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PERSPECTIVE

# Do solar panels contain PFAS?

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## ABSTRACT

***This perspective examined claims about PFAS in solar panels using the available scientific evidence. We found that while certain fluoropolymers are used in photovoltaic manufacturing, they are not appropriately classified as toxic PFAS. Mischaracterizing fluoropolymers as hazardous PFAS may unnecessarily undermine public confidence in photovoltaic sustainability.***

The presence and potential leaching of PFAS (Per- and Polyfluoroalkyl Substances) from solar panels are increasingly mentioned in news articles, raising public concerns. Such concerns may slow the adoption of photovoltaic (PV) technology, despite its central role in the renewable energy sector. The limited transparency from manufacturers about fluorinated materials used in PV modules, along with the scarcity of publicly available testing data, contributes to uncertainty and speculation. This perspective aims to clarify the current state of PFAS presence in solar PV. Although certain fluoropolymers are used in PV manufacturing, the scientific consensus on their toxicity indicates they should not be classified as PFAS. Portraying fluoropolymers as toxic PFAS unnecessarily amplifies concerns and unfairly undermines the perceived environmental sustainability of PV technology.

**Keywords** hazard · waste management · renewable · sustainability · environmental impact

### Discussion

Should manufacturers be encouraged or required to disclose polymer additives used in solar PV components to improve public trust, even when toxicity concerns are low? Could inconsistent media reporting on emerging contaminants inadvertently slow PV adoption by eroding confidence in renewable energy technologies?

## Introduction

Solar photovoltaic (PV) is expected to dominate renewable energy capacity additions to meet clean energy goals. As the PV installations grow, public concerns have shifted from carbon emissions to the potential release of toxic materials from solar panels at end-of-life or during operation. In the past, much of the environmental concern around solar panels centered on the release of heavy metals, such as lead or cadmium, from damaged PV panels.[1]

Crystalline silicon is the dominant PV technology and often contains lead in interconnection.[2] Earlier research reported lead release under aggressive conditions used in standardized waste characterization methods.[3] However, studies employing more realistic conditions, such as larger sample sizes and minimal agitation, have shown limited metal leaching.[4] Metal leaching is significantly influenced by the size of module fragments. While laboratory leach tests typically use fragments $<1$ cm to simulate worst-case scenarios, actual landfill environments tend to result in much larger fragments. A study by Sinha et al. (2014) found that typical PV module fragments in landfills are larger than 1 cm, leading to lower leaching rates compared to laboratory-scale tests that use finely crushed material.[5] This suggests that metal leaching in real-world conditions is less severe than often portrayed in lab-based studies.

Another metal of concern in solar panels is cadmium, primarily used in Cadmium Telluride (CdTe) PV technology. Due to public concerns about its potential environmental and health impacts, significant research and development efforts have been focused on minimizing cadmium usage and improving recycling practices.[6] CdTe panels contain less than 0.1% cadmium by weight. First Solar, for instance, operates on-site recycling facilities at its manufacturing locations, recovering over 90% of materials from decommissioned solar panels.[7]

Importantly, cadmium in CdTe form is chemically stable and far less soluble than elemental cadmium, which likely reduces its toxicity. [8] Studies have shown that even under the most extreme cases, such as fires involving rooftop CdTe systems.[9] or broken panels exposed to heavy rainfall.[10] the resulting cadmium concentrations in soil, air, and groundwater remain well below levels of concern for human health.

Over the last decade, the PV industry has conducted extensive research to quantify metal release and explore ways to replace or reduce lead and cadmium use in solar panels. Concerns about metal release from solar panels are not as high as previously believed.[11] While extensive research.[12] has addressed metal leaching concerns, attention is now shifting to a new issue: per- and polyfluoroalkyl substances (PFAS) in solar panels.

PFAS have recently emerged as a potential toxicological concern for solar PV. The common concerns are that (1) *solar panels contain PFAS, and* (2) *damaged solar panels can release PFAS, potentially contaminating both soil and groundwater during operation.* This article seeks to clarify the PFAS presence in solar panels, reviewing current literature and survey responses from industry and academia experts. Our intent is not to magnify uncertainty, but to assess whether the prevailing concerns are scientifically supported and to identify the key research and regulatory gaps that must be addressed to ensure the safe and sustainable expansion of solar PV.

