

## Host Utilities



Co - Host Utilities



## ORGANIZER



# India SMART UTILITY Week 2024

## Supporting Ministries



## Session 1: Emerging Smart Energy Technologies and Standardization Landscape

### Emerging technologies and standards for safe Grid integration

*Presented By*

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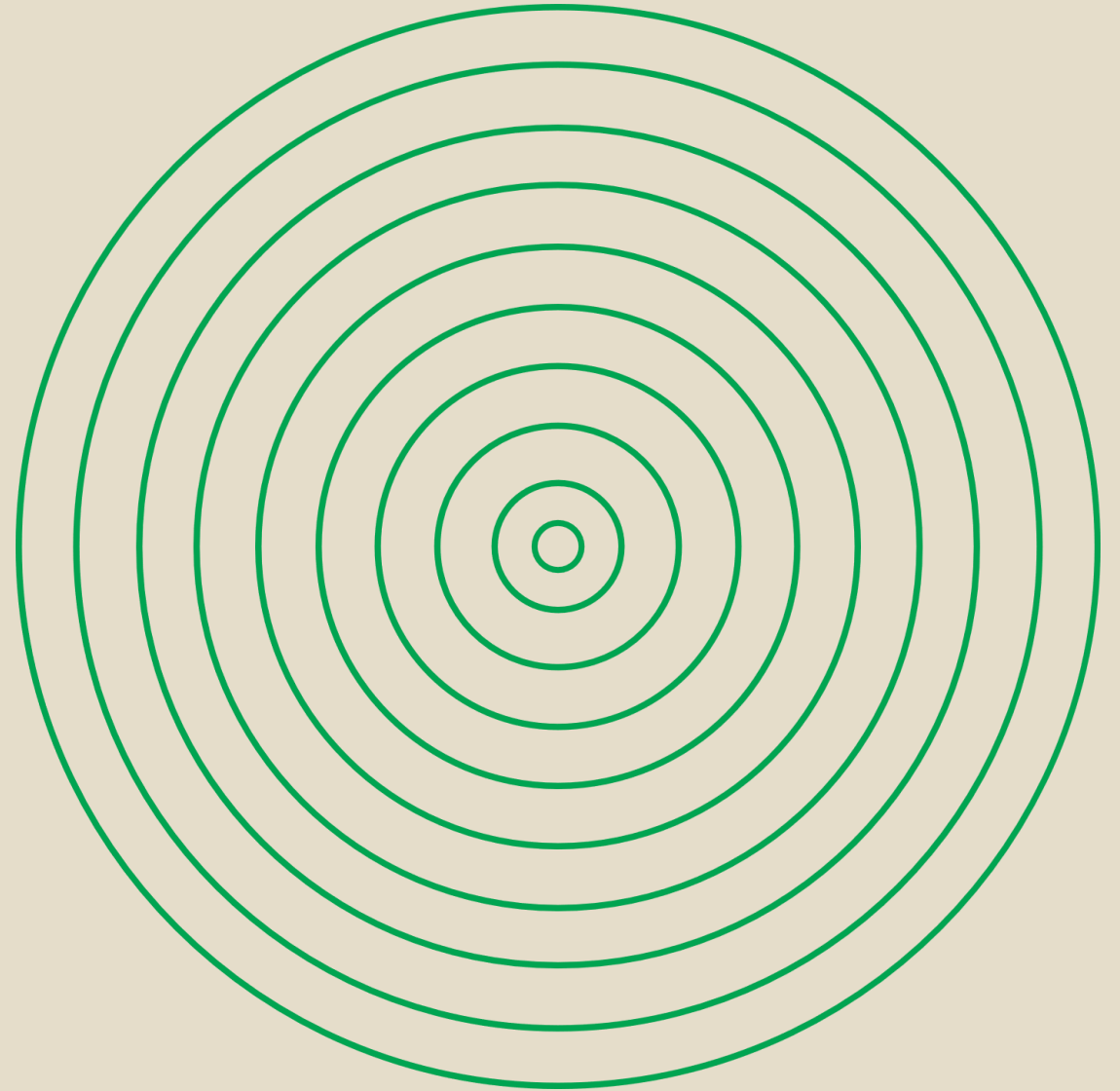


@indiasmartgridforum

# Agenda

1. An introduction to UL Standards & Engagement (ULSE)
2. Emerging technologies landscape
3. Standards for Safe and Secure Grid integration
4. Recommendations for '*Surakshit grid*'

