



Upgrading Energy Regulations for Energy Regulatory Commission of the Philippines

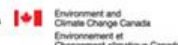
Focus Group Discussion Report



By



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Issue 2



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EXECUTIVE SUMMARY

The focus group discussion (FGD) is a new activity included in the project contract amendment issued last 23 February 2023. The main objective of this activity is to present and discuss with industry stakeholders Ricardo's proposed amendments in the regulatory documents.

3 Focus Group Discussions

The Energy Regulatory Commission (ERC) organised 3 FGDs on the proposed amendment to the Philippine Grid Code (PGC), the Philippine Distribution Code (PDC) and Philippine Small Grid Guidelines (PSGG) on 28 February 2023, 1 and 2 March 2023, respectively. Participants of these events are the following:

- FGD on PGC, a total of 49 stakeholders (39 males and 10 females) participated in this event representing 15 organisations (including the Consultant team).
- FGD on PDC, a total 44 stakeholders (33 males and 11 females) attended the event representing 12 organisations.
- FGD on PSGG, a total of 34 stakeholders (23 males and 11 females) joined the event representing 10 organisations.

Ricardo's proposed amendments to PGC, PDC and PSGG and the FGD presentation materials were circulated to the participants in advance. The matrices of the proposed changes are presented in Appendix 1a (PGC), Appendix 2a (PDC), and Appendix 3a (PSGG). The presentation materials are also given in Appendix 1b (PGC), Appendix 2b (PDC), and Appendix 3b (PSGG). The 3 regulatory documents (PGC, PDC and PSGG) are technical documents. Discussions during the FGDs covered a broad scope and mainly technical, and these are summarised in sections 1, 2 and 3 of this report.

ERC has given the industry stakeholders 2 weeks to review and submit their comments on the proposed amendments. These feedbacks will be forwarded to Ricardo to address and further improve the documents. The revised documents will then be processed according to ERC regulatory procedures in amending or issuing new regulations.

Debriefing Meeting

A debriefing meeting was organised on 3 March 2023 at ERC main office. The results of the discussions are the following:

- ADB Jacobs report on Ancillary Service (AS) Regulations. The Jacobs study proposed ancillary service categories that are aligned to the Australian rules but did not address some key issues such as the issue of rate of change of frequency and the resulting 'future' inertia requirements. ERC agreed that Ricardo will propose an inertia/fast frequency response in the grid code AS amendments for stakeholder review. The categorisation of the future ancillary services will be based on Ricardo's recommendations.
- Task 6 (Distribution Systems Loss Cap Analysis) and Task 7 (Strategic Review of ERC Regulations). ETP/UNOPS just recently approved the proposal to include 120+ electric cooperatives (ECs) in the system loss caps target analysis. Ricardo will work closely with ERC to obtain data necessary for EC analysis. The analysis for private distribution utilities (PDUs) is in progress and data validation for some PDUs will be coordinated with ERC. The strategic review is also in progress.
- Updated timeline. ERC and Ricardo discussed and finalised the timeline of each project tasks. The revised Gantt chart is shown in Section 5 of this report.

Updated Results-Based Monitoring Framework (RBMF)

As a result of the completion of the 3 FGDs, Ricardo updated the RBMF. This is shown in Appendix 4.

Feedback from ERC

Some of the comments from ERC during the FGDs particularly on the draft PSGG were not fully captured in the report. These comments are shown in Appendix 5. Ricardo will consider these comments and integrate its response in the drafting of the document.

1. PHILIPPINE GRID CODE (PGC)

The Focus Group Discussion (FGD) on the proposed amendments to the Philippine Grid Code (PGC) was organised on 28 February 2023 at the function room of the Linden Suites, Ortigas Centre, Pasig, Metro Manila, Philippines.