### What are PFAS? Why is the public concerned about them?

PFAS refer to a broad class of thousands of synthetic chemicals characterized by carbon–fluorine bonds, one of the strongest in organic chemistry.[13] This bond contributes to their chemical persistence in the environment and water or oil repellency. PFAS have been widely used in industrial applications and consumer goods such as firefighting foams, textiles, food packaging, and electronics.[14]

A key concern with PFAS is their environmental persistence. PFAS were initially thought to be non-toxic, and little attention was given to their environmental fate and potential human health impacts. However, over the past decade, PFAS have become a serious concern due to their ubiquitous presence in the environment.[15] PFAS are commonly grouped into long-chain and short-chain compounds, which differ in their environmental behavior and toxicological profiles. Long-chain PFAS like perfluorooctanoic acid (PFOA) and perfluorooctane sulfonic acid (PFOS) have shown bioaccumulation potential in humans and the environment. Short-chain PFAS, which have been introduced as replacements, generally exhibit lower bioaccumulation potential.[16]

PFAS compounds exhibit a broad range of toxicities, solubilities, and environmental mobilities. Exposure to PFAS has been linked to an increased risk of cancer, immune system suppression, and developmental issues in offspring.[17] The complexity of PFAS chemistry, including numerous degradation products and polymeric derivatives, presents challenges in toxicological assessment. Consequently, unlike other pollutants, determining the toxicity of PFAS is challenging due to the presence of thousands of these compounds in complex mixtures.[18]

Concerns about PFAS emissions have become a prominent issue raised by the public in relation to utility-scale solar projects.[19] In the U.S., growing opposition from local communities has been observed.[20,21] particularly in regions that supply drinking water.[19] Residents with prior experience of PFAS contamination in their water supplies tend to be especially vigilant and cautious about potential new sources of exposure.

### What are fluoropolymers? Should we worry about them?

PFAS encompass thousands of chemicals that vary widely in toxicity and solubility. Within this broad group, fluoropolymers represent a distinct subset, encompassing 38 distinct compounds out of approximately 9000 PFAS compounds.[21] While they technically meet the structural definition of PFAS, being fluorinated organic compounds with at least one fully fluorinated carbon atom, fluoropolymers are large, insoluble, and biologically inert. As a result, they are non-toxic and pose minimal risk to human health or the environment.[22]

Fluoropolymers exhibit markedly different toxicological profiles compared to most other PFAS chemicals.[23] Recognizing this distinction, the UK Health and Safety Executive, in its April 2023 Regulatory Management Options Analysis, recommended exempting fluoropolymers from PFAS regulations, citing substantial evidence of their low risk and safe usage.[24] Similarly, the Organization for Economic Cooperation and Development (OECD) has noted that some fluoropolymers satisfy all thirteen criteria for classification as Polymers of Low Concern (PLC), suggesting they should not be automatically grouped with PFAS for regulatory purposes.[25,26] Multiple studies have echoed this position, asserting that fluoropolymers are low-risk and should be treated as a separate regulatory category.[27,28] Accordingly, labeling all fluoropolymers as hazardous solely because they fit the structural PFAS definition is scientifically unsupported and potentially misleading.

That said, a related legitimate concern regarding fluoropolymers is the method by which they have historically been manufactured.[28] In the past, manufacturers used PFAS-based processing aids (surfactants) like PFOA or PFOS to produce certain fluoropolymers (for example, during the emulsion polymerization of PTFE). The most common of these aids were PFOA and PFOS, both now recognized by the U.S. EPA as hazardous substances under Section 102(a) of CERCLA.[29] In response to their toxicity and environmental persistence, drinking water limits for PFOA and PFOS have been set at 4 ng/L.[30]