# Introduction to ULSE



Three organizations.  
One shared mission.  
**Working for a safer  
world.**



**Research  
Institutes**



**Standards &  
Engagement**



**Solutions**

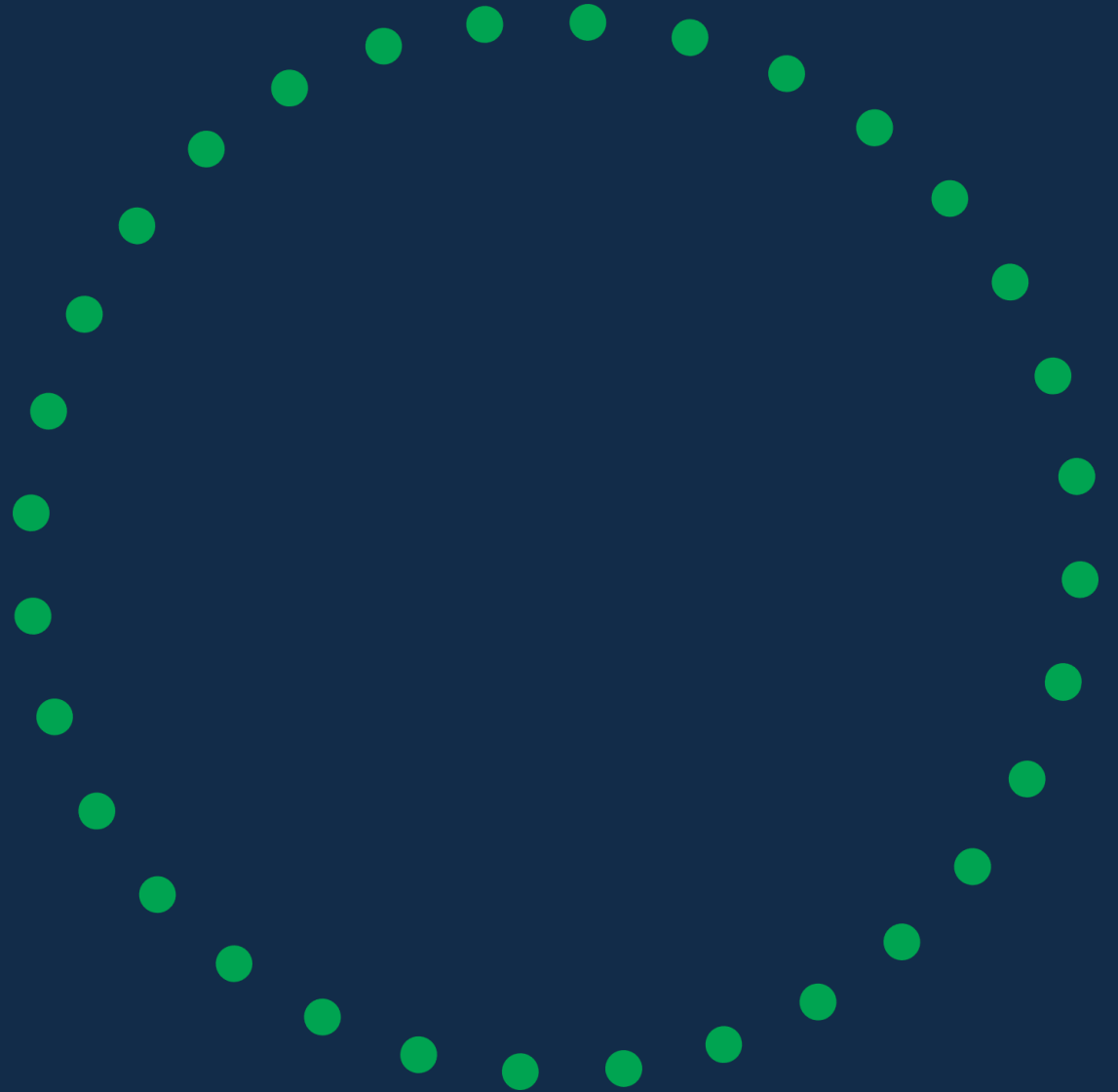
# UL Standards & Engagement: Working for a Safer World

**UL Standards & Engagement** is a global, nonprofit standards development organization (SDO).

- Multidisciplinary approach to developing and updating standards that address safety, security and sustainability issues
- Global reach and local representation
- First Standard published in 1903
- SDO Accredited by American National Standards Institute (ANSI), Standards Council of Canada (SCC) to develop national standards
- DGN Recognized SDO in Mexico to develop national standard