The session was opened by **Engr Legario Galang** of ERC and **Ms Fritzie Vergel** of ETP. A total of 49 stakeholders participated in the event which represented the following organisations:

- **Energy Regulatory Commission** (16 participants: 12 males and 4 females)
- **Energy Transition Partnership** (2 participants: females)
- **Department of Energy** (2 participants: males)
- **Philippine Electricity Market Corporation** (3 participants: males)
- **National Transmission Corporation** (3 participants: 2 males and 1 female)
- **Manila Electric Company** (3 participants: males)
- **Philippine Electric Plant Owners Association** (1 participant: male)
- **National Grid Corporation of the Philippines** (4 participants: 3 males and 1 female)
- **Philippine Independent Power Producers Association** (3 participants: males)
- **Independent Operator of the WESM** (2 participants: 1 male and 1 female)
- **National Power Corporation** (2 participants: males)
- **Davao Del Sur Electric Cooperative** (1 participant: male)
- **Quezon Electric Cooperative II** (1 participant: male)
- **Aboitiz Power** (1 participant: 1 female)
- **Ricardo Energy & Environment** (5 participants: 4 males and 1 female)



Figure 1. Participants of the Focus Group Discussion (FGD) on proposed amendment to the Philippine Grid Code: 28 February 2023

1.1 PRESENTATION

Dr Graeme Chown presented the proposed changes in the PGC which include the following (the slide presentation is given in **Appendix 1**):

- Alignment of the PGC to the Philippine Distribution Code, international practices, International Electrotechnical Commission (IEC) standards and Institute of Electrical and Electronics Engineers (IEEE) standards.
- Consideration to the USAID proposed changes to Philippine Grid Code and Philippine Distribution Code to ensure alignment to IEEE 2800-2022 and IEEE 1547-2018.

The proposed specific changes cover the following:

- energy storage including inverter-based energy storage system (IBESS) was added
- power quality and measurement
- protection arrangements
- reactive power range increased for large wind and PV technologies
- voltage control requirements
- fault ride through requirements
- frequency tolerance ranges
- conventional ESS connection requirements
- IBESS connection requirements

1.2 SUMMARY OF DISCUSSIONS

1.2.1 Compliance

- Since these are major amendments to the PGC and PDC, stakeholders requested to be given sufficient time to prepare their compliance plans - both in learning new standards and preparing for the capital and operational expenses to comply with new standards.
 - ERC will include this in the transitory provision and requested stakeholders to submit their proposed wordings for the revised code.
- Concerns were also raised related with derogation in the 2016 PGC. A number of generators failed to comply with the requirements, and compliance must be tested with a representative of NGCP present. Stakeholders expressed that the 60-day compliance time in 2016 PGC is not sufficient. Stakeholders also expressed that different Generator Unit Capability Tests (GUCT) should be conducted for new plants, plants under renewal and derated power plants. Legacy plants cannot comply with the test and must be exempted.
 - Ricardo agreed that separate testing should be conducted.
- Stakeholders requested to be given more time to comment on the proposed revisions using the comment matrix normally provided by ERC
 - ERC responded that the current focus group discussion is for Ricardo to gather inputs from stakeholders. Once the Consultants submit the recommendations, ERC will follow its standard procedures for public consultations.

1.2.2 Hydropower requirement

- A stakeholder operating a Mindanao hydropower plant commented on the performance for transmission system related to voltage duration. A table on typical duration for voltage magnitude should be provided. The IEC 61000 allows 10-minute duration, instead of a 1-minute duration, and this may be detrimental to the legacy plants.
 - Ricardo will review and confirm on the requirements.

1.2.3 Power Quality

- A stakeholder commented on the 1-minute and 10-minute differences in power quality disturbances. IEC standards defined short duration of less than 1 minute. Overloading of lines and capacitor switching may be considered cause for long term durations. The implication of this is to change the equipment rating.
 - Ricardo will check the IEC standard, but there is no intention to change the equipment rating.

- On PST 3.2.3.4, the allowable voltage under N-0 condition appears to have no limit for flicker severity.
 - Ricardo responded that for planning, the system should meet 0.9 flicker severity.

1.2.4 Use of standards

- A stakeholder asked why IEEE1547 standard was used for voltage control rather than the IEEE2800, since IEEE1547 is for distributed energy resources connected to the distribution system.
 - Ricardo replied that IEEE2800 refers to the distribution standard, so this also applies to transmission.

1.2.5 Definitions

- New terminologies are being introduced such as point of connection and delivery point while the current terminology is connection point.
 - Ricardo clarified that these all refers to connection point and will use the current terminology.
- There is also a provision of embedded generation to be 100 kW.

1.2.6 OATS rules

- Some of the provisions of the PGC are reflected in the OATS rules. With the amendment of the PGC, stakeholders asked whether they will be expecting amendment to the OATS rules.
 - ERC requested the stakeholder to specify provisions in the OATS rules that are inconsistent with the PGC amendments. It appears that at present they are all consistent.

