Once the pile drivers leave: training Europe's solar fleet

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As Europe's solar fleet continues to grow, the challenge is shifting from installation to long-term performance. Advanced diagnostic tools can help identify faults faster, but practical training and experienced judgement remain essential to keeping solar assets operating safely and efficiently.

Across Europe, the pace of new solar installations is easing. The EU still added 69 GW in 2025, but the EU Solar Jobs Report 2026 expects deployment growth to stall for the rest of the decade. New systems are still being installed, while existing ones need maintenance. Even the UK, still racing to more than double its fleet by 2030, faces the same arithmetic: every plant spends a year or two being built and the rest of its life being run.

That load is getting heavier. In June 2025, solar became the EU's largest source of electricity for the first time, according to Ember, and even with slower growth the fleet is growing faster than the number of people who can keep it running.

If you've watched a fault take longer to find than it should, you've seen that gap at work. The diagnostic kit in an operations & maintenance (O&M) van has come a long way. Whether the people using it are being trained fast enough to get the most from it is another matter, and one the industry has yet to settle.

The experience gap in solar operations & maintenance

The more pressing shortage is of technicians who can step onto an operating site and troubleshoot without adding risk. Construction and O&M simply don't ask for the same kind of skills.

On the build side, utility-scale work can absorb more task-based labour, including heavy racking crews and standard electrical work. O&M is where field judgement takes over. On live systems, quickly tracing a fault to modules, DC main cables or inverters without creating new hazards is work you can't hand to a task-based crew.

For years, many companies solved this by drawing O&M technicians directly from construction. The people who moved across already knew how systems had been assembled and what 'normal' looked like in the field. Europe is about to test that model across the sector.

The build-out may be slowing, but the fleet is still growing; the industry's own forecasts see deployment jobs shrinking over the rest of the decade while O&M work grows. If even part of that workforce moves across, O&M teams will be hiring people who know how to put an array together but have far less practice at working out why one has stopped producing.

Picture a string reading low on an otherwise healthy inverter. Someone fresh from the build may well recheck the terminations first, because that's what handover drilled into them, while an experienced O&M technician is already asking whether the shortfall follows irradiance or sits behind one combiner box.

Recruiting alone won't resolve the issue, and in some trades it can't. Electricians are among the scarcest skilled workers in Europe right now. In the UK, an industry trailblazer group is exploring new solar apprenticeships with Skills England, pointing clearly to where the sector must go next.

The challenge is helping new recruits develop the skills to make sound diagnostic decisions, even when field readings are ambiguous.

What practical training looks like

Strong solar training starts with safety, because the rest of the workflow depends on trusting the equipment and the setup. Hazard recognition and a firm understanding of CAT ratings form the absolute baseline. From there, technicians need a working grasp of the testing procedures set out in IEC 62446-1, moving logically through polarity, open-circuit voltage (Voc), short-circuit current (Isc) and

insulation resistance, with current–voltage (I-V) tracing as the next step up.

If training skips those basics and jumps straight to advanced diagnostics, you get slower decisions and weaker field judgement, especially when readings do not behave as expected.

Effective training needs to be practical from the outset. It teaches technicians to read a multimeter properly and use basic voltage and current logic to narrow a fault path. They learn why insulation resistance testing belongs in the standard test regime, and what thermal imaging or I-V curve data can tell you that voltage and current measurements cannot.

A common mistake shows why context is crucial. A hotspot on a module may indicate a defect, or it may be nothing more than reflected sun. By simply stepping sideways to see if the hotspot moves, a technician turns a raw tool reading into a sound diagnosis.

Who counts as competent to open a combiner box on a live string? Across Europe, electrical safety rules address that in general terms through the skilled-person provisions in EN 50110-1 and its national versions, or Great Britain's Electricity at Work Regulations.

Those rules lean on a familiar safe state: isolate, lock off and prove dead.

Anyone who's worked a solar site knows a PV array in daylight never quite gets there. An electrician fully at home on a residential distribution board, though, may never have worked on a circuit that stays live after it's isolated.

Neither rule spells out what skill looks like on a PV array, so the solar-specific skills, such as interpreting an I-V curve or a low insulation resistance result on one string, are left to employers and the training they invest in.

Where technology helps and where it does not

While training builds that necessary baseline, technology helps most when it removes avoidable work. A tool that takes the technician directly to a fault location or highlights an outlier in measurement results is useful because it reduces routine errors and gives the technician a cleaner starting point. That's important in solar because the diagnostic workflow is notoriously fragmented across different instruments.

Voltage and current checks, insulation resistance, thermal imaging, I-V curve tracing and monitoring platforms can each tell you something different. The practical gain comes when those readings are captured and tracked over time, so they stop disappearing into separate devices or paper notes.

Of all those readings, the commissioning set matters most: every later test is judged against it, so a thin baseline leaves each future diagnosis with less to go on. Digitised inspection, including robotic systems, is becoming more common across large portfolios and may help reduce O&M costs.

That still leaves the hard part untouched. Technology can narrow the search, but it doesn't settle what a reading truly means or dictate the next steps. A ground fault locator might save a technician from doing the maths manually, and module-level monitoring can flag an underperforming unit.

Neither replaces the field judgement required to distinguish a genuinely damaged conductor from a distorted system signal. Better tools help most in the hands of people who understand the workflow behind them. They can make fault finding easier, but there is no shortcut to sound diagnostic judgement.

Why training needs to be a system

Treating training as a one-off course is one reason why technician capability stalls. Performance changes when training becomes a structured system. Operators need defined technical levels and clear milestones that give technicians a visible way up beyond entry-level tasks. European practice already supplies a first rung, which is the step up to a skilled person under EN 50110-1. The rungs above it, covering the solar-specific skills the standard leaves open, are the ones you have to build yourself. One place to build them is on the job, under supervision.

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Pair a newer technician with an experienced one on real faults, and ask the experienced hand to think aloud: why this string first, why that reading doesn't fit. Judgement that has only ever lived in one person's head gets passed on before it walks out of the door. Training must directly connect to performance reviews, pay progression and role development; otherwise it stays separate from the daily work it's supposed to improve.

This operational shift is important because the usual management objection to investing in training misses the real risk. The problem isn't that you invest in someone and they leave. The problem is that you don't invest, they stay, and the site absorbs the financial hit. You end up paying for slower fault diagnosis and weak handover decisions, driving up the cost of entirely avoidable downtime.

The UK government's Solar Roadmap puts the underlying problem bluntly: 'There are few clear paths to competency within the solar sector.' The timing is tight, too, with the roadmap expecting many of the people already working in solar to retire within five to ten years. In solar O&M, clear routes to competency are a hard operating requirement.

Turning growth into stable performance

The longer-term test for Europe's growing solar fleet is keeping that capacity performing reliably once it is in the field. Advanced tools give you a clear operational advantage, accelerating fault tracing and making weak diagnostic signals visible. But when an array behaves unpredictably and the data is ambiguous, who actually makes the call?

Thorough training lets a technician safely interpret those readings and dictate the next move. Ultimately, the asset owners and O&M providers who thrive will treat hardware and human judgement as equal investments.

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About Fluke

Founded in 1948 and headquartered in Everett, Washington.

Fluke specialises in electronic test and measurement equipment for industrial, electrical and maintenance applications.

For the solar industry, its range includes digital multimeters, thermal imaging cameras, insulation resistance testers and specialist photovoltaic testing equipment.

These tools support technicians working on solar installations, commissioning, fault diagnosis and ongoing maintenance.