



सत्यमेव जयते

भारत सरकार/ Government of India
विद्युत मंत्रालय/ Ministry of Power
केन्द्रीय विद्युत प्राधिकरण/Central Electricity Authority
ग्रिड प्रबंधन प्रभाग/Grid Management Division

सं.: 12/एक्स/एस.टी.डी.(सी.ओ.एन.एन)/जी.एम./2023/

दिनांक: 15.05.2023

विषय: दिनांक 10.05.2023 (बुधवार) को अपराह्न 03:00 बजे सदस्य (जी ओ & डी), सीईए इलेक्ट्रिक वाहनों की बैटरियों से ग्रिड की रिवर्स चार्जिंग पर दिशा-निर्देश तैयार करने से संबंधित मुद्दों में आयोजित बैठक का कार्यवृत्त ।

Minutes of the Meeting held on 10.05.2023 (Wednesday) at 03:00 PM under the Chairmanship of Member(GO&D), CEA to frame guidelines on reverse charging of grid from batteries of EVs

सदस्य (जी ओ & डी), सीईए की अध्यक्षता में दिनांक 10.05.2023 (बुधवार) को अपराह्न 03:00 बजे आयोजित बैठक के कार्यवृत्त आपकी जानकारी एवं आवश्यक कार्यवाही हेतु संलग्न है। यह पत्र सक्षम अधिकारी द्वारा अनुमोदित है।

Please find enclosed the minutes of the meeting held under Chairmanship of Member(GO&D) on 10th May 2023 at 03:00 PM. It is issued on approval of Competent Authority.

संलग्नक: यथोपरि।

(चंद्र प्रकाश)
(मुख्य अभियन्ता एवं सदस्य सचिव)

बैठक के सभी प्रतिभागियों को ई-मेल द्वारा प्रेषित

Minutes of the 1st Meeting held on 10.05.2023 (Wednesday) at 03:00 PM under the Chairmanship of Member (GO&D), CEA to frame Guidelines on Reverse Charging of Grid from batteries of EVs

Member (GO&D), CEA, the Chairperson of the committee to frame Guidelines for Reverse Charging of Grid from batteries of Electrical Vehicles (EVs) welcomed the participants from IIT Bombay, Bureau of Energy Efficiency (BEE), GRID India, Central Transmission Utility of India Limited (CTUIL), TATA Power, NTPC Vidyut Vvyapar Nigam Ltd (NVVN), and BSES Rajdhani Power Limited (BRPL) to the meeting. The list of the participants is enclosed at **Annexure-I**.

2. With the permission of the chair, Chief Engineer (GM), CEA gave a brief presentation on the issues for discussion in the meeting. The copy of the same is enclosed at **Annexure-II**.

3. Chief Engineer (GM), CEA stated that MoP vide O.M. dated 20th March, 2023 requested CEA to frame guidelines for Reverse Charging of Grid from batteries of EVs. Accordingly, a Committee was constituted under the Chairmanship of Member (GO&D), CEA vide letter dated 11th April, 2023. He further stated that the storage capacities available with the EVs may be utilized for the purpose of balancing requirements of the Grid to begin with. This would obviate the need for Storage Capacity/ BESS resulting in savings of huge amount of money. This also aligns with our national goal of reaching net zero emission by 2070. However, all these benefits come with their own set of challenges like Battery economics, technical feasibility, Grid Security issues and Customer willingness which are to be looked upon while formulating these guidelines. It was also mentioned that currently various protocols for reverse charging are under development.

3. Dr. Anil Kulkarni, IIT Bombay stated that the concept of Reverse Charging has started in Australia but it is still in nascent stage. Being a new concept globally, while implementing it in our country we have to start with a pilot project within broad guidelines which could be fine-tuned with the experiences gained by these pilot projects.

4. Director (Distribution Planning & Technology), CEA suggested that the Reverse Charging Station should be centralised as they can be monitored with ease. Apart from this, primarily Heavy EVs like buses, trucks etc. should be used first for Reverse Charging of Grid before going towards light vehicles. He further added that we need to study the kind of harmonics that might be injected by the Reverse Charging into the grid as it might amplify the existing harmonics present in the distribution lines.

5. The representative of Tata Power stated that the EVs currently on road are not compatible for Reverse Charging of Grid and it needs to be upgraded. He suggested that the representatives from EVs manufacturers and EV Charger manufacturers may be invited in the meeting for their views.

6. Dr. Anil Kulkarni, IIT Bombay stated that the IEEE Standard 1547 can be looked into although not directly related with the current discussion but some aspects can be considered while preparing broad guidelines regarding V2G, as it is related to harmonic injection from Distributed Generators.

7. Chief Engineer (R&D), CEA stated that the technical aspects along with communication is very important for flow of electricity from Vehicle-to-Grid. He also stated that we can stimulate various interaction parameters in an emulator.

8. Member (GO&D), CEA thanked all the participants for active participation and emphasized that this is an evolving subject and need detailed discussions. He directed that a group comprising members from CEA, IIT Bombay, Tata Power, BRPL and EVs and Charger OEMs may analyse the various aspects of reverse charging from EVs and present it before this committee.

The meeting ended with thanks to the chair.