1.2.7 Harmonics

- There appears to be a missing table in PST 3.2.4.
- There was a question whether there would be a provision for alert and emergency states in the PSGG, similar to the PGC.
 - Ricardo will check on the missing table and that the PSGG will have also provision for alert and emergency state.

1.2.8 Gas turbines

- For gas turbine technology, the output reduces with the drop in frequency but not in a linear manner. One stakeholder commented that gas turbines cannot satisfy the proportionate drop in the frequency decay and proposed to introduce an exception to the rule rather than derogation.
 - Ricardo mentioned that in the UK and other developed countries gas turbines can meet the requirement and that this section of the code is written by gas turbine manufacturers themselves. It is first time for Ricardo to hear this comment and will check and confirm.

1.2.9 Inverter compliance

- One stakeholder raised the question on whether grid forming inverters are required for new VRE plants.
 - Ricardo explained that normal inverters could also be used but needs to be supported by capacitor banks and/or stat coms.

1.2.10 Frequency response

- As more and more VRE power plants are connected to the grid, there is a need to review the code to ensure that it is responsive to frequency variations. The proposed change in PGC is based on the IEEE2800-2022. One stakeholder raised the question whether there is a new simulation analysis on frequency response across the national grid before adopting the IEEE standard.
 - ERC asked NGCP if there is a new study. NGCP explains that they are currently complying with the PIS as approved by ERC and are waiting for the results of the ancillary services study.
 - Ricardo explained that the proposed change is to make VRE response quicker. There is an ancillary service component of this project.

1.2.11 Grid management and distribution management committees

- One stakeholder queried on whether there is a plan to reconstitute the GMC and DMC
 - ERC responded that this is being considered.

1.2.12 Provisions for nuclear energy

- The Department of Energy is currently reviewing policies related to nuclear energy and queried whether there are provisions in the grid code for possible entry of nuclear power plants.
 - Ricardo responded that the possible addition to the grid code will be on the off-site supply for shutdown. Nuclear unit is normally treated as synchronous. The main issue would be on the unit size and available unit sizes are often determined by manufacturers. It takes at least 10 years for a 'new' nuclear unit to get a licence from the international nuclear authority to generate.

1.2.13 Large generator definition

- One stakeholder raised the question on the definition or size of a large generator.
 - Ricardo explained that the intention is to retain the existing 20, 10 and 5 MW classifications for the Luzon, Visayas and Mindanao grids. The usual unit size should not be bigger than 10% of the grid size.

1.2.14 Offshore wind and floating solar PV

- One stakeholder queried on whether the current amendments have provisions for offshore wind and floating solar PV projects.
 - Ricardo replied that there will be new requirements for offshore wind and floating solar PV and this will be included in the amendments.

1.2.15 Others

- Other points discussed include clarifications on the definitions and values in the amended documents.
 - Ricardo explained that for ESS charging capacity, BESS has a minimum charging level of 0% while pumped storage may have minimum at 70% and can vary up to 100%.

1.2.16 Additional comments

- There is a need to harmonize the proposed reserve categories for the ancillary services market, with the PGC.
- Primary frequency response should not be mandatory for those plants with no headroom.
- Consider fast frequency response and inertia in the amendments.

2. PHILIPPINE DISTRIBUTION CODE (PDC)

The Focus Group Discussion (FGD) on the proposed amendments to the Philippine Distribution Code (PDC) was organised on 1 March 2023 at the function room of the Linden Suites, Ortigas Centre, Pasig, Metro Manila, Philippines.

The session was opened by **Engr Ranillo Maatubang** of ERC and **Ms Fritzie Vergel** of ETP. A total of 44 stakeholders participated in the event which represented the following organisations:

- **Energy Regulatory Commission** (18 participants: 13 males and 5 females)
- **Energy Transition Partnership** (2 participants: females)
- **Department of Energy** (2 participants: males)
- **Philippine Electricity Market Corporation** (3 participants: 1 male and 2 females)
- **National Electrification Administration** (1 participant: male)
- **National Transmission Corporation** (2 participants: 1 male and 1 female)
- **Manila Electric Company** (3 participants: 3 males)
- **Philippine Rural Electric Cooperative Association Inc** (2 participants: males)
- **Philippine Electric Plant Owners Association** (2 participants: males)
- **National Grid Corporation of the Philippines** (3 participants: 2 males and 1 female)
- **Philippine Independent Power Producers Association** (1 participant: male)
- **Ricardo Energy & Environment** (5 participants: 4 males and 1 female)



