the insulation work would be treated as an expense, less so a capital investment. And their argument is, this is-- I mean, the undergrounding plan is a big capital investment on which they will earn a return. And do they really need to spend that much money and do it that way?

Maybe it's the thing that threads the needle on this. I mean, you make some money for shareholders while also making the system substantially safer-- I don't know. It's an interesting question for the regulator. But at the end of the day, even after all of this, there is some inherent risk. And I think that some of the-- I mean, all of these ideas will help, but it's definitely a tough-- the company is definitely in a tough position for a lot of different reasons.

**MIKE
LIVERMORE:**

Right. And then the other piece of that is, safe, reliable, and affordable. Certainly, the burying lines, but also almost whatever you do, including cutting down billions of trees or redoing the wires, whatever it is it's going to cost money. And so there's this trade off. And that money is going to be recouped [? up, ?] either by consumers, or potentially by taxpayers if there's some kind of bailout. I mean, even if you wipe out the share price, which, as you noted earlier, a chunk of which is held by victims of earlier disasters.

And so that's the other piece of it-- is that you want to do this in some relatively cost effective manner because it's being borne by someone somewhere, these costs are being borne by someone somewhere.

KATHERINE BLUNT: Yeah, exactly. I mean, that's a great point, safe, reliable, and affordable. And I mean, one huge practical challenge of burying all these power lines is that, it is expensive. And I mean, already, rates in California are very high. And of course, we're in an environment currently in which it's costing more to produce electricity because natural gas prices are higher, and likely will remain higher for some time now. Just general inflationary environment.

So managing those costs and determining how much customers can and should be expected to pay is going to be a really tough question. I think that to some degree, this is reflective of a reality in which it is expensive to safely deliver electricity in California. But that becomes a harder pill to swallow when you're talking about PG&E because some of this is a result of its past mistakes. And that's tough. And so there's some mechanisms that can be used to lessen the burden over time.

I'm curious if there could be some mode of securitization or something like that as it relates to these costs, but it remains to be seen.

MIKE LIVERMORE: Yeah. Maybe we could just shift gears just a little bit to talk about renewable energy, which plays a role in the book as well. Because that's part of the mix these days. It's not just safe, reliable, and affordable, but ideally, it would be clean and wouldn't be contributing to environmental risks, including local environmental risk. But obviously, these days we worry a lot about climate change. So what role does renewable energy play in this story that you're telling us about, PG&E's development over the last couple of decades?

KATHERINE BLUNT: Yeah, absolutely. So around the time, the company emerged from-- so the company has sought bankruptcy twice in the last 20 years. The first time was after the California energy crisis of 2001. And around the time that it emerged, there's a big shift underway in California in that, the state legislature is beginning to set very ambitious targets for carbon reduction. And part of that required the utilities to go out and contract for a lot of new wind and solar capacity.

And wind and solar are some of the cheapest forms of power generation now. But back when these goals got underway, they were not. And it was it's so happened that over the course of 5, 10 years, the companies, they contracted for a lot of wind and solar power at prices well above what we see today. So these contracts are ultimately were expensive, these long term contracts. And those are treated as expenses that's passed through to customers.

So it created both rate pressure as well as expense pressure, which, of course, those things are related. But it was ironically one of those things that added to the expense pressure within the company to minimize certain costs. Some of that involved inspection and maintenance costs. So the early investment in climate change mitigation made it so that it was harder for the company to ultimately manage its infrastructure as climate change seriously changed the risk profile of its service territory. So there's some irony there.

And California's early investments in these forms of generation when in solar, I mean, it really helped drive down the costs. It helped create the economies of scale that we see today that has made it so that these forms of energy are quite affordable, relatively speaking. But the companies were paying huge billions and billions of for this power, and it created unforeseen challenges.

MIKE
LIVERMORE: Yeah. This is really a great example, a sad example, of the mitigation adaptation problem, in some sense, dilemma. Because when you undertake efforts, as you know to reduce greenhouse gas emissions, the benefits of that are very, very diffuse. They're diffuse over time, many decades, hundreds of years sometimes. And they're diffuse over the whole planet, right. When California reduces its greenhouse gas emissions, that benefits people in Pakistan, and China, and Europe, just as much as it does people in California.

And as you noted, California created this positive externality broadly, understood a technology externality where it created a market for technologies that we really need and the rest of the world really needs. And other states in other countries have been able to take advantage of the lower costs of these technologies just in the same way that the US subsidizes drug development for the rest of the world. Because we pay very high prices for prescription drugs that then is what makes it possible to develop those drugs, and then you can make generics that everyone else uses, or just lower prices that get negotiated.

So how do you end up feeling about that as someone that's in California? Should California feel good in some sense that it created these benefits, or it was being a responsible actor at a time when lots of others weren't being responsible actors about clean energy, but now it's, in some sense, footing the bill in a very real way, both in terms of rates and in terms of trade offs that are being made between risks that could be reduced but they'd be very expensive, and electricity rates are already very expensive? And so yeah, how should people in California feel about how this has all played out over the last couple of decades?

