UL Standards & Engagement

# Safety in the Future of Electrification

UL Standards & Engagement (ULSE) focuses electrification safety on products and systems utilizing rechargeable energy storage devices (and systems), stationary or mobile, aimed at supporting energy demands and replacing technologies traditionally powered by fossil fuels.

**Electrification addresses the following:**

- All aspects from components to entire systems
- All associated equipment required for charging and discharging
- Industrial and consumer uses
- Less carbon-intensive electricity generation
- Horizontal battery requirements (e.g., common battery safety requirements associated with end products)


**Batteries** are the foundational component for many electrification applications. Secondary (rechargeable) batteries can be charged and discharged a multitude of times during their life cycle. Batteries can consist of single cells, packs or modules, and associated management systems. Batteries are utilized in applications ranging from electric vehicles (EVs), e-bikes, solar, and energy storage.

## In addition to batteries, other key elements of electrification include the following:

### 1 Charging

The process of charging a secondary battery cell, pack, or module. This includes all equipment required to make an electrical connection between a source and an output device, such as electric vehicle supply equipment, with the intention of transferring stored electrical energy.

### 2 E-Mobility

Electromobility—also known as e-mobility—is the principle of using electric propulsion for a wide range of transportation types. This ranges from e-bikes, hoverboards, e-scooters, EVs, and larger commercial or industrial applications.

### 3 Energy Storage Systems (ESS)

An ESS consists of one or more components working together to store energy and supply electrical energy when needed. These systems can be electrochemical, chemical, mechanical, or thermal.

### 4 Photovoltaic (PV)

Photovoltaic cells, also referred to as solar cells, convert sunlight directly into electricity. PV cells are commonly arrayed in panels used in various applications to generate clean, renewable electrical energy.

### 5 Wind

Wind power is a sustainable and renewable energy source that is generated using wind turbines. The energy produced is transferred to the connected ESS or electrical grids.

### 6 Electrical Grids

An interconnected distribution network typically used to bridge utilities or other energy producers to consumers, allowing the delivery of electrical energy. Electrical grids vary in size and can cover whole countries or continents.