However, it's important to note that PFOA and PFOS have been phased out by eight major manufacturers, both in the U.S. and globally.[31] Furthermore, certain fluoropolymers, such as granular polytetrafluoroethylene (PTFE), are produced without the use of PFAS-based processing aids. For those fluoropolymers that still rely on such aids, manufacturers are actively developing and implementing non-PFAS alte rnatives.[32]Additionally, fluoropolymers are used in a variety of forms, such as granules, fine powders, or aqueous dispersions, and their health and environmental impacts can differ depending on their production method, used form, and end-use applications. Nonetheless, the trend in the industry is clearly moving toward safer, more sustainable manufacturing practices.[31] This means new PV module components made of fluoropolymers are unlikely to carry residual PFOA/PFOS, though older materials produced before these changes could contain traces. In short, not all PFAS are created equal. Any discussion of PFAS in solar panels must carefully consider which PFAS are at issue–a high-toxicity contaminant like PFOA, or an inert polymer like PVDF–as the risks would be dramatically different.

### *Where might PFAS or fluoropolymers be found in solar panels?*

PFAS or fluoropolymer compounds may be present in certain components of PV panels. PFAS could enter this bill of materials in a few niche areas due to their advantageous properties (weather resistance, hydrophobicity, dielectric strength). Potential uses of PFAS in solar panels include:

1. **Front glass coatings:** Some solar panels have special coatings on the glass to reduce reflection (anti-reflective coatings) or to make the glass surface self-cleaning (so dirt and water roll off more easily). While many commercial solar glass coatings are silica-based or use titania and other non-fluorinated nanomaterials, there have been experimental coatings incorporating fluorinated compounds for hydrophobicity. For example, lab-scale studies have tested fluorinated silane or fluoropolymer additives to create water-repellent solar glass.[33] However, to date, there is no public evidence that mainstream module manufacturers use PFAS-based coatings on their glass at scale – many opt for alternatives like silicon dioxide or proprietary non-PFAS formulations. Even if a fluorochemical were used on solar glass, it would likely be in trace amounts and chemically bonded in a durable layer, not something that washes off readily.[34]
2. **Backsheet films:** The backsheet is the outermost layer on the rear of a PV module and is crucial for electrical insulation and as a barrier against moisture ingress. Many conventional backsheets incorporate fluoropolymers. A common design uses PVDF (or related fluoropolymers) as the outer layer, typically laminated to a PET core.[36] Dupont's Tedlar® film (polyvinyl fluoride, PVF) was an early industry standard; notably, PVF is not considered a PFAS under many definitions because its polymer backbone is not fully fluorinated, and its manufacturing process does not rely on PFAS chemicals.[36] Newer backsheets from some suppliers use PVDF, which is technically a PFAS polymer (it contains –$CF_2$– groups in the chain). These fluoropolymer backsheets have excellent UV and weather durability, contributing to panels routinely lasting more than 25 years. Industry estimates suggest that most solar panels use a fluoropolymer-based backsheet, with the rest using non-fluorinated alternatives.[36] It's important to stress that the fluoropolymers in backsheets are highly stable polymers bound into the panel structure and not loose toxic chemicals that would easily leach out.
3. **Wires and cables:** High-performance wire insulation can be made of PFAS polymers (e.g., PTFE tape for wire wraps, FEP or ETFE insulations) due to their heat resistance. In a solar installation, the module's junction box and cables might contain these materials. However, the presence of a Teflon-insulated wire or a fluoropolymer gasket in a junction box is not unique to solar – the same materials are found in many electrical products. These components are small and encapsulated; they would not present a pathway for PFAS to leach under normal conditions.[18]
4. **Encapsulants and sealants:** PV cells are usually encapsulated in polymers like EVA (ethylene–vinyl acetate) or polyolefin, and edge sealants are used to laminate the module. These are generally hydrocarbon-based plastics, not fluoropolymers. PFAS are not typically used in solar encapsulant or sealant formulations, according to industry product data. Silicone adhesives and butyl rubber are common, and they achieve weather-tight sealing without needing PFAS. Some industrial adhesives (like certain carpentry glues or

specialty tapes) do contain PFAS, but those are not what PV manufacturers use for module lamination.[36]

