



IREM® From the Front Lines Podcast

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Retrofits in Occupied Buildings

Todd:

Welcome to another edition of From the Front Lines, where we discuss both the day-to-day, and one-of-a-kind issues facing real estate managers. Trevor Smith with Ecosystem joins us in this episode to talk about managing large retrofits in occupied buildings. Welcome to the podcast, Trevor.

Trevor:

Thanks, Todd.

Todd:

Can you first introduce yourself and Ecosystem?

Trevor:

Yes. Hello, my name is Trevor Smith. I am a professional engineer and project manager working with Ecosystem Energy Services. I've spent the last 15 years or so of my career working on projects that improve energy efficiency and reduce resource use in buildings primarily in and around New York City. I've always been motivated by sustainability and buildings account for something like 40% of energy use, and over a third of our total carbon emissions in the US. So there's a lot of opportunity for me to have a really fulfilling career and make an impact on important challenges facing our society today. Ecosystem Energy Services is an integrated design and construction firm operating from half a dozen offices scattered across Canada and the US. We were started about 30 years ago, based on the premise that engineers should be held accountable for the outcomes of their designs. Our founder saw a lot of opportunities with building energy within the building energy sector to improve on the experiences and outcomes of building energy retrofits by centralizing these typically separate project roles under one accountable organization. So this is a bit in contrast to the more common project delivery model, Design-Bid-Build, where the design, the construction, commissioning, they're all handled by different entities, each with their own specific interests and incentives. Our philosophy is that by consolidating these roles under one roof, we can reduce the potential for competing incentives. And then another really key component of most of our contracts, is some sort of performance-based guarantee. The goal here is to increase the overlap of our financial incentives with our clients, which we believe is really crucial to that mutual success. And we believe this is what enables the project results and client experiences that we see with our clients and really opens up the potential for addressing some of the more complicated retrofits that building owners are increasingly needing.

Todd:

Now, what sort of retrofits are we talking about? And why are your clients pursuing these projects?

Trevor:

That's a good question. Buildings are large, sometimes complicated energy networks, you know, you have your heating, your ventilation, your air conditioning, your lighting. Some facilities have distributed energy resources, whether they are solar, wind, they have battery storage, they might even have like peak load shaving generators. These are quite complicated networks for building operators to maintain. Our engineering focus is on understanding how each of these unique systems that come together in these buildings, how they're working for our clients, and we propose retrofits that address their specific needs. So there a lot of different project drivers. Our specialty is really collaborating with our clients to find where those drivers intersect to create the best value. These can include asset renewal, replacement of old aging equipment, improving comfort, and control, as well as meeting like updated regulatory compliance and sustainability goals. A really good example of this is a project we recently completed in New York City for the International Tailoring Company Building, which we're really proud to report just got recognition as Energy Project of the Year from the New York chapter of the Association of Energy Engineers. This is a large co-op located in the East Village of Manhattan. And when we started speaking with that board, several years ago, they were experiencing extensive issues with their HVAC equipment, their heating, ventilation and cooling equipment. They had major temperature and comfort control problems. They had a system which required a seasonal changeover, meaning that they couldn't heat and cool their network at the same time. So you can already imagine like, particularly during the shoulder seasons, half the building would be freezing cold half the building would be swelteringly hot, nobody was happy, nobody was comfortable. That was the acute, like the initial touch point. However, addressing those types of challenges can be quite expensive when you think about the extent of the retrofits that might be required to meet them. So we saw that additionally, they had gas fired heating and cooling equipment which was approaching end of life and it was also creating a big challenge to comply with local sustainability regulations. New York City recently set a cap on the carbon emissions from large buildings and is starting to impose financial penalties when those caps are exceeded. We were able to identify this, this confluence of critical comfort and control needs with asset renewal regulatory compliance challenges. And they just happen to overlap with some tax and utility incentives that were available at the time and really created this opportune financial window justifying that comprehensive system-wide retrofit.

Todd:

What are the challenges with retrofits and occupied buildings that can introduce additional risks to these projects?