Figure 2. Participants of the Focus Group Discussion (FGD) on proposed amendment to the Philippine Distribution Code: 1 March 2023

2.1 PROPOSED CHANGES TO THE PDC

Dr Graeme Chown presented the proposed changes in the PGC which include the following (the slide presentation is given in **Appendix 2**):

- Alignment of the PDC to international practices, International Electrotechnical Commission (IEC) standards and Institute of Electrical and Electronics Engineers (IEEE) standards.
- Consideration to the USAID proposed changes to Philippine Grid Code and Philippine Distribution Code to ensure alignment to IEEE 2800-2022 and IEEE 1547-2018.

The proposed specific changes cover the following:

- energy storage including inverter-based energy storage system (IBESS) was added
- power quality and measurement
- distribution technical, design, and operational criteria
- reactive power range increased for large wind and PV technologies
- voltage control requirements
- fault ride through requirements aligned to international practice
- frequency tolerance ranges aligned to international practice
- conventional ESS connection requirements
- IBESS connection requirements

2.2 SUMMARY OF DISCUSSIONS

2.2.1 Harmonisation

- There is a need to harmonize the proposed changes to the distribution code with the Distributed Energy Resources (DER) Rules released by the ERC recently. DER is not defined in the PDC.
- ESS that are indirectly connected to the grid – this needs to be changed to ESS connected to the distribution system (not distribution system utilities lines or industrial system facilities that are synchronized to the grid)
- The definition of ESS storage system company needs to be aligned with DER rules
- DER covers 100 kW - 1MW and hybrid and these need reference rules for connections. PDC should include rules for hybrid systems.
- Embedded generation does not include BESS in the PDC.
 - Ricardo will review and confirm.

2.2.2 Matrix format modifications

- A stakeholder commented on the need to modify the matrix of proposed changes to indicate new provisions and amended provisions.

2.2.3 Compliance to power quality

- Stakeholders should be given reasonable timeline to comply with amendments: 1) technical staff in charge of planning, operations require training on new standards; 2) a number of current meters are not compliant with the standards; 3) implications of new standard will require to spend new CAPEX and OPEX that were not included in the 5th regulatory period awaiting approval from the ERC.
- One utility has existing embedded generators, (coal, ROR hydropower plant and solar PV), and over time, they may be covered by the new amendments. The query is under what conditions will these embedded generators be covered by standards of the new PDC.
 - Ricardo clarified that new standards will be applied prospectively and to new plants. The EU codes have a concept of “major change” where you need to become compliant. This concept can be adopted to PDC (such as in the case of change of inverters, and upgrading to new plants, etc)

2.2.4 Classification of ESS

- ESS are being classified as hybrid and standalone. Hybrid could be classified as generator, but the standalone could be classified differently.
 - Ricardo explained that elsewhere, ESS is always treated as generator for licensing. But ESS can engage in energy storage, participate in the market as generator or a load depending on price, and participate as ancillary services provider.
 - Ricardo will review the classifications but at this stage ESS is being classified as generator.

2.2.5 ESS connection point

- DUs often require new technologies to comply with the standards at the connection point. The connection point for standalone VRE and standalone ESS are clear but it is not clear for a hybrid system.
 - Ricardo will review the connection requirements and address this concern.

2.2.6 Harmonics

- The proposed amendment related to harmonics was queried whether it is for individual equipment or whether the customer should be subjected to harmonic analysis at the point of common coupling or connection. The IEEE standard limits the harmonics contribution to the grid while the IEC standard limits the contribution of each individual equipment.
 - Ricardo explained that compliance to the standard must be demonstrated at the connection point whether it is a generator or a large industrial user.

2.2.7 DOE ESS Classification

- The draft DOE circular specifies 4 classifications of ESS. The current PDC classifies either a standalone or VRE. There is a need to add a separate section for hybrid systems.
 - Ricardo will consider the new classifications in order to be consistent.
 - ERC will provide the draft circular to Ricardo.

2.2.8 Reliability Indicators

- NEA is concerned about the power system protection which affects the reliability of a DU. A query on whether reliability/performance be included in the amendments.
 - ERC has taken a note on the comment and will review whether the reliability indices can be updated.