In summary, yes, some solar panels incorporate fluoropolymer materials, especially in backsheets and possibly in minor components, because these materials confer durability and longevity. But these are solid, inert polymers, often considered polymers of low concern, and very different from the soluble PFAS that contaminate groundwater.[27] For end-of-life PV modules with fluorinated backsheets (e.g., PVF/PVDF laminates), the potential for fluorinated byproduct formation during disposal (say incineration) is highly dependent on combustion conditions. Well-controlled high-temperature incineration with effective flue-gas treatment largely degrades and captures fluorinated species, whereas informal burning increases the risk of incomplete breakdown and harmful emissions.[37]

Also, not all solar panels use fluoropolymers. There are non-fluorinated backsheets (for instance, those made of all PET or other plastics), and even glass/glass module designs that eliminate the backsheet entirely. Notably, several European solar manufacturers have recently introduced PFAS-free solar panels as a selling point. Companies like Solarge (Netherlands) and Energyra advertise that their solar panels contain "no fluorine compounds", using alternative backsheets and soldering techniques.[38] These panels are both fully recyclable and avoid any PFAS-related concerns in the bill of materials. The market for PFAS-free backsheets is growing; roughly 20% of new panels in 2022 used non-PFAS outer layers, and that share is expected to rise as innovation continues.

To responsibly assess the environmental and health risks associated with PFAS in solar panels, further research is needed to clarify the fate and transport, bioaccumulation potential, and toxicity of specific PFAS compounds involved. Not all fluorinated compounds behave the same in the environment, and risk depends on factors such as their mobility, persistence, and potential to bioaccumulate.[39,40] Therefore, before drawing broad conclusions about PFAS toxicity in solar panel applications, it is essential to thoroughly investigate the specific compounds used, their quantities, and their behavior throughout the product lifecycle.

## What does the literature say about the use of PFAS in solar panels?

Given that some solar panels do contain fluoropolymers, an important question is whether these substances could escape and pose environmental harm. This is where the distinction between polymeric PFAS and other PFAS becomes critical. To evaluate the presence of PFAS in solar panels, we conducted a systematic literature review, published separately as a journal article.[40] The comprehensive literature review on PFAS in solar panels found plenty of speculation and laboratory trials of PFAS in solar applications, but no confirmed reports of PFAS contaminants leached from real, commercially deployed solar panels. For instance, the review noted that some academic papers and patents have explored using fluorinated coatings or additives in experimental solar cells, but there was no evidence that such methods had been adopted in mass-produced panels.[40]

In 2018, an EPA scientist compiled 39 records of PFAS usage related to solar panels[33] largely from a SciFinder literature search. Those records indeed showed various PFAS (mostly fluoropolymers or processing chemicals like GenX) being used in solar manufacturing research. However, when pressed on whether actual solar panels contain GenX or other PFAS, the EPA scientist could not confirm any specific products or ongoing investigations.

In other words, PFAS-related chemistries may be used upstream in manufacturing certain PV components (e.g., for example, fluoropolymer film production can involve fluorinated processing aids such as Chemours' GenX technology), but this does not imply that mobile PFAS are present in the finished solar panel at levels that would leach under normal use.[40] Manufacturers design these processes so that processing aids enable polymerization and are not intended to remain as free, extractable compounds in the final material; instead, the end product is a chemically stable fluoropolymer. For example, Chemours produces fluoropolymer films for solar panels, and while a processing aid like GenX is used to make the Teflon, the finished film is essentially pure PTFE/FEP polymer.[36] Likewise, some PV backsheets use PVDF-based materials, such as Arkema's PVDF Kynar homopolymers (CAS 24937-79-9). While PVDF can technically fall under certain broad PFAS definitions because of its fluorinated carbon backbone, it is a PLC in many regulatory discussions and is not listed in the OECD Global Database of PFAS.[25]

## Why has the notion of "PFAS in solar panels" gained so much attraction despite scant evidence?

A major factor is the lack of transparency from PV manufacturers about their material formulations. Solar panels are typically sold as black boxes. Datasheets list electrical performance and maybe general construction (e.g., glass/EVA/PET), but they do not list chemical ingredients. Thus, community members and regulators concerned about PFAS have struggled to get straight answers. In the absence of information, worst-case assumptions take hold. Media reports/news[19,21,41,42] have amplified these concerns. This news often cited the EPA's confirmation that certain PFAS (like the GenX processing chemicals) are used in making solar panel components[43] while acknowledging uncertainty about the implications. Public meetings about solar farm permits now regularly feature questions about PFAS. As a result, several solar projects across the U.S. have faced delays or resistance.[42–44] These concerns have also extended to the development of new solar manufacturing facilities.[21]