KATHERINE
BLUNT: Yeah. I mean, I think that-- well, I mean, California's contribution to, exactly how you spelled it out, contribution to developing the economies of scale, contribution to the idea of reducing carbon emissions, I mean, to some extent, it is a point of pride and rightfully so. But I think that it's been interesting to consider what this has meant.

So not only were these early contracts expensive, and not only did that create rate and expense pressures within PG&E, but in terms of the role that the regulator played, it was the California Public Utilities Commission that was tasked with overseeing the procurement of these contracts. And that really became the regulator's focus at a very critical time. If you worked within the regulator, you wanted to be within that policy division. That was the place that had the most cachet.

Frankly, it was just the sexier place to be relative to the safety division, which, certainly, prior to the deadly fires of '17 and '18, was understaffed and underfunded. It just couldn't really compete with the other division for those resources. And as a result, these regulators had a great deal of challenge having good oversight into what was happening within PG&E. And on top of that, there was also, on both sides within PG&E as well as within the regulator, I mean, a real underestimation of the risk, fire risk, in Northern California.

Even as early signs were emerging that things were getting a lot drier and a lot more flammable, both PG&E and the regulator mutually agreed that PG&E shouldn't have to do as much to address fire risk as its counterparts in the South because wildfires have historically been more of a problem in Southern California. Now we're beginning to see the relationship between what's happened in the past and what's going to happen in the future break down as climate change creates different sorts of patterns.

And I think that it certainly speaks to the fact that this was difficult to foresee. Even as signs were emerging, I don't think it would necessarily have been easy to understand this. I mean, we have the benefit of hindsight now. But I think it just speaks to the fact that there needs to be, for PG&E and for all utilities and those tasked with overseeing them, a different mode of risk assessment, less of a reliance on what's happened in the past as a lot of utilities and regulators use backward looking models to try to anticipate what's going to happen in the future.

And it's no longer as appropriate as it once was. And that doesn't directly answer your question as to how should Californians feel about all of this, but I think that, for a long time now, California has been a place in which you really do acutely see the consequences of climate change, and you're beginning to see it elsewhere in the country as well. I think there's just a broader lesson to be learned here. It's hard to answer how we should feel about it, but there's some good here, but there's also a real cautionary tale.

**MIKE
LIVERMORE:** Yeah. There's a real cost, I mean, that California is incurred to be a leader on this stuff. So speaking of the elsewhere in the country-- obviously, the book is very centered on California. Occasionally, we go to Michigan to pick up a CEO. But for the most part, we're talking about California. But there are going to be lessons here, right. So I guess the question is, how much of this is-- is it California story or an arid West story? Or is this a national story or a global story? What are the blowing-- zooming out from California, what do you see folks elsewhere as learning from this history?

**KATHERINE
BLUNT:** Right. So I mean, it is very clearly, of course, a California story and an arid West story. I mean, that makes a lot of sense. But I think it's important to just think about the more severe weather patterns and weather events we've seen over the last couple of years. Not in every case, but in many cases, scientists say that the severity of the event had a climate signature. I mean, it would have happened regardless, but was made more severe by our changing and warming climate.

And I think that really speaks to the fact that, utility is everywhere. We're going to have to confront new risks as a result of this. And I think PG&E's story demonstrates that, if any company has a history of mismanaging spending or mismanaging risk, it is going to be much more challenging to get ahead of things as these risks begin to emerge and potentially in quite unpredictable ways, or difficult to predict ways, I should say?

And the consequences of the failure of the electric system are becoming greater. I mean, certainly, whether it's-- in a very acute sense, if it's in the West, where we see greater risk of fire, but even on the East Coast, if you have a very severe storm that knocks out power for multiple days, as we've seen, of course, also with PG&E story, when the power is out for a number of days, it has huge economic consequences. It has health consequences.

We are becoming increasingly reliant on electricity. I mean, we already are very reliant on it, of course, but we're also trying to add a lot of electric vehicles to the system. We're trying to do more to phase out natural gas. And to be without power for any stretch of time, it's untenable for a number of reasons. And then on top of all this, it's important to remember too that the grid, everywhere, is very old, it's becoming more prone to failure. So when you layer on this additional risk, it's a lot to manage. And I think that there's lessons for every region of the country.

MIKE LIVERMORE: Yeah. So I actually want to go in two directions. One is a little micro, one is a little bigger picture. So let me ask my zoomed in question first. Your response there-- that legacy mismanagement or legacy bad risk management practices are going to start to really show. I guess my question there is-- because the book is very much about PG&E. And there are other utilities there. As you mentioned, there's wildfire risk in Southern California. There are other utilities discussed in the book to a certain extent.

How bad-- and this is difficult because you've been focused on PG&E, but you have some familiarity with the industry more generally. How bad was PG&E's risk management practices and the way that they maintain their system compared to-- let's just stick within California, the other utilities in California? Is this just something where PG&E was mismanaged, and it's really internal to the corporate culture or the individuals involved, or is it something that's really more widespread throughout the industry?