2.2.9 Power quality standards

- NGCP queried whether the IEC61000 will be adopted instead of other standards. It appears that NGCP is compliant with EN50160.
 - Ricardo explained that IEC61000 is adopted by most countries except the USA. IEC61000 is consistent or compatible with EN50160. If ERC suggests a different standard, Ricardo will consider it in the amendments.
 - ERC is interested to know whether moving to a new standard will entail change in power system and subsequently system costs.
- The associated costs for DUs in complying with the standards must also be considered by ERC.

2.2.10 Large generator definition

- There is a query on whether there should be one VRE generator size or different sizes.
 - Ricardo explained that it is better to have one value but advised to keep the existing recommended unit sizes. The USA allows different sizes while the EU treat below and above 10 MW. At single phase they switch from MW to amps. The trend is to have a single connection code.

2.2.11 Applicable tests for embedded generation facilities

- There is query on whether the applicable test for embedded generators depending on the size can be performed by the distribution utility or need to be witnessed by the system operator.
 - Ricardo explains that the generator performs all the tests while the system operator only witnesses it. Similar test requirements should be adopted but modified based on whether it is for new or existing generating facilities.

2.2.12 VRE/ESS categorisation

- A stakeholder proposed the following BESS categorisation
 - Small and micro – embedded RE and no export
 - 1 – 20 MW – embedded and with export
 - Ricardo expressed its understanding that capacities below 1 MW are not exporting. Ricardo will take this into consideration. Export limit will be applied due to potential overload in the LV network. Framework of categorising in terms of controls will be imposed. Using commercial rules to categorise needs to be thought about.

3. PHILIPPINE SMALL GRID GUIDELINES

The proposed amendment on the Small Grid Guidelines (PSGG) focus group discussion (FGD) was held last 2 March 2023 at the 4th Floor function room of the Linden Suites in Ortigas Centre, Pasig Metro Manila, Philippines.

The session was opened by **Engr Ranillo Maatubang** of ERC and **Ms Fritzie Vergel** of ETP. A total of 35 stakeholders participated in the event which represented the following organisations:

- **Energy Regulatory Commission** (15 participants: 10 males and 5 females)
- **Energy Transition Partnership** (2 participants: females)
- **Department of Energy** (2 participants: males)
- **National Electrification Administration** (1 participant: male)
- **National Transmission Corporation** (5 participants: 3 males and 2 females)
- **National Power Corporation** (2 participants: 1 male and 1 female)
- **Manila Electric Company** (3 participants: 2 males and 1 female)
- **First Catanduanes Electric Cooperative Incorporated** (1 participant: male)
- **KALTIMEX Rural Energy Corporation** (1 participant: male)
- **Ricardo Energy & Environment** (5 participants: 4 males and 1 female)



Figure 3. Participants of the Focus Group Discussion (FGD) on proposed amendment to the Philippine Small Grid Guidelines: 2 March 2023

3.1 PRESENTATION

Dr Graeme Chown presented the main changes in the PSGG which include the following (the slide presentation is given in **Appendix 3**):

- Alignment to the Philippine Distribution Code, international practices, International Electrotechnical Commission (IEC) standards and Institute of Electrical and Electronics Engineers (IEEE) standards.
- Consideration to the USAID proposed changes to Philippine Grid Code and Philippine Distribution Code to ensure alignment to IEEE 2800-2022 and IEEE 1547-2018.

The specific proposed changes cover the following:

- energy storage including inverter-based energy storage system (IBESS) was added

- power plant classification and reclassification
- removal of generator connection conditions – refer to PDC
- power quality and measurement
- small grid planning studies
- variable renewable energy and operating reserve forecast
- generating unit and generating plant data
- generating unit capability test requirements
- scheduling and dispatch requirements

3.2 SUMMARY OF DISCUSSIONS

3.2.1 Capability test

- One of the licensing requirements for small grids for generators is to carry out a generating capability test (GUCT). This test is not clearly defined, and the query is on whether this could be clearly defined in the PSGG in terms of Pmin, Pmax, ramp rate etc.
- ERC plans to include some of the components of the law on microgrid service providers (MGSP) to PSGG. MSGP categorises 5 connection points and categories 1-4 have definitions for GUCTs. The GUCT for Category 5 however is not provided. The query is whether these could be included in the PSGG.
 - Ricardo explained that some of the tests are applicable for VRE but this needs to be further discussed since the current tests in the guideline are applicable for conventional plants only.