## Do solar experts think solar PV contains PFAS?

To explore this, we conducted a survey during the 52nd IEEE PVSC 2024.[45] conference in Seattle, targeting a diverse group of 48 professionals, including module manufacturers, PV researchers, academic scientists, and professionals from operations and maintenance (O&M) backgrounds. The survey posed two key questions: (1) *How likely do you believe that PFAS are used in solar PV?* and (2) *Which solar PV components may contain PFAS?*

The striking insight is that even solar industry experts are not certain about the issue. According to the responses, 59% of participants believed that PFAS use in solar PV is likely (ranging from "slightly" to "extremely"), as shown in Fig. 1a. When asked about potential component-level presence, 54% selected the backsheet, and 39% chose the solar glass coatings (Fig. 1b).

This shows that inside the industry, people suspect PFAS might be involved, but there isn't a clear consensus or knowledge base. It underscores a communication gap: manufacturers may be using fluoropolymers that they consider harmless, yet without openly communicating this, they leave room for doubt and mistrust.

## What other products contain PFAS and pose a greater concern than solar panels?

There are widespread concerns about the potential presence of PFAS in solar panels, but has the public considered how much they are exposed to PFAS from products they use daily? One often overlooked aspect in conversations about solar panels' toxicity is the risk from all other sources of PFAS, which could pose higher risks. PFAS are commonly found in a variety of everyday consumer products, including laptops, mobile phones, food processing equipment, home appliances, non-stick cookware, carpets, and firefighting foams.[46] These products typically involve direct human contact or higher concentrations of PFAS. Multiple studies.[47,48] have documented measurable levels of PFAS in such products, indicating that they may contribute more significantly to aggregate PFAS exposure. For example, fluorotelomer alcohols (FTOHs) and PFOS have been found in textile furniture covers and carpets,[49] which can leach into wastewater systems during washing. These findings suggest that a wide range of consumer products can contribute to PFAS emissions and exposure. In contrast, there is currently no verified scientific evidence confirming the presence or release of PFAS from solar panels. Thus, comprehensive, product-specific PFAS testing is necessary to understand actual exposure risks from solar technologies compared to other common sources.

Going forward, an industry-wide adoption of PFAS-free product labeling or material disclosure declarations (similar to RoHS or REACH compliance statements) could preemptively address public concerns. Encouragingly, some companies have begun to do this. In late 2024, Boviet Solar obtained a third-party certification that its solar panels are free from harmful PFAS.[50] This kind of voluntary disclosure helps reassure customers and regulators. Solar energy advocates and environmental scientists alike should push for this openness. After all, if the vast majority of panels truly pose minimal PFAS risk, the data should bear that out and be shared. And if a few products do contain worrisome PFAS additives, those can be identified and phased down or replaced.

## Research gaps related to PFAS in photovoltaic technologies

Despite increasing attention to the potential presence of PFAS in photovoltaic (PV) components, several important knowledge gaps remain. First, there is limited systematic characterization of PFAS occurrence and concentrations in different PV technologies and components. Existing studies are sparse and often focus on total fluorine rather than compound-specific PFAS identification, creating uncertainty regarding which PFAS species may be present and in what quantities. Second, data are lacking on PFAS release mechanisms across the PV life cycle, including during long-term outdoor weathering and end-of-life management. Third, little is known about the formation of PFAS transformation products under high-temperature or chemical processing conditions, which may differ in toxicity and mobility from parent compounds.

