

Tackling the solar skills shortage: experts from the US, Europe and the UK on best hiring and training practices

Skills Shortage | PV Tech Power Editors JP Casey and John Lubbock and Reporter George Heynes caught up with several experts to talk about the skills shortage in the solar industry in the UK and abroad and how this growing industry is approaching the issue.



Credit: Ricardo Gomez Angel via Unsplash

With national governments setting increasingly ambitious solar power generation targets, private companies more eager than ever to invest in the sector and think tanks around the world forecasting greater solar power production over the coming years, there is much to be optimistic about in the global solar sector.

However, the shift in the global energy mix from one reliant on fossil fuels to one driven by renewables, and solar in particular, will require many aspects of this industry to change, and in short periods of time. One form of pressure on the global solar supply chain is in recruitment and training, with the world's

demands for clean power changing faster than the years-long processes such as the education of a student to university level, the latter will have to change to meet new employment demands.

Each new forecast about employment in the solar sector, therefore, brings challenges as well as opportunities. SolarPower Europe, for instance, reported that in 2020, the European solar sector created 357,000 jobs, up from 81,000 in 2016. The industry body expects this figure to more than double to 742,000 by the end of the decade, and adequately educating and training nearly 400,000 people in the solar power sector will be no mean feat.

Workers installing a solar panel

This phenomenon is apparent all over the solar sector, from research to installation, and all over the world. Earlier this year, the US Solar Energy Industries Association estimated solar manufacturing jobs in the US alone to triple over the next decade, mirroring the trend in European solar power, and raising questions as to how these positions will be filled.

PV Tech Power speaks with a number of experts from the global solar industry about how their particular sub-sectors, and jurisdictions, are aiming to tackle these challenges.

Aaron Brickman, senior principal of the US programme at think tank RMI,

speaks on the opportunities in US solar following the passage of the Inflation Reduction Act; Arthur Daemers, policy advisor at SolarPower Europe, discusses the impacts of shifting solar demand on individual European countries; and Gareth Simkins and Gemma Grimes, senior communications adviser and director of policy and delivery, respectively, at Solar Energy UK, explore a number of initiatives in the UK to overcome these obstacles.

Do you believe there has been a skills shortage in your sector within the past 10 years?



Aaron Brickman
Senior principal at RMI
Credit: RMI

In solar, there are just not enough workers, and there are not enough trained workers. Who's going to be doing the research and development? Who's going to be doing the testing and all those interesting things? And then who's going to be installing all the solar and [performing] whatever limited maintenance [is necessary]?

The solar workforce needs are growing enormously. The projections for that necessary workforce have ballooned, and yet these aren't unskilled jobs. There does need to be a strategy, and in lieu of a national strategy, which the US typically doesn't have in the labour market, it's up to states and metropolitan areas to figure this all out.

There's going to be a tonne of investment, new entrants, existing entrants, expanding capacity, [the] opening [of] new facilities, and then our workforce needs. If you're hovering over the scene, you're trying to figure out, well, 'what does this mean?' 'How would a place approach this?'



Arthur Daemers
Policy adviser at Solar Power Europe
Credit: SolarPower Europe

There has been a skills and workforce shortage in our sector, and it risks increasingly impacting the market.

The sector has been feeling pressure at the end of the value chain, at installations. The number one reason for citizens across the continent waiting months – or over a year – for their rooftop solar systems is a lack of installers and electricians. Last year, for example, the German

Solar Association recorded almost 17,000 vacancies for 'construction electricians', who are key workers for solar. We need to attract workers fast, to ensure they do not become regular bottlenecks for deployment.

On the other hand, we also face risks related to the quality of installations. Here it is really about skills more than numbers. Workers installing solar at the moment can be from several professions, depending on the availability of workers, national legislation or choice of the company.

Because those are not necessarily specialists, project developers and asset managers are warning of quality and security issues, which in turn can hurt the reputation of solar. Quality training and high standards of installation are critical to the future of solar. Quantity and quality are two equally key challenges.



Gareth Simkins
Senior communications adviser at Solar Energy UK
Credit: Gareth Simkins

It is certainly a challenge to find suitably qualified people for roles in the UK solar industry at the moment. The skills agenda ranks with the difficulty in securing grid connections as the biggest brakes on the sector's growth.

The situation has had obvious consequences. The lack of personnel, combined with Covid-related supply chain hiccups contributed to long waiting times for residential installations last summer. Solar Energy UK anticipates that the industry will support around 60,000 jobs in 2035, up from around 7,000 in 2020. Action is needed to fulfil this potential. Without it, the skills challenge will become ever more acute, restricting the pace of installation and raising prices as demand rises ever upwards. The situation clearly cannot be allowed to continue.

That is why addressing it is one of the key priorities for the government-industry Solar Taskforce, which first convened in May. The taskforce's skills sub-group will identify the skills and training needed for the solar industry's future workforce, looking at both the short and long terms. The taskforce is expected to deliver its conclusions in February 2024, setting out a roadmap for reaching the UK government's 70GW capacity target by 2035.

