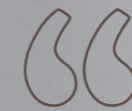


# Ben Lanz



Undergrounding has a societal benefit, a long term benefit. Investment decisions should evaluate the "total cost of ownership" of overhead versus underground over the life of the asset. This is how we will get maximum societal benefit.

Photo: Sentient Energy

Director of Strategy and Development at IMCORP  
Executive Board member at PDj²

Interview with **Ben Lanz**

**Alan Ross:** My next guest is a friend and a brother, and this is going to be fun. Ben Lanz is the Director of Strategy and Development at IMCORP. He is also an early Executive Board member of PDI<sup>2</sup>. Ben, thank you for being here.

We're going to go on two tracks. One of them is to talk about when you formed PDI<sup>2</sup>, who formed it and why it was formed, and what you think is going to happen.

**Ben Lanz:** While I was very involved in building the organization to where it is today, the original group was a smaller subset. It included Dow and Borealis as material suppliers, some wire and cable manufacturers, and companies like Quanta, who install overhead and underground power systems. We noticed that when we visit with utilities and industrials alike, there's a lot of myths and rules of thumb that people follow when they're making infrastructure investment decisions. Often the conversation went something like this: we thought about underground, but overhead is cheaper, so we went cheaper. The idea of PDI<sup>2</sup> was to form a team including a diversity of companies with expertise in different areas, combine our collective knowledge and best practices, speak to the industry with one voice, and help the industry make better infrastructure investment decisions.

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There's a whole set of myths tied to undergrounding. For example, a common myth is that if you're in a floodplain, well, water and cables don't mix, so you can't do that. The facts are that four feet below the surface of the ground, there's 100% condensing moisture. Cables are operating below ground in water or moisture for their entire life and the flooding concern is really a nonissue. People want to make informed infrastructure investment decisions, but myths like these get propagated into rules of thumb which drive poor decisions. We're agnostic as it relates to overhead versus underground, but it is clear that much more education about underground is needed. Another example is related to cost. In many cases, legacy rules of thumb drive people to say the cost of underground is X number of times of the cost of overhead, so the underground option isn't even considered. The reality is the lifecycle analysis of underground may make more sense in many more applications than people would

first realize. We're promoting sound decision making based on the lifecycle cost and giving people case studies they can use to pattern how leading utilities make investment decisions and what parameters to include in the models that they're using to justify costs.

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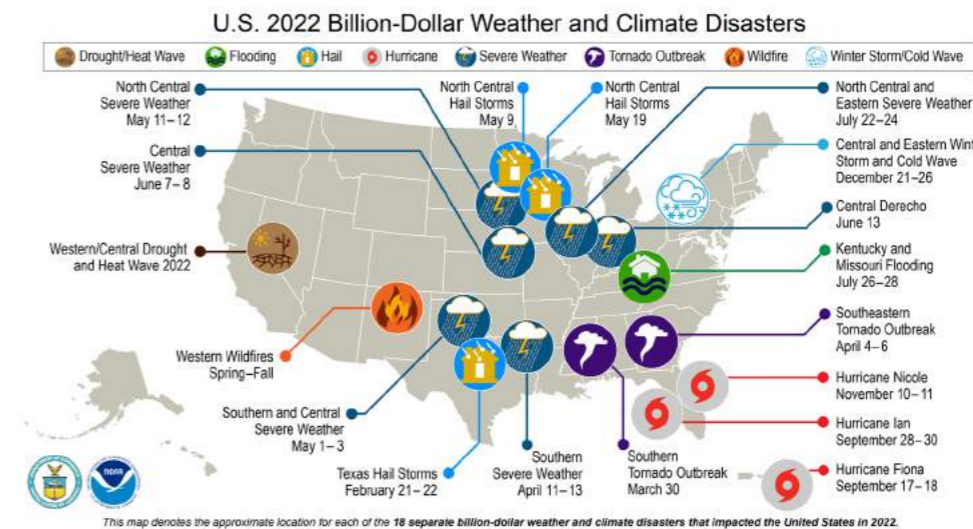
**AR** I have a son, a daughter-in-law and a grandbaby in California. My wife and I spend a good bit of time there. One of the big things in California that we deal with are all of the weather-related things and fires. But I understand there's a hunger within California utilities for that kind of information to make wise decisions. Talk a little bit about California utilities, what's going on there, and PDI<sup>2</sup>.

**BL** There are a number of reasons why utilities are strategically undergrounding assets, and that varies by region.

In California, it's the wildfires that are primarily driving decisions.

But if you look at Florida, it's the hurricanes. And Wisconsin, they have the emerald ash borer and other trees. They have 40, 50,

60-foot-tall trees coming down and taking lines out, even if they have trimmed the trees. More and more, there is a recognition that no matter where you go in the country, if you look at the NOAA website, billion-dollar natural disasters are everywhere.