# Emerging technologies landscape





# Emerging technology areas

## Safe – Secure – Sustainable

### Decarbonization:

#### **1** Clean Energy Generation

- Solar
- Wind
- Hydro

### Grid integration

#### **2** Distribution & Transmission;

- Security;
- Interoperability
- Cyber security

### Reliable

#### **3** Energy Storage Systems

### Smart

#### **4** Smart built environment

#### **5** Electrified Transportation

- V2V
- V2G
- V2H

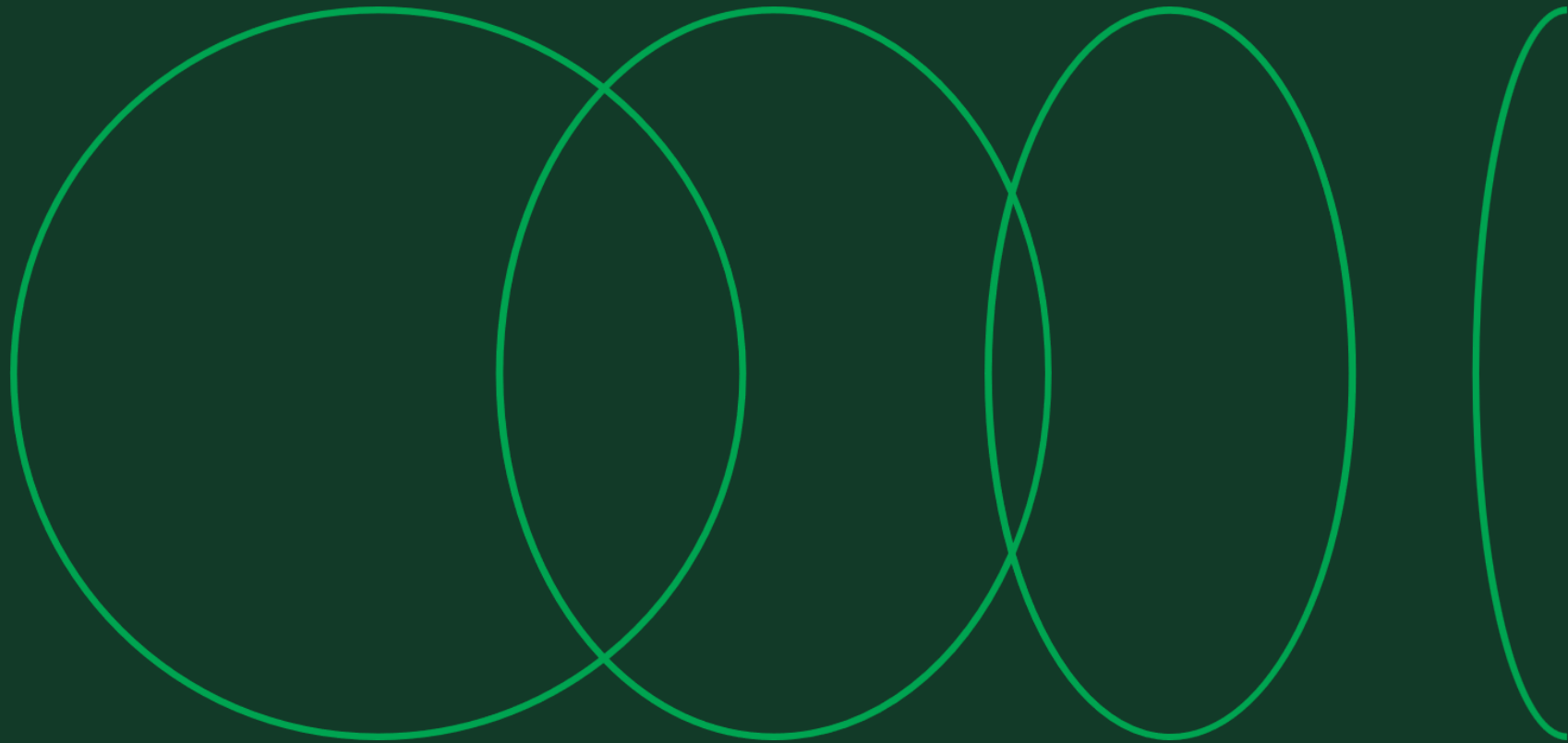
### Sustainable

#### **6** Circular Economy;



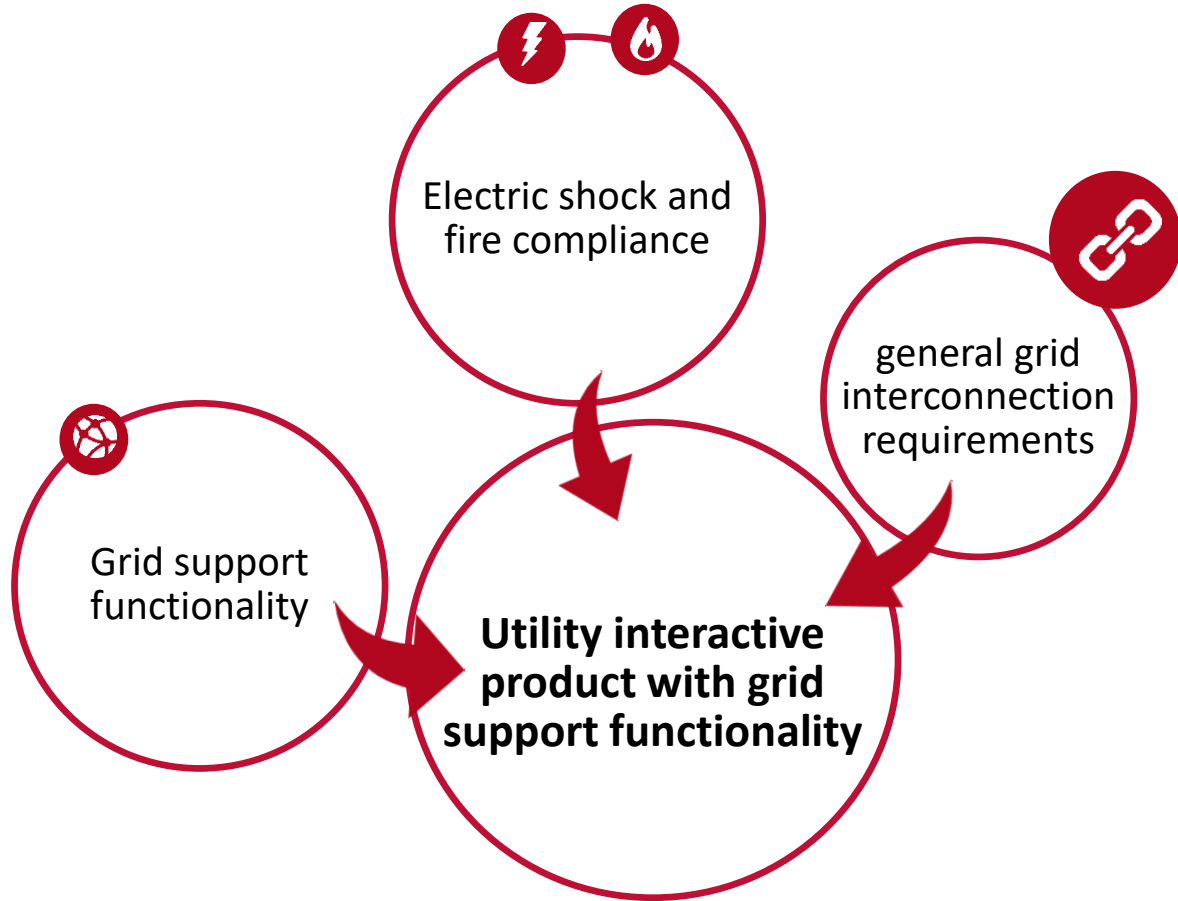
# Smart grid

Challenges and standards