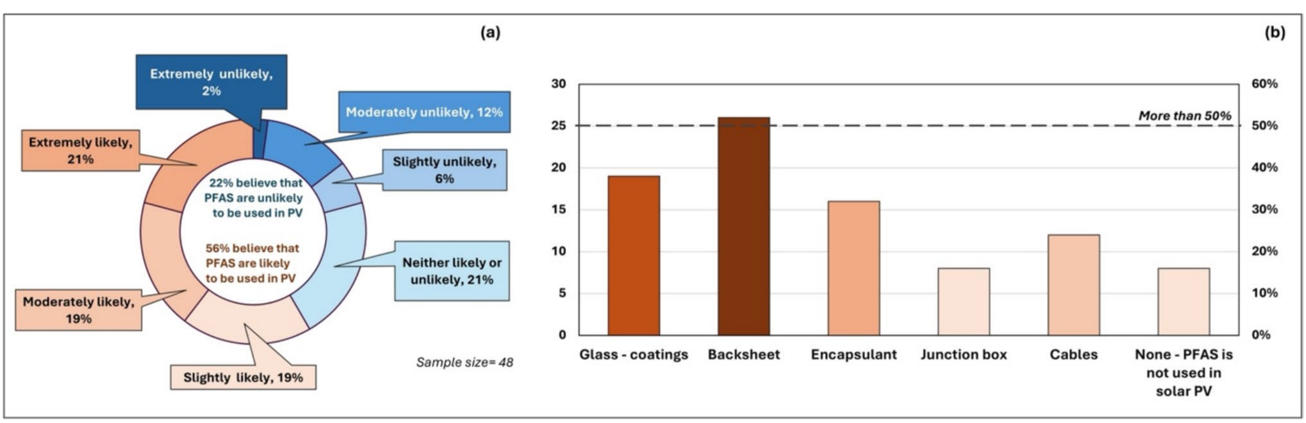


**Figure 1.** Survey results from 48 solar PV professionals, including module manufacturers, R&D experts, and O&M professionals: (a) perceived likelihood of PFAS use in solar PV, and (b) perceptions of which solar PV components may contain PFAS. These results represent expert perceptions and not confirmed chemical evidence; the responses highlight the existing uncertainty and lack of transparency in PV material composition.

### *Responsible path forward: research and action*

Even though current evidence doesn't show a PFAS release problem from solar panels, the issue should not be dismissed outright. Instead, it should be approached with scientific rigor and proactive policy. Here are some recommended steps to ensure the PFAS issue is managed without hindering solar progress:

1. **Improve material disclosure**: Solar manufacturers should clearly disclose the presence of any PFAS-related materials in their panels. This could be achieved via industry standards or certification programs (similar to Environmental Product Declarations). Knowing whether a panel's backsheet is PVDF or a fluorine-free PET, for example, would help stakeholders assess any potential risk. Transparency will build trust and head off misinformation.
2. **Adopt safer alternatives where feasible**: The industry should continue its trend toward PFAS-free components. Durable non-fluorinated backsheets and coatings are already on the market. For instance, multi-layer PET films and other polymer blends can often substitute for PVDF backsheets. By gradually shifting to PFAS-free designs (or glass/glass modules), manufacturers can eliminate even the perception of a problem. Importantly, this shift should be prioritized for panels destined for sensitive locations, such as near wetlands or water supplies, to alleviate community fears.
3. **Targeted testing and research**: While broad testing of every solar panel for hundreds of PFAS would be costly and likely unnecessary, focused research can address key knowledge gaps. For example, independent labs or academic groups could take samples of representative panels (especially older models or those suspected of containing fluoropolymers) and analyze them for any leachable PFAS. Standardized methods may need development since existing PFAS tests are geared toward water, not solid electronics. If such studies confirm what we suspect (that essentially no PFAS of concern leach out), that data should be published in open-access literature to put the issue to rest. If, on the other hand, any PFAS are detected from panels under extreme conditions, that would identify a specific problem to solve (e.g., replacing a particular component or improving waste handling).
4. **Emphasize end-of-life management**: The stage at which PFAS in solar panels would be most likely to cause harm is end-of-life, especially if solar panels are improperly disposed of, such as incinerated. Incinerating fluoropolymers at inadequate temperatures could create harmful fluorinated emissions. Landfilling broken panels, if they contain any small PFAS, could, in theory, allow leaching. Therefore, strengthening solar panel recycling programs and proper disposal protocols is a wise investment regardless of PFAS. Many U.S. states are already developing PV module recycling requirements, and these should include guidance for handling any fluorinated plastics safely.
5. **Keep risks in perspective:** Regulatory agencies formulating PFAS policies should avoid inclusion of solar panels in the same category as PFAS-laden consumer goods or firefighting foams. Any actions (such as bans or hazardous classifications) should be evidence-driven. Blanket class regulations that fail to distinguish polymers from persistent mobile PFAS could unintentionally undermine clean energy deployment. For instance, if a broad PFAS ban outlawed PVDF film without exemption, it could disrupt module production for little gain, given that PVDF is non-leaching and non-toxic in use. Policymakers should instead pursue smart measures: require disclosure, support PFAS-free innovations, and address confirmed problematic uses of PFAS first (like firefighting foams or coatings that actually release PFAS). Solar panels have a crucial role in decarbonizing the energy sector, and over-regulating them based on unsubstantiated fears would be counterproductive to climate goals.

