

Taking AI from assistance to action in solar

Emily Obenauer, Director of Product Marketing at Sitetracker, explains why the next phase of AI in solar will be less about answering questions and more about getting real work done, from managing permits and close-out packages to spotting operational risks before they become costly delays.



PES: Thanks for joining us, Emily. How are solar companies using AI in their day-to-day work, and where could it make the biggest difference?

Emily Obenauer: Most solar companies today are using AI at the 'assistance' level: surfacing information, answering questions, pulling together data that's scattered across systems and drafting documents. That's real and useful because it takes friction out of the day. But it's the shallow end.

The biggest difference comes when AI moves from telling you something to doing something: advancing a permit renewal, processing a close-out package or flagging a subcontractor whose pace has slipped before it shows up in a status report.

The industry's real constraint is getting work done quickly with flat or shrinking headcount. Solar economics have always been sensitive to time. Every day a built asset sits uncommissioned is lost generation against capital already spent.

So AI can make the biggest difference where it increases how much work a given team can reliably move forward. That's less about any single clever feature and more about where an organisation sits on a maturity curve, from assistance to AI that orchestrates workflows and, ultimately, intelligence that connects insight across an entire portfolio.

PES: There's a lot of talk about connecting AI to company data. What additional context does a solar business need to turn that into something genuinely useful for its operations?

EO: Connecting AI to your data is necessary, and it's rightly getting attention. The recent wave of enterprise AI partnerships is essentially a race to ground powerful models in real business information. But access to data and understanding of operations are two different things. Your data can be fully connected and the AI can still reason like an outsider who's been handed a folder of files.

What's missing is a domain model: a structured understanding of how a business operates and the relationships between the data it uses to do so. A permit delay on one project can affect crew scheduling on three others. A grid connection milestone gates

commissioning, which gates revenue. An asset's warranty terms can depend on maintenance events being logged correctly.

Generic AI treats each record as an isolated input. Operationally grounded AI reasons from the relationships between sites, assets, projects, workflows and accounts, the way an experienced operator carries the whole picture in their head. That connective tissue turns connected data into reliable operational judgement and is something a general-purpose integration doesn't bring or maintain on its own.

PES: Company data can tell you a lot about pipelines, contracts and project progress. What does it not tell you about the reality of developing, building and operating a solar asset?

EO: Records tell you the state of things. They're much weaker on the reality behind that state. A project record shows a milestone as complete, but it doesn't tell you that close-out validation is stalled behind a manual review of hundreds of documents. A contract tells you obligations exist, but it doesn't tell you a permit is sixty days from an expiry nobody is tracking.

Commercial data, such as pipeline, contract value and forecast, describes the business of the asset rather than the physical and regulatory reality of building and running it. That reality lives in the operational layer: the field swap that never got logged, the condition reading that didn't make it back to the system of record or the compliance evidence fragmented during a handoff between delivery and operations.

Over time, the gap between what systems say about a portfolio and what's actually installed and performing in the field can result in real financial loss. Records capture the outcome of work, not all the operational context that produced it, and AI grounded only in that outcome inherits the same blind spot.

PES: You talk about 'operational context'. What does that actually look like across the life of a solar project?



Emily Obenauer

EO: It changes shape as the asset moves through its life, which is exactly why it's hard to replicate. In development and permitting, context is knowing which approvals gate which milestones and which expiry dates and renewal triggers carry real exposure across a high-volume portfolio.

In construction and close-out, it's about pace: understanding the sequence of validation steps, spotting a subcontractor deviating from baseline and knowing when the asset is physically ready but the evidence chain isn't yet complete.

At commissioning, it's the handoff: making sure the compliance record and as-built reality travel intact from the delivery team to operations, because that's where information can be lost. In operations & maintenance (O&M) and asset management, context shifts from pace to integrity, keeping the operational record faithful to what's actually in the field so that maintenance planning, warranty management and capital-allocation decisions rest on something true.

Operational context is the through-line that follows the asset across those phases without resetting each time the work changes hands. A great deal of delay and cost in solar originates at those handoff points.

PES: Solar projects have to deal with everything from permitting and grid connections to different rules and requirements across European markets. Where do general-purpose AI tools tend to fall short?

EO: Three ways, and Europe sharpens all of them. First, general tools reason from general knowledge. They can produce a confident, generic answer about a permitting requirement without knowing the specific obligation that applies to your project in your jurisdiction. Second, they don't maintain the live state. Permit and lease management is fundamentally about tracking expiry and renewal across a large portfolio over time. A tool that answers well in the moment but doesn't persistently watch that portfolio isn't managing the risk; it's describing it.

Third is governance. Solar assets across multiple jurisdictions carry grid-code obligations, environmental monitoring and reporting commitments that must remain traceable for the life of the asset. A general-purpose tool may not provide a native answer for where data is processed, whether it stays within a required region, how it authenticates into your systems or whether every action it takes leaves an audit trail.

For companies operating under GDPR and increasingly demanding grid-operator requirements, those aren't abstractions. They can determine whether a tool is suitable for production use rather than simply for demonstration.

PES: These systems can produce an answer that sounds completely convincing, even when something important is missing. How can solar companies spot when that's happening, and what could happen if they don't?