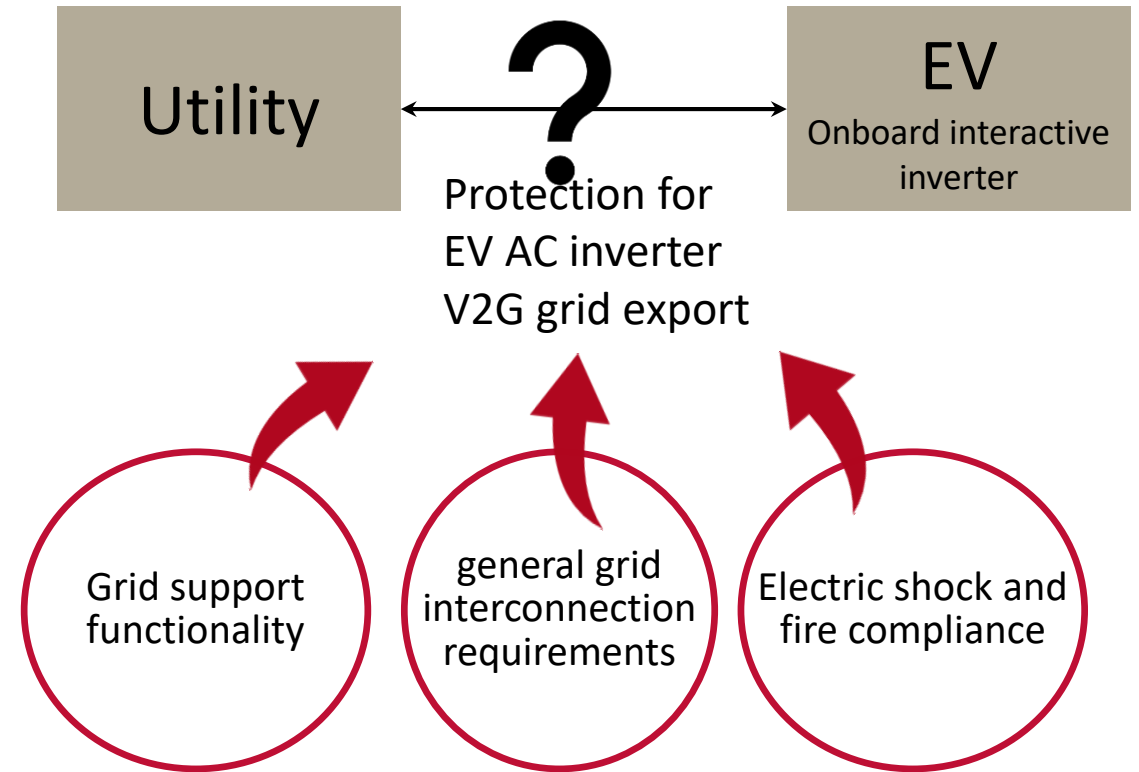


# Safety challenges Utility Interactive Products

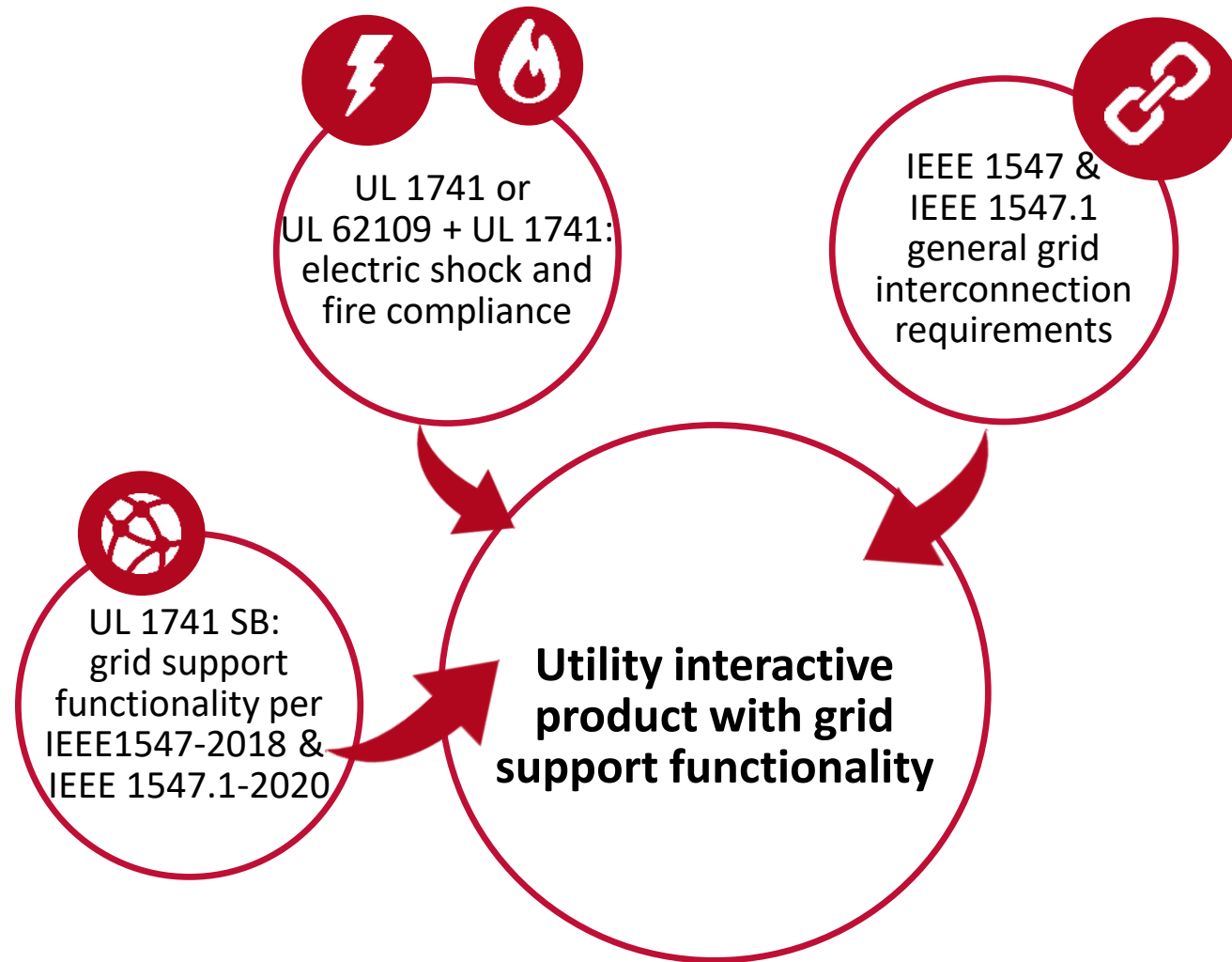


Needs system approach covering all types of generation

# Safety challenges - BEVSE/ISE for EV AC V2G applications

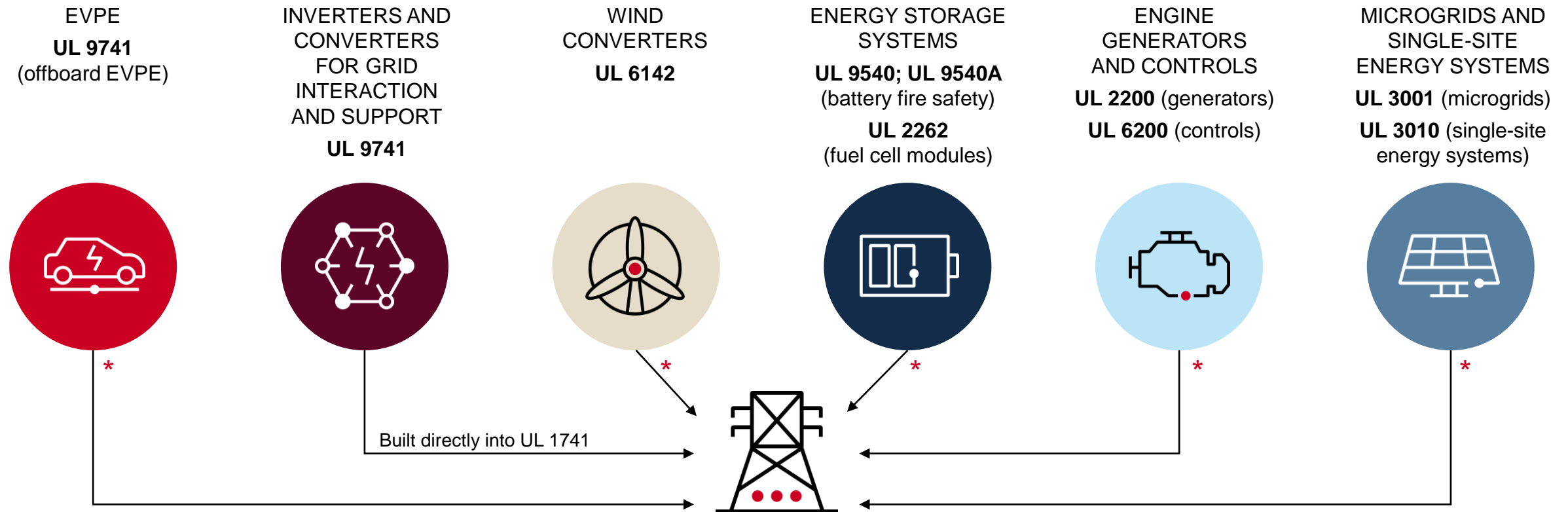


# Standards to address Safety challenges Utility Interactive Products



# DER safety standards and relationship to utility interconnection standards

A variety of DER safety standards refer to UL 1741 for utility-interactive requirements



## UTILITY INTERCONNECTION STANDARDS

UL 1741 SB – IEEE 1547 (2018), IEEE 1547.1 (2020)