If solar panels contain PFAS, the key questions that must be addressed are: "*Which specific PFAS compounds are used, in what quantities, in which PV components, how they are applied, and in what chemical form?*" Without clear answers to these questions, it is premature to claim that solar panels pose a meaningful risk of PFAS leaching.

### *Solar panels as part of the PFAS solution?*

Amid the discussion of potential harms, it's worth flipping the script: can solar PV technology help with PFAS remediation? While solar panels themselves don't break down PFAS, deploying solar farms can enable creative risk mitigation for PFAS-contaminated lands. A prime example comes from Maine. In 2023, Maine passed legislation (LD 1591) specifically to promote building solar projects on farmland that had been rendered unusable by PFAS pollution.[51] These are lands where decades of sludge fertilizer use left soil and water tainted with "forever chemicals," making farming untenable. By covering such sites with solar arrays, Maine aims to achieve multiple benefits: support the affected farmers with new income, advance clean energy goals, and prevent further disturbance of contaminated soil.[52]

Solar installations essentially cap the land–panels and racks sit atop the ground without needing to excavate much, thereby reducing erosion or spread of PFAS-laden dust. This approach does not destroy PFAS, but it allows the land to be productively used while scientists work on long-term remediation technologies. Similar ideas are now being considered elsewhere, as regulators realize that outright digging and hauling of PFAS-contaminated soil are extremely expensive and risky. Solar farms on brownfields or PFAS-affected areas can be a win–win strategy: contain the contamination and generate clean power at the same time.

## Conclusion

The conversation about PFAS in solar panels needs to be grounded in scientific evidence and context. Based on all available information today, the typical solar panel does not appear to pose a PFAS risk. Yes, some panels use fluoropolymers, but these are generally stable materials unlikely to leach, and no monitoring data have identified solar installations as PFAS pollution sources. In contrast, many everyday products around us do shed PFAS and contribute far more to human exposure. This does not mean we ignore the issue–rather, we should verify and ensure that as the PV industry grows, it does so in a way that avoids any PFAS problems from the start.

By demanding transparency, supporting PFAS-free alternatives, and basing decisions on empirical data, we can address public concerns without slowing the transition to clean energy. There is already promising movement in the right direction: manufacturers obtaining "PFAS-free" certifications, policymakers incentivizing PV projects on contaminated lands, and researchers providing clear, fact-based outreach on the topic (like this article).

The onus is on both industry and the scientific community to keep building this knowledge. If future testing does find any PFAS in panels that need attention, those should be dealt with promptly and openly. Until then, it's fair to say that the specter of solar panels as a PFAS menace is more myth than reality–and that myth should not overshadow the very real environmental benefits of solar PV technology. By staying vigilant and proactive, we can ensure that solar PV remains a cornerstone of sustainable development without unintended chemical legacies.


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## Disclaimer

Any opinions, findings, conclusions, or recommendations expressed in this material are those of the author(s) and do not necessarily reflect the views of the National Science Foundation.

## Author contributions

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## Data availability

No experimental or analytical datasets were generated. Survey data are summarized in the manuscript.

## Declarations

### Competing interest

The authors declare that they have no known competing financial interests or personal relationships that could have appeared to influence the work reported in this paper.



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