



Power and Connectivity

This Project Group Charter establishes the scope, intellectual property and copyright terms used to develop the materials identified in this Project Group. Only Participants that execute this Working Group Charter will be bound by its terms and be permitted to participate in this Project Group and shall be considered “Contributors” in the Project Group as defined in the **Telecom Infra Project IPR Policy document**.

TIP Board of Directors Approval Date: 2/21/2018

1. PROJECT GROUP NAME

Power and Connectivity

2. PURPOSE

1. To foster collaboration and standardization among organizations deploying connectivity and electricity infrastructure. The group will focus on ensuring that affordable and reliable energy is available for key connectivity use cases, with an initial focus on rural deployments. The group will also pursue opportunities for connectivity and electricity providers to co-deploy innovative technology and business models.

3. PROJECT GROUP SCOPE

The Power and Connectivity Project Group will foster collaboration among various members to seed projects/pilots in the following areas:

- i. **Information:** research on link between energy access & connectivity, cost analysis, effect of power cost/reliability on data usage
- ii. **Technology:** hardware and software development, open standards, APIs
- iii. **Finance:** business models / financial instruments that facilitate the deployment of power alongside connectivity infrastructure

Use cases the group will address:

Power for remote / rural network deployment, including:

- i. Powering rural access networks
- ii. Powering remote backhaul/lasthaul
- iii. Deploying edge networks and caches in off-grid and weak-grid environments

Members

Founding members include Telefonica, Airtel, Vodafone, Orange, MTN, Delta Electronics, Bel Power, Panasonic, Clear Blue Technologies, and Facebook

Business model Innovation in infrastructure deployment, including:

- i. Co-deploying internet and power infrastructure
- ii. Enabling charging infrastructure for consumer devices
- iii. Lowering power costs for macro towers
- iv. Deploying internet-connected electricity infrastructure (smart metering, smart grids, pay-as-you-go solar, etc.)

We will work to recruit and get active participation from companies in the following categories:

- i. Mobile network operators
- ii. Wireless ISPs and other rural connectivity providers (e.g., BRCK, Surf Everylayer, Coollink)
- iii. Power companies (e.g., Philips, Siemens)
- iv. Market information providers
- v. System integrators / tower operators
- vi. Handset manufacturers

4. PROJECT GROUP DELIVERABLES

The vision for the group is to build an active ecosystem of electricity and connectivity providers that will work together to deploy innovative infrastructure solutions. To accomplish this, we are targeting the following milestones:

At kickoff

- i. FB to contribute analysis showing causal relationship of FB metrics with energy access
- ii. Bloomberg New Energy Finance and FB to contribute white paper highlighting opportunities and challenges for power providers for connectivity, including current activities and investment
- iii. Share network operator power use cases and case studies to seed partnership discussions

June 2018 (London Tech Week)

- i. Telefonica and FB have independently developed power systems for access networks. Both will execute deployment plans with existing partners, and share outcomes with the group
- ii. Compile current electricity requirements, communications protocols, data formats, and other requirements from connectivity providers

- iii. Conduct discussions on shared requirements and potential for standardization
- iv. Kickoff new partnerships within the group to build and adapt HW+SW
- v. Put together sub-groups to explore innovative business models and financial instruments for co-deployment of electricity and connectivity infrastructure

October 2018 (TIP Summit)

- i. Publish first iteration of shared specifications /standards
- ii. Share results of field trials to drive iterations on HW+SW

February 2019 (MWC)

- i. Publish analysis of power and connectivity data to better understand energy's impact on network operator metrics such as costs, reliability, and ARPU.
- ii. Support at least two new entrants or existing companies to develop power HW or SW for connectivity, based on open standards
- iii. Pilot innovative business models and/or financial instruments within the subgroups

Ongoing

- i. Drive development, continuous refinement, and adoption of open specifications /standards
- ii. Continued tracking and sharing of power and connectivity data to better understand energy's impact on network operator metrics such as costs, reliability, and ARPU.
- iii. Continued development and pilots of innovative business models and/or financial instruments

5. PATENT LICENSING

The patent license for all Contributions, Draft Specifications and Final Specifications within this Project Group shall be:

[Check one box]

- RAND License Option**, as set forth in Section 5.2.1 of the Telecom Infra Project IPR Policy.
- Royalty-free License Option**, as set forth in Section 5.2.2 of the Telecom Infra Project IPR Policy.

6. FINAL DELIVERABLE COPYRIGHT LICENSING

Project Group agrees to grant the following copyright license for the Final Specification:

[Check one box]

x **Creative Commons Copyright Attribution 4**, Each Project Group Contributor agrees that its Contributions are subject to the Creative Commons Attribution 4.0 International license - <http://creativecommons.org/licenses/by/4.0/legalcode>.

□ **Full Release of Copyright into the public domain**, Each Project Group Contributor agrees to release its Contributions to the public domain and waive all copyrights associated with them.

7. INITIAL PROJECT CHAMPIONS

Facebook & Telefonica

8. CHAIR AND(OR) CO-CHAIR OF PROJECT GROUP

Co-Chair

Cesar Hernandez Perez, Telefonica

Co-Chair

Jamie Yang, Facebook

9. PARTICIPATION CRITERIA

- i. Network operators / WISPs / Tower operators will contribute use cases, cost breakdowns, and system requirements, while agreeing to discuss results from the TIP project group.
- ii. Power companies and other equipment providers need to actively participate in the development of technical and business model solutions.