Source: National Centres for Environmental Information



### Population growth in the wildland-urban interface

The number of people in the wildland-urban interface, where development and wilderness meet, expanded disproportionately in areas facing the highest wildfire risk from 1990 to 2010.



Data shows population growth from 1990-2010.

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Source: Krisha Rao 2021

Again according to NOAA, every year, we spend something on the order of \$20 billion on clean up and maintenance after storms. In California, they may not have the ice storms or the hurricanes, but they have the Santa Ana winds, and they have the fires.

There's even a term for the areas of high risk - the wildland urban interface, the WUI.

Apparently, this is where people want to live. In fact, even after the fires, according to some of the organizations that track this, people are moving back into those areas in droves. In that interface, the growth rate is higher than many other places in the country. Also, about 30% of our population lives in the first county along the coasts, so if you think about that, we apparently want to live in harm's way. It's beautiful - the oceans, the rivers, the mountains, but that's where the danger is.

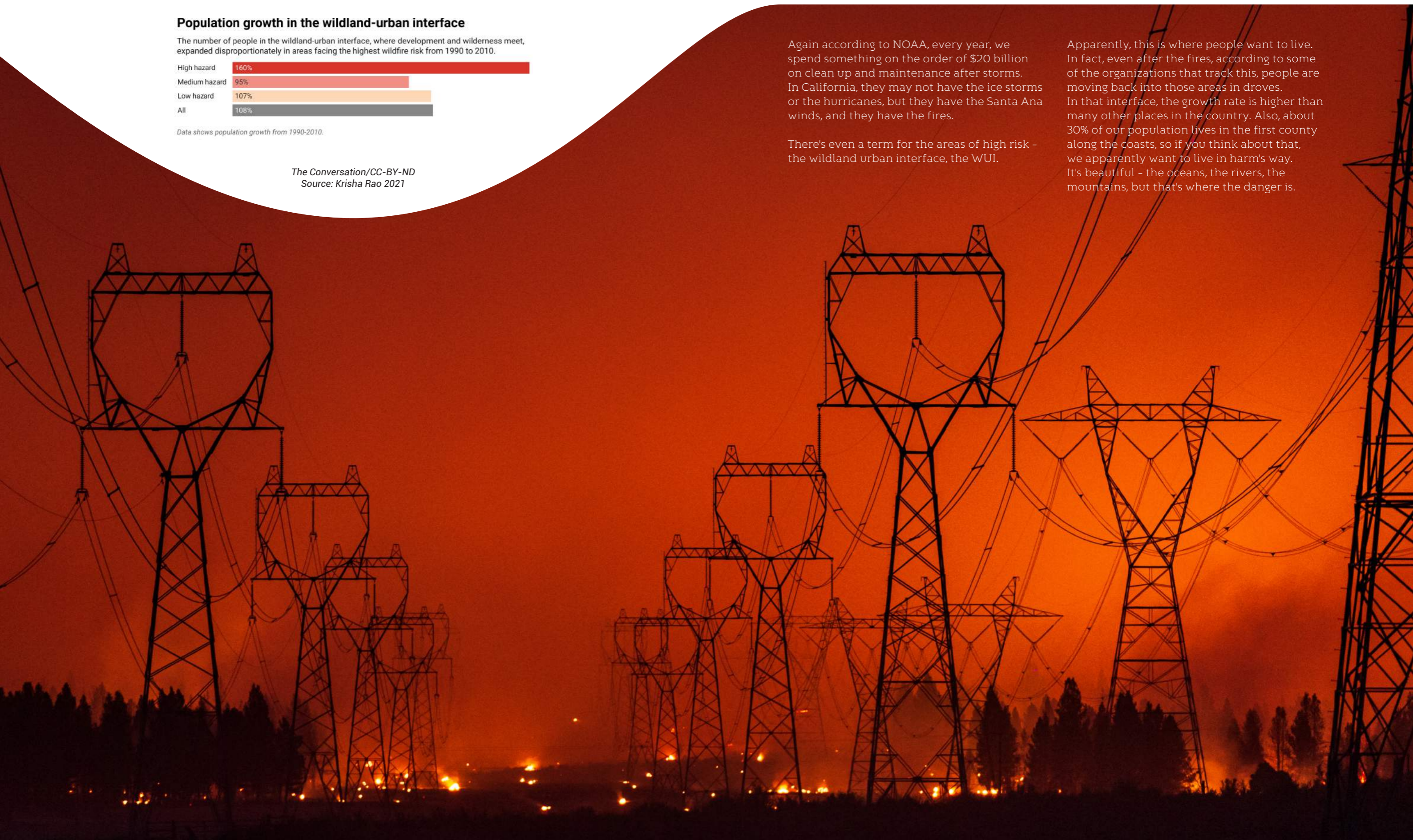


Photo: Shutterstock



List of coastline counties: <http://www2.census.gov/library/stories/2018/08/coastline-countries-list.xlsx>  
Source: U.S. Census Bureau

Historically, man has decided to live away from that kind of danger. I believe, as a society, that we're willing to somehow take that risk, because we believe it is a reasonable risk. But all of a sudden, in California you have this large population that's living on that wildland urban interface and they are trying to figure out how best to manage a power system that can ignite fires. So California has a very interesting situation. Right now they are taking counsel from the ratepayers, utilities, consultants, and they are looking for input. Usually their utility rate cases are on a three-year cycle. Now they are talking about a ten-year rate case. An opportunity to make a ten-year investment in underground. I believe California is realizing that undergrounding has a societal benefit, a long term benefit. Investment decisions should evaluate the "total cost of ownership" of overhead versus underground over the life of the asset. This is how we will get maximum societal benefit.