Annexure-I

List of participants in the meeting on 10/05/2023 at 03:00 PM

Central Electricity Authority (CEA)

1. Sh. B.K. Arya, Member (GO&D)
2. Sh. Chandra Prakash, Chief Engineer (Grid Management)
3. Sh. Goutam Ghosh, Chief Engineer (Financial & Commercial Appraisal)
4. Sh. Irfan Ahmad, Chief Engineer (Power Data Management)
5. Sh. Surata Ram, Chief Engineer (Renewable Technology and Integration)
6. Sh. Vivek Goel, Chief Engineer (Distribution Planning & Technology)
7. Sh. Praveen Kamal Mishra, Director (Distribution Planning & Technology)
8. Sh. Himalaya Shubham, Deputy Director (Grid Management)
9. Sh. Sandeep Kumar, Deputy Director (Grid Management)
10. Smt. Bhoomika Banga, Deputy Director (Financial & Commercial Appraisal)
11. Sh. Shubhender Singh, Assistant Director (Grid Management)
12. Sh. Sakil Ahmad, Assistant Director (Grid Management)
13. Sh. Dhruv Kawat, Assistant Director (Grid Management)
14. Sh. Sakil Ahmad, Assistant Director (Grid Management)
15. Sh. Shubam Kumar Singh, Assistant Director (Grid Management)

Bureau of Energy Efficiency

1. Sh. Sameer Pandita, Director

IIT Bombay

1. Sh. Anil Kulkarni

GRID India

1. Sh. K Muralikrishna, ED (Corp. Eng.) & CISO

Central Transmission Utility of India Limited (CTUIL)

1. Sh. Rajesh Kumar, GM

TATA Power

1. Sh. Nilesh Kane, Chief Distribution, Mumbai Operation

NTPC Vidyut Vvyapar Nigam Ltd (NVVN)

1. Sh. Ajit Kumar Bishoi, CEO
2. Sh. Anil Kaushik
3. Sh. DD Sharma

BSES Rajdhani Power Limited (BRPL)

1. Sh. Pradeep

Reverse Charging of Grid from batteries of EVs

Introduction

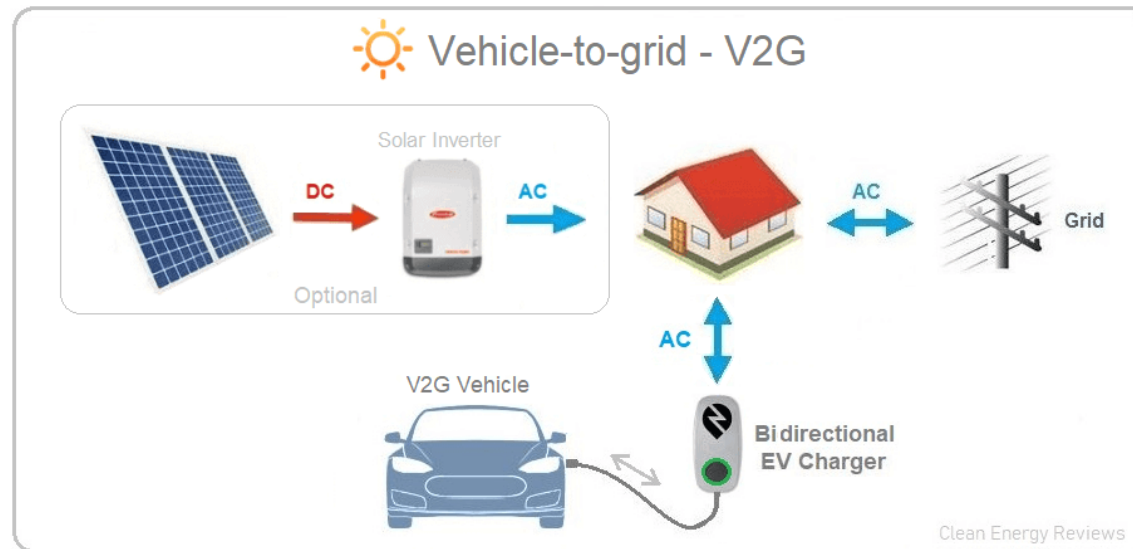
- MoP vide OM dated 28.03.2023 requested CEA to prepare guidelines on Reverse Charging of Grid from batteries of EV.
- Accordingly, a committee under the chairmanship of Member(GO&D), CEA was constituted vid letter dtd 11th April, 2023.
- This is the first meeting of the committee

Introduction

- The objective is to utilise the storage capacity of the EVs for the purpose of balancing requirement of the GRID as we are installing very large quantum of renewable energy sources in the GRID.
- By utilising this facility we can reduce the need of storage capacity in turn saving huge amount of money and which will help in achieving the goal carbon neutral economy by 2070.

Points to Discuss

- Bi-directional flow of electricity requirements
- Bidirectional charging challenges



Charger types

- **ChaDeMo (Japanese), CCS (EU and US), GB/T (Chinese) and Tesla (worldwide)**
- Of these, only the ChaDeMo protocol currently supports V2X.
- The CCS protocol is planned to support V2H from 2020 and V2G from 2025, with testing ongoing on a draft form of the protocol.

Challenges

- **Battery economics – can we go selective vehicle types viz. commercial ones, etc.**
- **Grid Security issues**
- **Customer willingness**