3.2.2 Distributed Energy Resources

- The ERC Resolution 11 series of 2022 defines a business model for DER which is the same as self-generation. There are however field cases that DER owners sell the electricity to others. ERC recommended this to be included in the PSGG.
 - Ricardo will review and study requirements and provide recommendations.
- The classification of generating plants in the PSGG is similar to PDC. The definition of micro-generating plant is however in conflict with MSGP. Also, MSGP does not provide capacity range for microgenerators.
 - Ricardo expressed that most of the test requirements are mainly for conventional generating plant and not for VRE. Further discussion will be needed whether this will be integrated in the PSGG.
 - ERC has ongoing discussions on minimum technical services and performance standards for microgrids under the new law and is looking at IEC standards. This will be discussed internally within ERC.

3.2.3 PSGG scope

- It appears that the categories for embedded generation under PDC is to be adopted for PSGG. The query is on whether the scope of PSGG is being expanded.
 - Ricardo explained that it would be a one connection code whether it is transmission or distribution since the requirements are generally the same. The difference will be on the size and impact hence the definition of generator sizes in the PDC is retained. This will ensure compliance when they will be interconnected in the future. Ricardo is not inclined to define this by the voltage level.
- A follow up is on why it is defined a guideline and not rules or codes.
 - Ricardo explained that guidelines are not mandatory, but the reliability and technical standards should be similar or equivalent to power quality requirements for large grid so that when they will be connected in the future, generators will be automatically in compliance.

3.2.4 Standalone PSGG document

- The PSGG requirements are for off-grid systems for 9 kV transmission only. Some of the generator data were deleted and a stakeholder proposed to retain it since there are generators connected to the 69 kV transmission in off-grid areas in which the distribution system is connected at 13.2 kV level.
 - Ricardo explained that it is possible to provide the same requirements in the PSGG but there will be some document management problem in the future. If PGC is to be updated, the PSGG needs to be updated as well. The PSGG should be a standalone document that does not need to be affected by changes in the PGC and PDC.

3.2.5 Operating reserve

- The role of VRE in off-grid areas is important. Existing conventional generation are mainly from diesel power plants (other than Masbate with small coal-fired power plant. With RES variability the query is on Ricardo's experience related to the operating reserve requirement.
 - Ricardo mentioned one of its studies in the Pacific Islands. For PV serving the peak demand, the reserve requirement should be around 80%.
 - This depends on the time of day the VRE is serving. The break-even point for PV is about 5 times the peak demand. If there is enough storage capacity, the use of diesel-based generation is mainly based on weather variability. Economic consideration is very important.

3.2.6 System operator

- The recent DOE circular stipulates that while the grid owner is the NPC, the system operation function have been transferred to TRANSCO (for more than 1 generator). The query is on the responsibility for demand-supply forecasting.
 - Ricardo explains that the current assumption in the PSGG amendment is that the grid owner is the same as the system operator. The responsibility for forecasting falls on the entity doing the scheduling and dispatch.
- TRANSCO confirms the recent changes, and that TRANSCO established a technical working group to review the systems operation. PSGG must be aligned with this new directive.
- DOE further clarified that in areas that there is only 1 distribution utility and 1 generator, the distribution utility will be retained as the system operator.

3.2.7 ESS classifications

- DOE expressed that the ESS categorisation in PSGG must be aligned with the 4 categories proposed by DOE in the new DOE circular.

3.2.8 Contractual implications

- A representative from a utility in Catanduanes queried on the implications of its current power supply agreement (PSA) and the IPPs through the competitive selection process (CSP) when their system will be interconnected with the national grid.
 - ERC responded that this might entail amendments in contract which requires ERC approval.

3.2.9 Summary of Codes

- The PSGG can be developed into a standalone code for small grids. This will become independent from PGC and PDC.
- The PSSG only applies to transmission connected generators and the PDC will apply to embedded generation in the small grid.
- The rules for micro grids will be separate from the PSGG as a microgrid code under the microgrid law. The microgrid code mandates minimum and performance standards. For the time being, those standards from PGC and PDC can be used.

3.2.10 EV charging stations

- ERC is concerned about the standard parameters for EV and suggested that rules for EV charging stations be included in the draft PDC amendments (or in the Annex).
 - Ricardo explained that there is a big concern with respect to EV charging. The 80-kWh car battery fast chargers will exceed maximum limits on single phase, slow charges are set to 7 kW/h and from distribution utility perspective, it is problematic when all chargers will pull the maximum charge simultaneously. The UK has limits for entire charging station and each station must manage based on these limits. Further discussions will be needed concerning EV charging stations.