Trevor:

I mean, there are many, the president of that co-op board, I really appreciated this quote, but he described our project as replacing the engine of an aircraft mid-flight. And I feel like that like paints a really nice picture of the types of, or the magnitude of the challenges that you can face when you're working in these occupied buildings. Our two big risks that I think of that are central to our client collaboration and design and construction planning. So for one, unlike with doing like a gut renovation or new build, it can be a really big challenge to really understand a plan for all of the existing conditions within a building during the project development, regardless of your due diligence, you're always going to run into different surprises, particularly in older buildings. Those surprises can include, you know, hazardous material, other electrical and mechanical systems that aren't working as expected. There could be, you know, old piping structures that were just buried behind, you know, a renovation performed 30 years ago, that all of a sudden requires you to totally reroute the system that you're installing. In a typical project delivery model, those existing conditions become sources of delays and cost increases which only benefit the contractors issuing

the change orders. With Ecosystem's integrated design and construction approach, the same team responsible for the design is also directly managing the construction. This really closes that feedback loop from construction back to design allowing the design team to better anticipate, even plan for unexpected conditions on the job site. Two, the other, I think more significant challenge is continuity of operation, kind of alluding to that quote, whether it's a hospital ICU, a lab, in a university, a manufacturing floor, or even your child's bedroom, construction activities are always going to have a high potential to disrupt the use and operation of those buildings.

Todd:

What strategies, in addition to your overall model of integrated design and construction, help overcome those challenges of retrofits in occupied buildings?

Trevor:

I appreciate the call out like I just alluded to, but I think planning education, relationship-building are all really critical. Those can be somewhat like innocuous terms, but I don't think they're always valued enough by the engineers and construction teams that go into these projects. You know, as engineers, we have a very technocratic way of seeing problems and navigating them and that's one of the reasons why I really have appreciated working with Ecosystem is being able to take a step back and take that more holistic view, holistic approach and really appreciate that there are so many other value-drivers enabling these projects beyond the sheer fact of you know, this boiler needs to be replaced, or this chiller needs to be replaced. From our perspective, you really need to collaborate with the owners and operators to understand what those drivers are, understand what constitutes an allowable disruption. What type of time windows are available for those disruptions? Are they daily, seasonal, or temporary services or accommodations required? We believe that for these more complex projects, the integrated design construction model really streamlines that collaboration which is required to perform these necessary system upgrades while maintaining those critical aspects of the building's intended use. So going back to that prior example, at the International Tailoring Company Building, we designed the infrastructure upgrades around in-apartment terminal units that utilize both the existing boilers, the new boilers, which were replacing, as well as these new air source heat pumps, which we installed up on the roof for heating. So we also phase the work seasonally, but we utilize that inherent redundancy of those systems to reduce operational risk because they were able to source their heat from multiple places, which allowed us to complete construction over the winter. With a single dedicated accountable partner like Ecosystem, we really make sure all the owner and operator priorities are factored into the entire project lifecycle from design through the commissioning.

Todd:

What are the end results here? Where did the properties and their tenants see the benefits in better management of these large retrofits?

Trevor:

Look, managing these projects is a challenge for anybody. You really need to have a deep technical understanding of your infrastructure, you have to be aligned with your user tenant needs and constraints, have awareness of regulatory issues impacting the project plus bandwidth for the contractor oversight, like that list goes on. I mean, anybody who's managed something even as simple as a home renovation can tell you the value of having that single dedicated partner whose financial incentives are aligned with yours, they're willing to take ownership to see a project through from concept through commissioning. We really rely on our clients to be experts at their core businesses, be they operate in hospitals, universities, residential buildings or commercial

spaces. Let us be the experts at building energy infrastructure. When we can develop that collaborative partnership and each play to our strengths, I think everybody's going to benefit.

Todd:

Thanks for joining us, Trevor.

Trevor:

Thank you, Todd. Really appreciate the opportunity to speak with you today.

Todd:

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