5G Initiative – "5G Roadmap" Working Group

Proposal for Contribution

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IEEE 5G

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Microgrid-based Power Infrastructure for Integrated Energy and Cellular Service Management

- **Topic Field**
  - Access infrastructure architecture.
- **Relation to SDOs and other**
  - Interfaces between microgrid/power infrastructure and 5G access infrastructure needs to be defined for dynamic exchange of status and configuration information.
- **Impact Horizon** (short, medium, long)
  - Short to medium.

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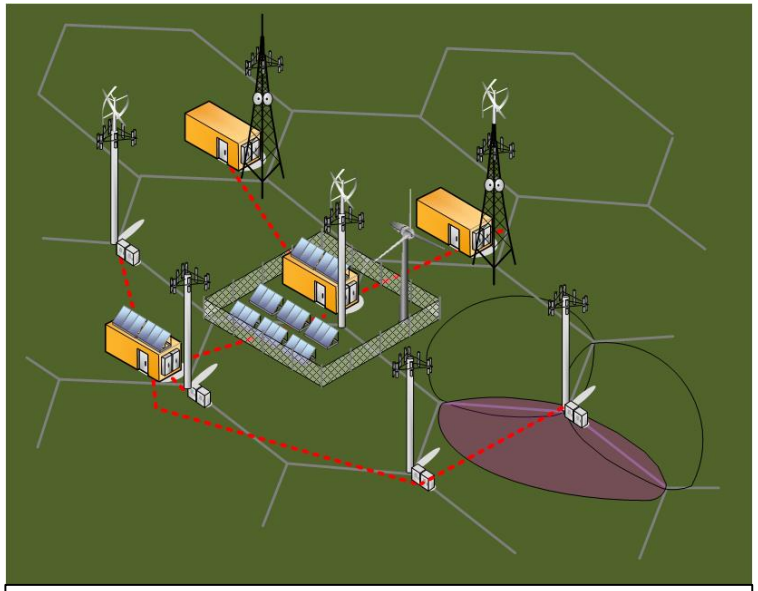

Sustinable Wireless Area (SWA): A microgrid to power a few cellular access sites.

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- **Contribution/Thought/Idea:**
  - **Cellular 5G access infrastructure becomes the electric load in a microgrid power system**:
    - Microgrid: A self-contained grid with loads, distributed power generation and system control located in the proximity of each other and which acts as a single controllable entity with respect to the grid.
  - Cellular 5G access infrastructure and electric power system become a **single controlled system**.
  - Cellular 5G access resources managed based on power system status.
  - **Delivered QoS/QoE can also be managed with little to no perceived impact for end users so as to consider status of power system (e.g. renewable energy availability).**
  - Cellular 5G access infrastructure fine-controlled to increase power savings (analog to Google's saving in data centers http://www.theverge.com/2016/7/21/12246258/google-deepmind-ai-data-center-cooling
  - **Increased power efficiency, increased used of renewable energy and increased system resiliency** to power outages and extreme events.