What is the current climate for hiring new graduates to join the solar sector?

AB: I think there's a strong need to develop multiple pipelines, not just one. You're looking at ensuring that folks know there are different career paths. There's also a generational battle against legacy sort of mindsets around what manufacturing is, and means, in the US. People have a mental image of manufacturing that no longer meshes with the reality of advanced manufacturing in this country.

And there's this, of course, systemic thinking that college is important, and, of course, it is, for so many people. But there are [a variety of] paths to a family-sustaining wage, a good career, good benefits in an industry that is projecting growth for the foreseeable future.

I think it's fair to say [that] apprenticeship is not new in the US, but it's not well understood, in contrast with several European models, [such as] the Swiss or Austrian or German models. Apprenticeship in the US, particularly straight out of high school, is not a commonly-discussed career path. I think that's also part of the equation, and that's also where policy and industry and workforce development and planning and economic development come together around changing mindsets around what this is and what it can be.

AD: The current climate for hiring new recruits is relatively tense. In the energy, digital and engineering sectors, there is fierce competition to attract the most qualified professionals.

[This is true] amongst energy and installation companies, but also with the rest of the digital world, including telecoms. We see this as a sign of a fast-growing sector that is eager to hire the best project developers and engaging in a race against all other sectors.

One key consideration is the diversity of legal frameworks for training solar installers in various EU member states. In Germany, after two weeks of training, you can carry out the basic work of rooftop installations, without being able to handle electricity. In Ireland, any worker involved with a solar installation needs four years of state-recognised education.

There is probably a middle ground to be found here. On one hand, we may

look at the German system and think it is fast, but not without risk. On the other hand, the Irish system requires you to go through very generic and long electrical training, which in some cases is probably surplus to requirements. We may want to have standardised re-training schemes that allow you to utilise pre-existing skills and micro-credentials and teach you specifically the skills that you lack for solar installation.



Gemma Grimes
Director of Policy & Delivery
at Solar Energy UK
Credit: Solar Energy UK

Skills will be a new focus for this year's Solar & Storage Live, with the introduction of the recruitment zone, sponsored by SSE Energy Solutions and run by Solar Energy UK. This will allow hiring businesses to promote their vacancies [and] recruit candidates directly from primarily Midlands region organisations, including dozens of colleges, universities and job centres.

High-calibre talent can also be hired via specialists such as Totaljobs and Mission Renewables. Furthermore, visitors will be able to join high-level conversations about workforce development within the industry.

What are the key considerations when retraining professionals to work within the solar sector? Are there examples of collaborative projects that have been effective in this area?

AB: RMI is leading work in the Great Lakes around helping seven Great Lakes states to determine clean tech sectors that make the most sense for regional competitiveness. And as part of that work, we've extensively looked at existing industrial capacity and existing skills capacity, and that has helped us narrow down the sectors in those states, where we think there's the greatest likelihood for cluster development and business attraction for job creation.

We know that places can figure out what skills they have, and from that an understanding, [of] what job sets are taking place and what skills their workers have in large numbers, and how that information can then be applied to other existing industries, and attracting new industries. That is playing out in solar.

Offshore oil and gas to offshore wind

is one of the easier transferable skill sets; not every position, not every role, not every person, but it's one of the easier skill sets to think about in terms of that transferability. It's not always as simple obviously; semiconductors and solar have some commonality [and] certain clean manufacturing processes certainly have commonality. But there's always going to be certain training necessary, specific to a manufacturer, specific to that company and then specific to that industry.

AD: For the blue-collar workers, the challenge is different, and potentially more difficult. There is not necessarily an intuitive overlap between coal mining and climbing on a rooftop, place modules and connect an electrical system. This will require reskilling to overcome. We already see successful communication campaigns in this area, like the one Enpal is running. The German solar company is attracting workers from even non-traditional backgrounds, like hospitality or food delivery, to retrain and join them as solar installers.

Skills projects like this benefit national decarbonisation efforts and support the just transition and social cohesion. So there could be a role for governments to help replicate that best practice, and cover the additional costs of training new hires, or retraining from declining industries.

Rooftop installation



Credit: Bill Mead via Unsplash

GG: Participants [in the UK Solar Taskforce] include British Solar Renewables, the Energy and Utility Skills Partnership, the Institute for Apprenticeships and Technical Education, Octopus, South Thames College, the National Open College Network, the Electrical Contractors' Association and the Institute of Environmental Management and Assessment, to name a few.

Key aims are to maintain and improve the quality of installations as the sector scales up, improving diversity and ensuring that young people, those changing career and those returning to the jobs market are aware of employment and training opportunities in solar energy and the skills needed for it.

Even before the Solar Taskforce was agreed, Solar Energy UK was working with the Mayor of London and MCS on the Solar Skills London project. This involved going into schools to deliver talks on the jobs available in solar, and encouraging young people into 'bootcamp' courses to prepare them for apprenticeships. MCS is now managing the scheme.