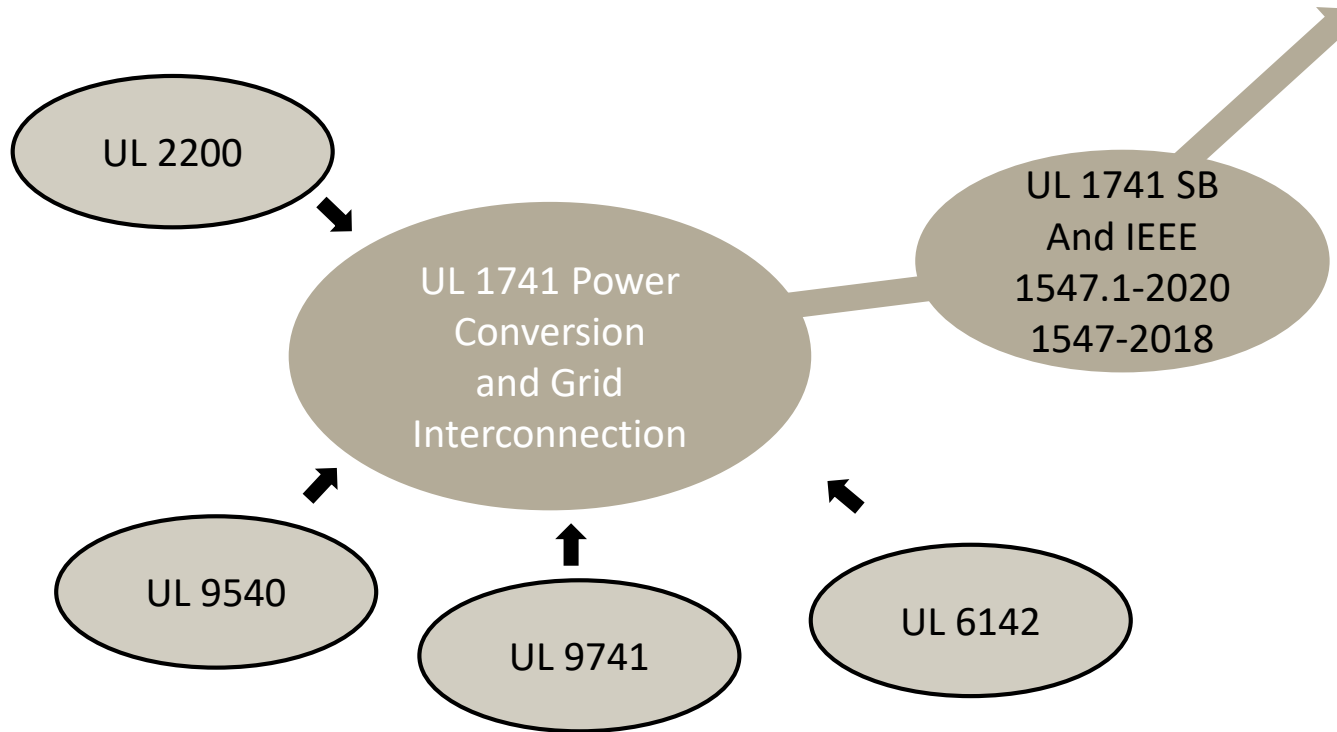
UL 1741 SA – Configured with an SRD, e.g. Rule 21, 14H, etc.

UL 1741, Section 40 – IEEE 1547 and 1547.1 (earlier editions)