KATHERINE BLUNT: Yeah. I think there's-- it's a tough question to answer. So I think that-- well, for one, I think maybe just to start, to set the stage-- I mean, we were talking earlier about the inherent tension within the investor and utility model between private interests in the form of satisfying shareholders and the public good in terms of safety operations and maintenance expenses and making sure that's done properly. That tension is inherent within every utility company.

And I think that PG&E is hardly the only utility that has mismanaged that for various reasons over the years. It just so happened that the consequences of PG&E's mismanagement were so incredibly great, and greater than what we've seen elsewhere in many respects. And I think you're also beginning to see that change, of course, as the consequences of failure become higher. But to answer your question about comparison to the utilities in Southern California, there was a major fire in 2007 ignited by a San Diego Gas and Electric power line.

And it was a wake up call for that company in the same way that the 2017 and 2018 fires is a wake up for PG&E. But it was also a wake up for the regulator. And the regulator ultimately required those utilities to do more to address fire risk, didn't ultimately end up requiring the same of PG&E. But I think all of this speaks to the fact that-- I should add that, also, as a result of an investigation, it turns out that San Diego Gas and Electric had been, to some extent, mismanaging the risk prior to 2007.

I haven't delved super deeply into what exactly that looked like, but it speaks to the fact that it takes these disasters to reveal some mismanagement or some other systemic problem, like poor records or something like that. And I think-- I mean, [? it tries ?] as to simply answer the question, it appears to me that PG&E's mismanagement has been more acute than what you might see in other utilities historically. And certainly, the consequences of it have been greater. But I think to some extent, this does occur within every company.

And it's not for necessarily nefarious reasons. It could be, frankly, for what might be considered-- I don't if benign is the right word, but there might not be any ill intent, but there is some level of systemic breakdown within different divisions within these companies, I'm sure of it. And so this is a challenge for every company.

MIKE LIVERMORE: So maybe my last question for you will be-- again, more of a big picture question, is this model just broken at this point, especially as we face these increasing risks and changes from climate change? There's almost an ossification that is part of the story here, where you have these incumbent actors. They've been around a long time. They've accrued these cultures and are incredibly difficult to change. They've incurred just liabilities, in terms of these old infrastructure, these old power lines, these old gas lines.

And maybe we should really just be thinking very differently about distributed energy, storage, unwinding the relationship between electricity generation, production, and storage, to the extent that we have any with these big legacy actors, and we should be thinking in a decentralized way. Now that's very different from an alternative vision that is more about building more high voltage, more centralized stuff, to pipe renewable power out of areas where it's prevalent and get it to places where it's needed.

Yeah.

There's two tensions as we move forward. Should we be thinking more decentralized and more centralized? How do you think about that balance?

**KATHERINE
BLUNT:**

Yeah. I think that the answer there is somewhere in the middle. I think that distributed technology is going to play a role in how we generate and consume power. And it will change-- it has the potential to reduce the amount of large centralized infrastructure that we may need going forward. But based on these technologies and what we've got at least today, it's hard for me to foresee a future in which it really substantially eliminates the need for centralized generation and large transmission to carry it over large, long distances, just given the amount that we need.

So I think that these companies, for that reason, will continue to have a role to play there, and a very important one, not only maintaining what we have, but also adding to the system to support greater electrification in the end carbon reduction. And so the question. Is the model broken-- I mean, the model has a lot of challenges that I believe are becoming more acute. The challenge, though, is that, there's no great solution to a substantially different model, whether that be in terms of ownership, or that be in terms of the financial relationship between capital and expenses.

And so I think-- I mean, so really, the only solution is to try to work within the parameters of what we have. How do we make it better? And distributed energy has a role to play there. There's certainly-- I mean, the regulators always had a very important role to play, and has increasingly important role to play. Customers have a role to play in being educated as to what's going on and being able to actually maybe have a meaningful voice in some of this. Because I think historically, a lot of these decisions have been made so far out of the public eye simply because the public wasn't thinking about it.

We've taken for granted the lights going on and off when we want for a long time and without any major safety consequences. And then there's also just-- I mean, there's a lot of practical challenges too with a major overhaul of the system as we know it. I think that our collective challenge is improving what we've got even as the challenges become greater.

**MIKE
LIVERMORE:**

So in some sense, we have no choice but to muddle through. But we can still muddle through as well as possible rather than blindly going forward.

**KATHERINE
BLUNT:**

I hope so.

[LAUGHTER]

I hope so. I mean, yeah, I think that the experience in California, but also elsewhere, I think about that, the taxes freeze, in which 200 people died. The lights were out for several days. Other major disasters that we have, I think that it really underscores that the provision of electricity is a critical service. We need it. We can't take it for granted as we once might have. And we have to muddle through for that reason, and hopefully, with clearer eyes.

MIKE
LIVERMORE: Great. Well, Katherine, thanks so much for joining me today. This was a really interesting conversation. Thanks for the wonderful book and all of the extraordinary work and research that went into it. It's a great addition to the literature on this stuff. And yeah, it's a really fun conversation.

KATHERINE
BLUNT: Yeah, super interesting. Thanks for having me. Really smart questions.

[MUSIC PLAYING]