3.2.11 Connection points

- A stakeholder suggested to consider adding definitions for connection asset, connection facility and ownership at connection point.
- A stakeholder queried on whether there should be guidelines for teeing into the existing transmission system. (Teeing in means no isolation breakers).
 - ERC explained that this is allowed for 69 kV network. But for small grids, this is already a backbone and reliability issues may arise if the connection be made in span of the line.
 - Ricardo explained that a study should be made on the impact and what the connection requirements/protection system be required. This should be treated on case-to-case basis.

3.2.12 Final PSGG document

- ERC expressed that the PSGG should be aligned with the latest DOE policy, and these should be reflected in the current amendments. ERC on the other hand also expressed that the PSGG be developed as standalone code for small off grid areas.

4. DEBRIEFING MEETING

The debriefing meeting was held on 3 March 2023 at ERC Office. The meeting was participated by ERC, ETP and Ricardo teams.

- ERC
 - Rhanny Maatubang
 - Nestor Padilla
 - James Melvin Mea
- ETP
 - Fritzie Vergel
- Ricardo
 - Graeme Chown
 - Romeo Pacudan
 - Jessie Todoc
 - Silver Navarro
 - Caryl Lopez

4.1 SUMMARY OF DISCUSSIONS

4.1.1 ADB Jacobs Study Results

- Dr Chown noted that the current Jacobs Study proposed ancillary service categories that are aligned to the Australian rules. The study included the increase in non-synchronously connected generation but didn't address the issue of rate of change of frequency and the resulting 'future' inertia requirements (or sub second fast frequency response).
- Ricardo has already provided comments on the AS categories and suggested that rate of change of frequency should be a concern, specifically for small networks with significant inverter-based generation.
- ERC agreed that Ricardo should propose an inertia / fast frequency response in the grid code AS amendments for stakeholder review. The categorisation of future AS should be performed independent of the Jacobs Study and based on Ricardo's experience.
- Ricardo was requested to review the latest PEMC application with the rules for the price determination with the co-optimisation of energy and reserves.

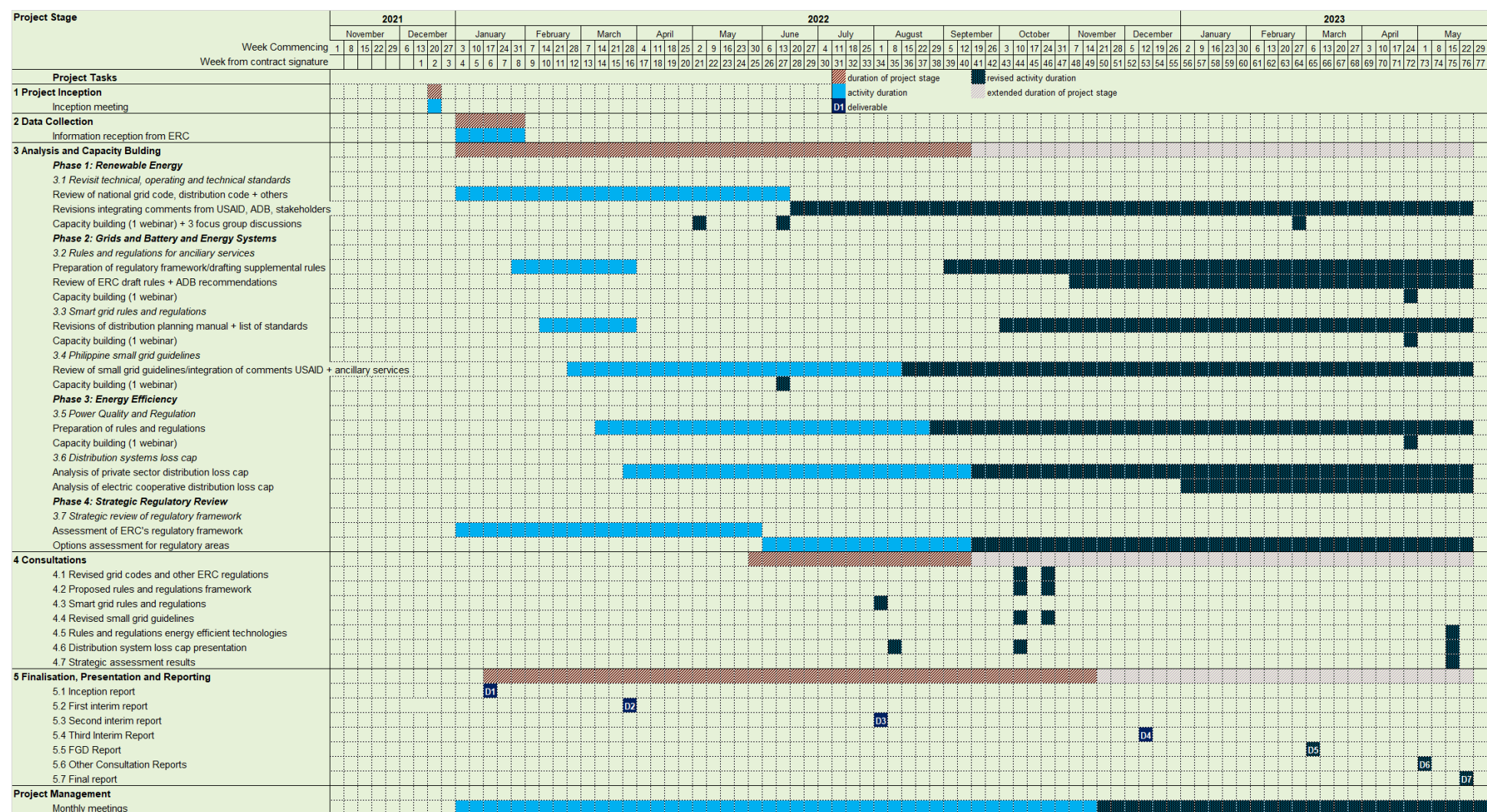
4.1.2 Tasks 6 (distribution system loss cap analysis) and 7 (strategic review of ERC regulation)