# Standard for safe – secure interactive smart grid.

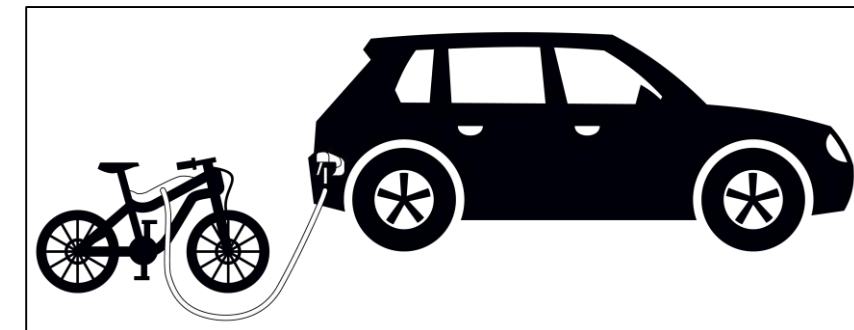
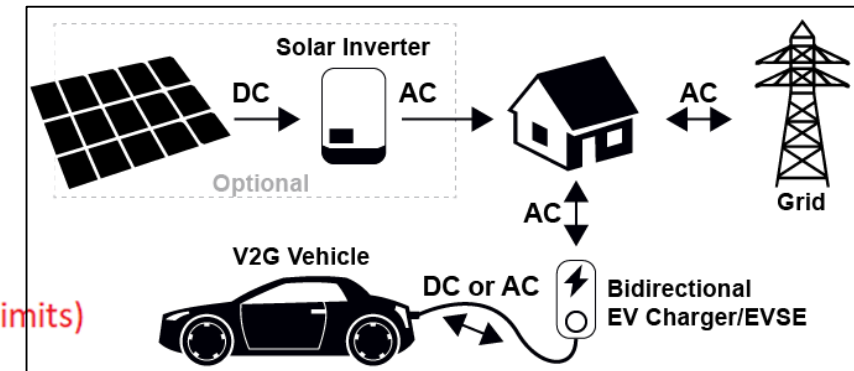
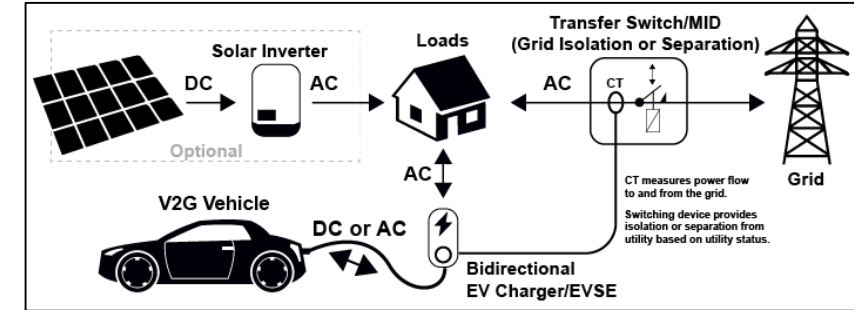
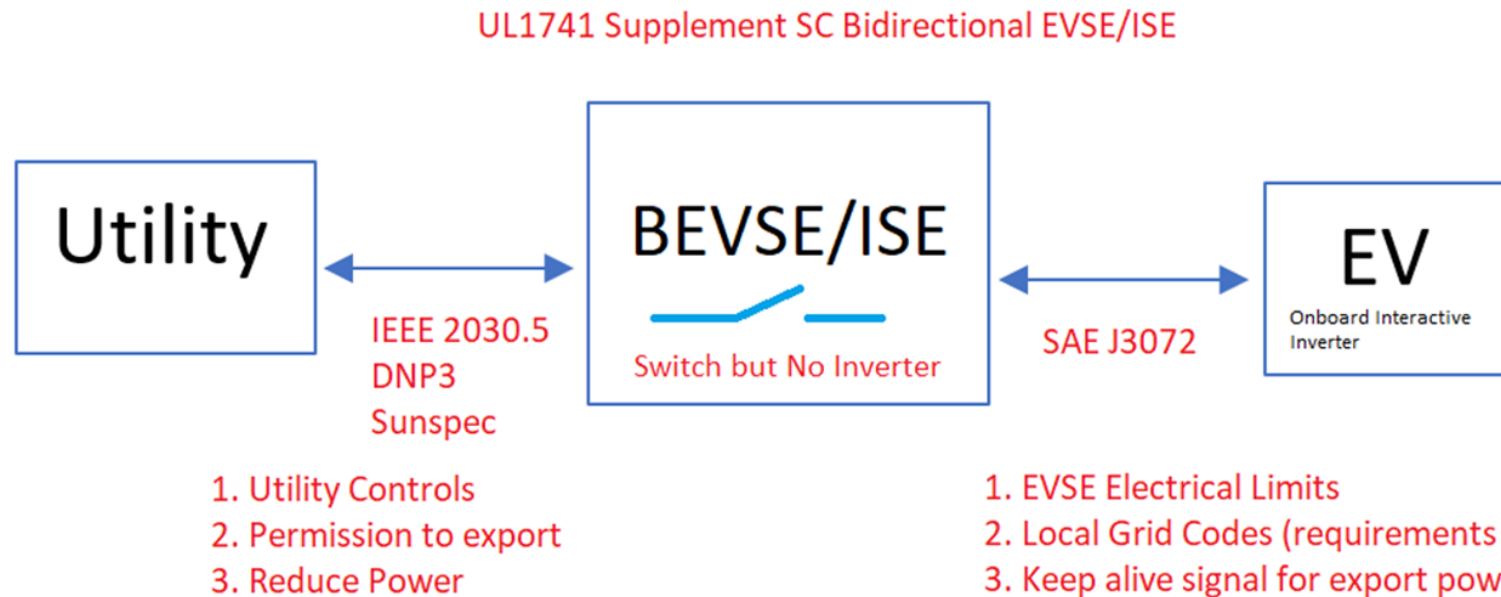
## UL 1741 Supplement SB (30 pages)

References IEEE 1547-2018 and IEEE 1547.1-2020 performance standards to evaluate grid support utility interactive products.



UL 1741 – SB is developed by task group: national labs, electric utilities, inverter mfrs, DER mfrs, NRTLs and general interest STP members.

# Standards for Safe and Secure BEVSE/ISE for EV AC V2G applications



# KEY TAKEAWAYS / RECOMMENDATIONS

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1. Holistic system approach: safety - security - sustainability
2. Global harmonization of standards
  - Complete adoption
  - Adoption with national difference
  - Adapt standards as local relevance
  - Active participation in consensus based standard development

# THANK YOU

*For discussions/suggestions/queries email: **Manjunath.V@ul.org***  
*visit: <https://ulse.org/>*