



## ARMENIA RENEWABLE RESOURCES AND ENERGY EFFICIENCY FUND

### PROMOTION OF RENEWABLE ENERGIES - PHASE IV / V / VI (GAF - RE)

TASK` TECHNICAL REQUIREMENTS AND RECOMMENDATIONS FOR THE IMPLEMENTATION OF GROUND-MOUNTED AND ROOFTOP PV SYSTEMS FOR OWN CONSUMPTION OVER 150 KW UP TO 500 KW

19.01.2024

## CHECKLIST OF REQUESTED DOCUMENTS

1. Land coordinates;
2. Land privatization certificate for ground-based projects or rental agreement with permission to install the project of the land-owner / permission for rooftop installation;
3. Energy yield forecast / PVsyst or equivalent commercial simulation software\*;
4. Monthly load profile of own consumption based on existing data on demand (e.g., electricity bills) and / or plausible assumptions for new buildings / enterprises;
5. Project description of the layout, civil structures, electrical and mechanical equipment;
6. Justification of structural design for foundations / rooftop installation and respective module mounting structures for the wind and snow resistance in the corresponding area/roof;
7. Electrical single line diagram for DC single line, protections, switches, circuit breakers, cable specifications;
8. Technical specifications for PV modules (including PV module certificates).

## CHECKLIST OF REQUESTED DOCUMENTS

9. Technical specifications for Inverters (including Inverter certificates);
10. PV DC cable certificates;
11. Official document from the distribution network operator or authority granting the connection to the network;
12. Cost Estimation;
13. Implementation Schedule;
14. Photos concerning the site and other structures;
15. O&M concept/budget;
16. Information on-site security (fence, security cameras, etc.);
17. Information on Operation monitoring scheme;
18. License (PSRC);
19. Conclusion on the technical condition and durability of the roof.



# **EVALUATION OF GROUND-MOUNTED PV SYSTEMS**



# FOUNDATIONS AND STRUCTURES



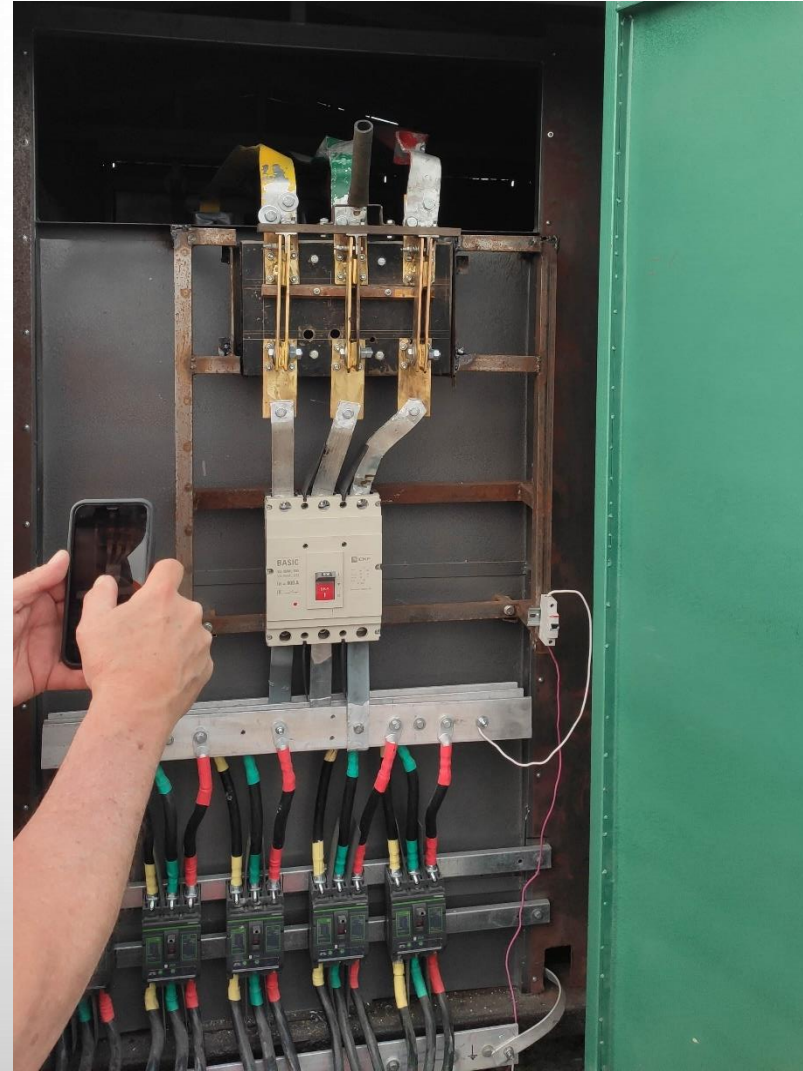


# WIRING, GROUNDING AND MODULES





## SUBSTATIONS, AC DISTRIBUTION BOXES



The transformer is old, there is an oil leak from the cooling system. Life busbars are not sufficiently shielded.



# EVALUATION OF ROOFTOP PV SYSTEMS



# PV MOUNTING STRUCTURES



# PV MODULES AND INVERTERS





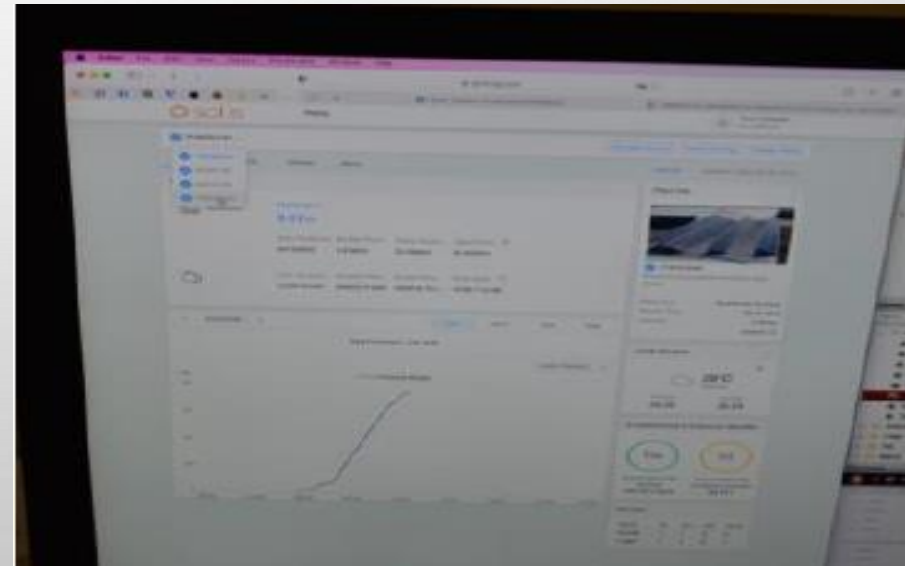
## AC/DC BOXES



## SECURITY



## I&C, MONITORING





The background features a light gray gradient with several realistic water droplets of various sizes scattered in the corners. A faint, circular, concentric pattern is visible in the upper center of the page.

# DEFICIENCIES

## INCORRECT MOUNTING STRUCTURE



## SHADING OF PV MODULES



## NO EXPLOSION-PROOF INVERTER INSTALLATION





## INCORRECT AC/DC BOXES





## EXPOSED CABLING



## NO EXPLOSION-PROOF PV MODULE INSTALLATION





# HAZARDS

