Workshop on Internet of Distributed Energy Architecture (IDEA) is organized by the Russian Infrastructural Center ENERGYNET at the 17th IEEE Conference on Industrial Informatics to address the related problems of transactive energy realization, plug & play power system design and constructing, decentralized primary power balance and frequency regulation and control, peer-to-peer markets realization.

Conventional centralized architecture of power grids and power industry in the whole has exhausted to a considerable degree its potential of effectiveness. In the context of challenges that emerge for power industry on a global scale, its outdated architecture can no longer be considered capable of addressing these challenges effectively.

The power grid based on new architecture will become:

1. Transactional: Economic interactions between users should be based on peer-to-peer transactions that allow implementation of wide range of services that provide users with customized values. Within this paradigm the users can play various roles.
2. Smart: Simplicity of integration (plug&play) of power equipment into the loops of automated control of various services.
3. Sustainable and flexible: physical connection of equipment units with the grid should be established in a convenient and user-friendly way using plug&play technologies to ensure static and dynamic stability of the system where large number of devices and equipment units influence each other. Users integrate into the system through specific interfaces and become participants of new services and business models.

The Internet of distributed energy represents a decentralized power grid where smart distributed control is performed through energy transactions among users of the system. The Internet of distributed energy represents a System of Systems which is composed of three integrated platforms:

1. Transactive Energy (TE): a system where smart contracts are composed, implemented and paid;
2. Internet of Things (IoT): a system of machine-to-machine interaction and exchange of control actions between power cells and power equipment;
3. Neural Grid (NG): a system that provides mode control, power balance maintenance, and ensures the static and dynamic stability of the power grid.
Main topics for the workshop will be:

- Internet of Energy Architecture (IDEA) and its components,
- Transactive energy and peer-to-peer markets for microgrids and distributed energy sources,
- Distributed ledger and fintech for "minutes ahead" and real time energy markets,
- Multi-agency platforms for "minutes ahead" and real time energy markets,
- IoT platforms for power systems, energy and power management and control,
- Virtual synchronous machines (VSM), "energy routers" and decentralized power flow and frequency regulation and control in remote microgrids.

The workshop is open to public (subject to registration).

Duration of the workshop is 3 hours.

To participate the workshop for presentation please contact the IC ENERGYNET official Igor Chausov igorchausov@gmail.com.