

## Opening Statement for Legislative Committee Hearing on PIPV

Chair, Vice Chair, and Members of the Committee:

My name is Ken Boyce. I am the Vice President, Engineering for the Industrial Testing, Inspection and Certification division at UL Solutions. I am an electrical engineer by training, and I've been with UL for over 40 years. Many of you may know UL Solutions by its former name, Underwriters Laboratories

Underwriters Laboratories was founded in 1894, created to test electrical products after a fire at the 1893 Chicago World's Fair highlighted serious safety risks. Today, UL Solutions is a leading global safety science company. Through testing, inspection, certification, verification, and related services we help manufacturers and businesses demonstrate compliance with safety, security, and sustainability standards.

Thank you for the opportunity to speak with you today about plug-in photovoltaic systems, often referred to as PIPV.

UL Solutions appreciates the growing interest in PIPV technology as a way to expand access to solar energy, particularly for renters and households that are unable to install rooftop solar. We share that goal. However, our mission—working for a safer world—requires us to look carefully at how new technologies interact with existing electrical systems and the people who will use them, and whether they do so safely.

UL Solutions' work on PIPV was prompted by the passage of Utah bill HB 340. The Utah law allows PIPV systems to be exempted from interconnection standards if the systems conform to standards in the National Electrical Code (NEC, ANSI/NFPA 70) and are certified by Underwriters Laboratories. At that time though, there was no standard to which these systems could be certified, nor specific code requirements that apply to PIPV.

To address this gap, our engineers conducted a detailed technical review of PIPV systems and identified several unintended but serious safety hazards. These hazards span both the PIPV products themselves, and how the PIPV products can introduce hazards into the residential wiring systems.

First, **overcurrent risk**. In a typical U.S. home, branch circuits are protected by circuit breakers located at the main electrical panel. A plug-in PV system injects current downstream of that panel. When that injected current combines with utility-supplied power, it can exceed the safe capacity of the branch circuit conductors—without being detected by the circuit breaker. That creates a real risk of overheating, electrical fires, and shock.

Second, **ground-fault circuit interrupter, or GFCI, compatibility**. GFCIs are required in bathrooms, kitchens, outdoors, and other areas where people are more vulnerable to electrical shock. These devices are designed for one-directional current flow. Plug-in PV systems introduce bidirectional current, which can damage or impair GFCIs, potentially slowing their response—or preventing them from tripping at all—during a ground fault. These products could continue to provide power but not be able to protect the public.

Third, **touch safety**. While existing inverter standards like UL 1741 focus on grid-interactive performance, they were not written to address the unique human-exposure risks associated with consumer-accessible plug-in systems. Without additional safeguards, both the AC and DC sides of a PIPV system could expose users directly to electric shock hazards .

In response to these findings, UL Solutions developed **UL 3700**, a comprehensive set of technical requirements specifically designed to address PIPV safety concerns. UL 3700 covers system design, performance, installation instructions, mounting durability, and—critically—how these systems interact with existing residential wiring.

UL 3700 allows for different pathways to mitigate these hazards. Among other protections, UL 3700 requires:

- Practical methods to ensure that PIPV systems can only connect to circuits designed to safely handle the injected current.
- **Verified compatibility with bidirectional GFCIs**, maintaining the high level of shock protection Americans have come to expect.
- **Rigorous touch-safety requirements** across all system components.
- **Mechanical and environmental testing** to ensure mounting hardware does not fail and injure someone below.

These protections are not arbitrary. They are an extension of the same safety principles that have driven dramatic declines in residential electrical injuries and fatalities over the past several decades. For example, expanded GFCI requirements since the 1970s have reduced consumer-product electrocutions by more than 90 percent. New technologies must respect—and not bypass—these proven protections.

We are often asked why plug-in solar systems used in Europe cannot simply be adopted in the United States. The answer is that our electrical systems, building stock, and safety requirements are fundamentally different. U.S. codes are intentionally more conservative, particularly to protect children, the elderly, and other vulnerable populations. Even at lower

wattages, plug-in PV systems present the same fundamental hazards if they circumvent established protective devices.

For these reasons, UL Solutions strongly supports legislation that allows PIPV to move forward only with appropriate safety certification, including certification to UL 3700. This approach protects consumers, provides clarity to manufacturers, and enables innovation without compromising the electrical safety framework that has served this country well.

Thank you for the opportunity to share our perspective. I look forward to your questions.