EO: This is the risk that matters most, because a plausible-sounding answer is far more dangerous than an obviously wrong one: it gets acted on. The tell is usually grounding. Ask the system what it based its answer on. If it can point to specific, current records, such as a permit, work order or contractor assignment, and show its working, you have a basis for verifying the answer.

If the reasoning is fluent but can't be traced back to live operational data, you're looking at something built from general inference and query time framing, with a greater risk that important context is missing.

Two safeguards help. One is grounding the AI in your system of record so answers are anchored in real state rather than plausibility. The other is deterministic execution for structured work, such as permit validation, deficiency processing and reconciliation, where you want defined steps and repeatable outcomes rather than a fresh interpretation each time.

The consequences of getting this wrong can include serious delays and substantial sunk costs. In this industry, a confident answer that quietly omits something important can be the start of a much larger problem.

PES: If a solar company is looking at a new system, what should it be asking to work out whether it will actually deliver useful, reliable results?

EO: Push every claim towards demonstration in conditions that look like your reality, not a clean demo.

Ask what the AI actually connects to: live operational data or static exports configured at deployment? Does it have a domain model for infrastructure work and who maintains that over the long term? Beyond surfacing insight, what actions can it take inside your workflows and can you watch it complete one end to end? How does it authenticate, as the individual user with their permissions or through an elevated account? Is there a complete audit trail for every action, visible in the product?

Then ask the practical questions. How quickly does it deliver value from day one? Can your own team build and expand its use, or does every expansion require the vendor? Can the investment be tied to operational metrics you actually track, such as cycle time, delay recovery and throughput, rather than simply a time-savings calculation?

Ask to see it fail, too. Watch what happens when data is incomplete or conflicting, because that's normal in a live programme, not an edge case.

PES: How important is the quality of a company's existing data? And does it matter how consistently teams use the same terminology and processes?

EO: Both matter, but not in a way that should stop you from starting. AI applied to poor, fragmented data is unreliable because it lacks the grounding needed for consequential decisions. But the answer isn't to spend two years perfecting your data before you touch AI.



The key question is whether a platform can work with your existing system of record and live data, or whether it demands a major export, clean-up and migration effort before anyone sees value.

Consistency in terminology and process also helps. A domain model can recognise when different teams use different terms for the same entity and normalise that inconsistency. Standardised language and processes improve reliability, but a system built for infrastructure can also cope better with the messiness found in real portfolios than a generic tool that takes every input at face value.

PES: What are these systems already good at handling, and where does human experience and judgement still really matter?

EO: They're already strong at tasks that consume expert time without necessarily needing expert judgement: retrieving and synthesising data across systems, processing and extracting documents at volume, monitoring a portfolio continuously for defined conditions and executing structured, repeatable workflows consistently. That's a genuine benefit, and it frees experienced people from work that was never a good use of their time.

Human judgement stays central where decisions are consequential or ambiguous: exceptions the system surfaces but shouldn't resolve alone, trade-offs between competing priorities and decisions where context beyond the data, such as a relationship, commercial nuance or safety consideration, has to enter the picture.

The right model isn't AI replacing that judgement. It's AI doing the groundwork so judgement is applied where it counts, with better information underneath it. You can begin with a human confirming every step, move to supervised execution within clear guardrails as specific workflows prove reliable and extend autonomy only where that reliability has been earned.

PES: If a solar company wants to build this capability internally or bring in a specialist platform, what should it consider before making that decision?

EO: This decision has become more relevant because connecting a capable model to business data is easier than it was a year ago. That lowers the apparent barrier to building internally, but organisations still need to consider the ongoing engineering required as underlying models change, the specialist talent needed to maintain and extend the system and the work involved in constructing domain context and operational integrations.

A strong general model connected to commercial data can provide useful grounding relatively quickly, but it won't automatically understand asset-lifecycle issues such as permitting logic, construction and O&M workflows or sector-specific governance.

Operators therefore need to weigh the time, specialist resources and domain knowledge required to build and maintain that capability internally against what a specialist platform can provide. The question is whether AI infrastructure is where you want your differentiation, or whether your advantage is better focused on how you develop and run assets.

PES: Looking ahead, how do you see this technology changing the way solar projects and assets are managed? And what can companies be doing now to make the most of it?

EO: The European solar industry is entering a phase of consolidation and professionalisation. The operators best placed to respond may not necessarily be those with the most capital or the largest land banks. Efficient use of capital, effective project delivery and reliable data and compliance records are likely to become increasingly important.

AI could play an important part in that, but the trajectory matters more than any single capability. In the near term, expect AI to move from assisting towards orchestrating, advancing real work inside operational systems rather than just reporting on it.

Further out, the opportunity is intelligence connected across an entire portfolio: spotting risk patterns across assets, improving maintenance decisions with operating data and allocating capital according to how assets are genuinely performing.

The practical priority is to get the foundations right. Start with a clearly defined workflow and clear success criteria, then assess the results before extending AI into more operational areas. Look beyond the demo at operational fit, governance and a realistic path for wider use.

AI Playbook for Critical Infrastructure

AI Buyer's Guide for Critical Infrastructure

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