Meanwhile, the Green Skills Academy, launched in Manchester earlier this year, trains people to install PV, heat pumps [and] EV charging. A number of similar institutions and courses have also popped up lately, a clear indication of the demand for such skills.

What is hiring and training going to look like in 2030 for the solar sector? What innovative methods do you believe will be introduced?

AB: I think what we need to see is much more methodical coordination and collaboration in states and metros that pull together the non-college workforce development and training, university- and college-level training and policies at the governmental level that incentivise those things, to not just make those locations attractive for investors, but to play in and play well with the Inflation Reduction Act.

When these announcements have turned into investments – so an announcement of committed capital versus turning Earth and readying a site versus finalising the investment and hiring people and then understanding what the production capacity is, what the manufacturing capacity is – a solid trackable data set that's as close to real time as possible would be, I think, really important.

AD: This requires numerous reforms and efforts, among which two are particularly urgent. First, education systems must adapt to this reality. Climbing on rooftops and installing solar systems is a job of the future. Schools must integrate this and communicate this to students. Vocational [and] technical education must be encouraged from a young age everywhere.

Electricians are already high in demand, and we will need more. Why are we not pushing students to go in this direction? This [affects] communication, but also resources, language used in classrooms and overall appreciation for those branches.

The second would be a recognition of 'DC electricians' as a new profession in Europe. Rather than asking for electricians to carry out the entire work, we may want to train specialists in less than five years, to undertake work that would take some load off the electricians. They would have a faster training, using modular apprenticeships. Recognising their micro-credentials and overall skills acquired via different experiences and retraining them to become DC electricians efficiently may be the way to go. Then, hopefully, this kind of model can be replicated and harmonised across Europe, allowing movement and synergies.

Gemma Grimes, on the UK: I think the main problem is that people aren't aware of the potential jobs in the sector, and

we as government and industry aren't pro-actively promoting the sector in a joined-up way, or as much as we could be.

How can legislation make a difference on solar project development? Has this translated to any particularly impactful initiatives?

AB: An economic development organisation is an entity trying to build out an industrial cluster we want. We are doing these things related to solar or directly related to solar, and because we have strengths there, we know that we can attract more businesses, we're talking to these businesses [and] some of them are already committing.

That means that's a location that can feel pretty positive that investments by their workforce development, board or organisation, or investments by government, or passing new laws to incentivise training programmes or similar, would be money well spent.

If you don't make the investments, then you'll be less attractive to potential investors, new entries, or if you don't make the investments, you could be in a healthy situation now, but with workforce needs and what they're going to be, you could be much less attractive later, or worse. What's worse is when you position your location as having assets that can be directly attributable and beneficial to potential new entrants in an industry like solar, and then not meeting those expectations.

AD: There are multiple initiatives already helping companies recruit solar workers and train them. The way forward may now be to spread good practices around the continent and harmonise the legislation.

At SolarPower Europe, we've launched the #SolarWorks platform. It's a one-stop-shop for potential solar workers to find job vacancies, or training to attain the jobs they seek. We even run a #SolarWorks TikTok account aimed at the next generation of solar workers.

We will need 1.5 million workers by 2030. That is to reach our target of 1TW installed solar in the EU. Currently, 79% of jobs are associated with the deployment of solar, as opposed to building or recycling them, for instance. Out of those deployment jobs, 76% are associated with rooftop solar. This tells us that there needs to be a clear focus on hiring and training vast numbers of people into rooftop installation jobs.

Are there examples of projects and initiatives on the state level in the US, or on the level of individual countries in Europe, that have been particularly significant?

AB: Think about it in terms of viewing the intersection of industry – existing and future industry – new entrants, economic development organisations, workforce development organisations and government and policy. How those different elements can be coordinated around understanding what's there now, and what's coming; it is so important to understand what the workforce they're going to need is, not the workforce they need today, but the workforce that they're going to need.

Training programmes, apprenticeship programmes – the Inflation Reduction Act incentivises apprenticeship – [are all] part of the stacking, in terms of tax incentives and other incentives that can be brought to bear.

AD: On the European level, we're leading the Renewable Energy Skills Partnership, with the backing of the European Commission. It's a platform where renewable industries get together and share good practices and challenges in this field. Together, we have the opportunity to launch an EU-funded project aimed at developing training materials to be disseminated across the continent.

If European training providers are willing to join us on this journey, we could successfully tackle both the quantity and the quality challenges within the next three to four years.

Generation Spain is a wonderful example of an NGO in Spain giving opportunities to unemployed, or transferring professionals into solar. They help them get internships or apprenticeships, which turn into long-term jobs.

We also follow closely the German start-up initiative 'Ohne Hände keine Wende' (paraphrased: 'no industry transition without workers'). They are developing a training platform for solar and heat pump workers via modules. It is a very flexible and quick method allowing for recognition of micro-credentials from other experiences. People would only take up the modules allowing them to learn their missing skills.