**AR** Is it more cost-effective from a testing and maintenance standpoint for undergrounding than overhead, or is it about the same?

**BL** No, it's dramatically different. Underground is ten times more reliable on average than overhead. That's ten times less call outs. And people will immediately say, oh, but sometimes it takes a lot longer to find the fault. Well, that was our grandfather's grid. There are these things called line sensors that are a technologically advanced and low-cost way to quickly locate underground faults. In fact, I think you had one of the companies on one of your sessions earlier this year, Sentient Energy, that has some rather sophisticated sensors. But there's also fault indicators, very simple devices that can triangulate where the

fault is. You can also use factory comparable PD testing to locate and remove the defects before the cable systems are energized. But even if you have a fault, and you have a crew who is trained to isolate and locate underground faults, you're talking about driving a minivan out there to isolate the fault instead of one of these large bucket trucks and at ten times lower frequency. Think about how that relates to operating maintenance costs. At some investor-owned utilities, they can spend five to ten times more on capital instead of O&M and have the same impact on their stock price. If you think about T&D investment from this lens, utilities want to invest in using capital to remove future O&M. So if you have a solution, albeit potentially more expensive from an upfront cost stand point, investor owned utilities can get excited about this.

**AR** I hadn't thought about that as a case for underground, but it is. Like anything, it's the total cost of ownership over the life cycle. The whole DER thing is - we've been through the problem of making it cheap, and suffering the consequences of not doing it right. People were buying \$13,000 transformers instead of \$16,000, they saved \$3,000. But now you got a gassing transformer that is significantly more costly to replace. Anyway, it's bad decisions and myths [that don't help], as you say.

**BL** And it's a lack of information. So PDI<sup>2</sup> is all about information. Anything that we produce from our research, any case studies that we document, we make that available to the public. We want people to make their own decisions, but based on solid information, and not something that's a myth or a rule of thumb that was made on our grandfather's grid and perhaps by a siloed group of individuals.

**AR** What is your exact role with PDI<sup>2</sup>?

**BL** Well, I'm the immediate past chair, which means I spent the last few years in the Vice Chair and in the Chairman of the Board position. I am thankful to say that during this time we doubled our size. And most of our growth, at least visible growth, has been in the vendor space including consultants, material suppliers, contractors, equipment suppliers, cable manufacturers, and line sensors. We're building this consortium with the companies and individuals who know how to get it done using the latest technology, and even some forward-thinking technologies, like something as exciting as using plasma torches to cut holes in rocks and accelerate trenching, even in the most difficult situations. We have some really forward-thinking ideas, but also some value we bring is just knowing how to do things at scale. For example, some of the utilities who advise us and are building systems at scale are Dominion, I believe they just announced that they hit 1800 miles of undergrounding. WEC Energy Group has installed 2000 miles. PG&E is saying that they're going to install around 10,000 miles and Florida Power and Light says 27,000 miles. There is a trend in certain areas where people see that all of the benefits are lining up. For example, with FPL, they see the gross domestic product of the state as part of the equation.

When you start thinking about the challenge of infrastructure investment from a societal standpoint, all of a sudden, the calculus changes. When several life-cycle factors line up, you're seeing some utilities really jump on undergrounding in a big way. I believe we as a

society need to decide, if we are going to live in dangerous places, are we also willing to deal with the climate and weather as it is and tolerate long grid outages after storms? Also, are we going to have predictable grid investment, or are we going to continue to experience surprise rate hikes, every three years or so because we just had another big storm? Are we going to consider the impact to gross domestic product? When the GDP takes a hit, that's actually tax revenue. If we think of the problem from a tax base opportunity, it is no longer an issue just for the utility and the regulator, it's the legislators that see the impact. For example, Dominion went and got a rider on a bill that's paying for their undergrounding because the legislators are convinced the program helps everybody in the state.

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I would say what's exciting about this movement and this trend is that people are seeing infrastructure investment as a societal benefit. It's not just a profitable business scenario, there's a larger societal benefit angle to the whole conversation.

**AR** Next time we're together, I'm going to ask you about all of that as it relates to resilience and reliability. But our time's up. Thank you so much. Good to see you.

**BL** Good to see you again.

