

Virtual Power Plant Market Trends in India 2020

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Abstracts

The Indian power sector has been undergoing transformation since the past few years, with growing contribution of renewable resources in the energy mix. The limited supply of fossil fuel has encouraged the penetration of distributed energy resources (DER) in the Indian power sector. Any energy resource which is connected to the grid at distribution level is known as DER. Grid integration of DERs has allowed the shift from centralized to decentralized systems. The development of this newly designed flexible energy network can be achieved using virtual power plants (VPP).

VPP allows numerous decentralized power plants to aggregate and operate as a single platform. It functions as a Cloud-based or SaaS-based platform which governs multiple decentralized power plants through various distribution routes and demand centers. Distributed plants can be remotely operated and controlled through VPP.

VPP ecosystem insights

The VPP ecosystem comprises technical virtual power plant (TVPP), commercial virtual power plant (CVPP), VPP aggregators, DERs, distribution companies, transmission companies and the electricity market. TVPP operates at distribution and transmission levels, whereas CVPP runs the DER units based on demand and generation potential. VPP aggregators facilitate the aggregation of DERs and communicate with TVPP and CVPP. DERs include controllable loads, electric vehicles (EV), solar PV units, natural gas turbines, small power plants, fuel cells, prosumers and energy storage.

The VPP platform consists of the solution developer, VPP platform operators and VPP users. The ecosystem consists of various energy assets such as solar plants, wind turbines, energy storage systems, EV charging stations, demand-response management centers and smart meters. Power utilities, renewable energy operators, demand response operators, energy retailers, VPP operators, and building managers

are the major stakeholders involved.

Market influencers:

Various functionalities of VPP like distributed asset monitoring, asset analytics, distributed asset control, renewable energy management, energy storage management, EV charging asset management, and demand response management are anticipated to influence the adoption of VPP in the Indian power sector.

Furthermore, favourable government policies and regulations are likely to play an important role in the adoption process. Vehicle electrification policy of the government, as part of Faster Adoption and Manufacturing of (Hybrid &) Electric Vehicles (FAME) and National Electric Mobility Mission Plan (NEMMP) 2020, will require the development of EV charging infrastructure. Implementation of VPP can help in effectively managing the charging stations spread across the country and control the load on each charging station. Furthermore, successful implementation of five-minute scheduling policy can be possible by using VPP.

However, the large scale implementation of VPP in India can be deterred by a number of challenging factors such as weak regulatory framework. Various utility companies are hesitant to join the VPP architecture owing to issues regarding grid safety, stability, operational efficiency, and pricing. Threat of cyberattacks significantly challenges the virtualization of power plants. Maintaining security and privacy of the enormous data generated from consumers and prosumers becomes a considerable challenge of the VPP market.

Companies covered

ABB Group

AutoGrid Systems, Inc.

cyberGRID GmbH & Co. KG

Enbala

GreenSync

MediIT Health Solutions India Pvt. Ltd

Next Kraftwerke GmbH

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