- Ricardo updated the status of tasks 6 and 7. ETP just recently approved the proposal to include 120+ ECs in the system loss caps target analysis. Ricardo will work closely with James Melvin Mea to obtain data necessary for EC analysis. The analysis for private distribution utilities is in progress and data validation for some PDUs will be coordinated with ERC. The strategic review is also in progress.
- ERC and Ricardo agreed to finalise these tasks by end of May 2023.

4.1.3 Revised timeline

- ERC and Ricardo updated the timeline for specific tasks. The revised Gantt chart is shown in Section 5 of this report.

5. UPDATED TIMELINE



APPENDICES

Appendix 1 PGC FGD Materials

See attached PDF files

1a. Matrix of proposed changes to Philippine Grid Code

1b. Presentation materials

Appendix 2 PDC FGD Materials

See attached PDF files

2a. Matrix of proposed changes to Philippine Distribution Code

2b. Presentation materials

Appendix 3 PSGG FGD Materials

See attached PDF files

3a. Matrix of proposed changes to Philippine Small Grid Guidelines

3b. Presentation materials

Appendix 4 Updated RBMF

See attached RBMF

Appendix 5 ERC Feedback on FGD Report

There were comments from ERC during the FGD that were not fully captured in the report. Most of these comments are related to the PSGG. As mentioned in the Executive Summary, these comments will be addressed while preparing the draft PGC, PDC and PSGG reports. These are the following:

- 1) Can we include the definition of GUCT (Pmax, Pmin, and ramp rates) and be considered as part of the test under the connection requirements.
- 2) MGSP definition inclusion.
- 3) For MGSP test, who shall witness the conduct of the test?
- 4) Is there a need to issue and Approval to Connect or any equivalent docs to MGSP?
- 5) Can we recognize the entry of Distributed Energy Resources (DER) as power ERC Resolution 11, Series of 2022. This is a new business model that is similar with self-generation facility, but the owner of the establishment and the operator of the generation facility is different.
- 6) There's a conflict in the proposal to classify generating plants similar with PDC. For example, the classification of micro generating plan that recognized only certain capacities, this is in-conflict with the generating plant classification as stated in the micro grid service provider act.
- 7) Does the category classification in the existing Appendix A of the PSGG remain the same?
- 8) Based on the existing PSGG, for categories 1 to 4, the generator before it operates, shall secure a Connection Agreement/ Approval to Connect with the Grid Owner/ Operator. However, for Category 5, this is not applicable, since for this Category there is only one entity that handles the generation and distribution side. Further, what technical document can we require in lieu of CATC/CA for Category 5?
- 9) Can excerpts of IEEE standards and other international standards cited in the codes be provide to ERC



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