

Resettlement Due Diligence Report

May 2020

Cambodia: Grid Reinforcement Project

Subprojects

- i) New 6.52 km 230 kV transmission line from existing GS5 to proposed Sen Sok substation (TPP1)
- ii) New 2.44 km 115 kV transmission line from proposed 230/115 kV Sen Sok to proposed 230/115kV Russei Keo substations (TPP2)
- iii) New 4.4 km 115 kV transmission line from proposed Boeung Tompon substation to new Olympic substation (TPP3)
- iv) New 230/115/22 kV Sen Sok substation (SPP2)
- v) New 115/22 kV Royal University of Phnom Penh substation (SPP3)
- vi) New 115/22 kV Boeung Tompon substation (SPP4)
- vii) New 115/22 kV Russei Keo substation (SPP5)

CURRENCY EQUIVALENTS

(as of 13 May 2020)

Currency unit	–	Riel (KR)
KR1.00	=	\$0.00024
\$1.00	=	KR4,111

ABBREVIATIONS

ADB	–	Asian Development Bank
BESS	–	battery energy storage system
DDR	–	due diligence report
EDC	–	Electricité du Cambodge
EPC	–	engineering, procurement and construction
GIS	–	geographic information system
GS6	–	Grid Substation 6
ha	–	hectare
HV	–	high voltage
JICA	–	Japan International Cooperation Agency
kV	–	kilovolt
kVA	–	kilovolt-ampere
LARF	–	land acquisition and resettlement framework
LARP	–	land acquisition and resettlement plan
LV	–	low voltage
MV	–	medium voltage
MVA	–	mega-volt-ampere
MW	–	megawatt
PIC	–	project implementation consultant
PVC	–	polyvinyl chloride
ROW	–	right-of-way
SCADA	–	supervisory control and data acquisition
SPS	–	Safeguard Policy Statement
UGC	–	underground cable

NOTE

In this report, "\$" refers to United States dollars.

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A. Project Background

1. Cambodia underwent significant development in recent years reaching lower middle-income status in 2015. The country continues to demonstrate strong economic growth, mainly driven by urban based industries such as garment exports, tourism, and more recently construction and real estate. Per capita gross national income grew on average 7.3% per annum from \$950 in 2013 to \$1,230 in 2018.¹
2. Cambodia's population is about 15.3 million and continues to annually increase by 1.3%.² The country is at an early stage of urbanization with 23% of people living in cities. At an average annual urbanization growth rate of 3.3%, it is expected that 28% of the population will live in urban areas by 2030 and 40% by 2050.³ The bulk of urbanization is taking place in Phnom Penh which serves as a regional economic center, strategically located along the Greater Mekong Subregion Southern Economic Development Corridor and regional industrial developments.⁴
3. Phnom Penh, the capital, where presently 2 million people live, and government, business and industry are concentrated, currently accounts for 57% of electricity consumed. About 23% of total electricity consumption is used in the other urban areas including Preah Sihanouk, Siem Reap, Kampong Cham, Takeo, and Battambang. Households and businesses face frequent unpredictable power shortages and voltage fluctuations. It severely constraints quality of life and undermines the country's effort to diversify into a manufacturing destination.
4. The Government aspires to attain middle-income status by 2030. In its Socio-Economic Policy Agenda, 2018–2023, the government recognizes the importance of developing the energy sector to increase competitiveness, ensure sustained economic growth and thereby continue to reduce poverty. Constructing transmission lines and substations to enhance adequate and reliable supply of power is one of the key energy policy objectives of the government and the Electricité du Cambodge (EDC). Cambodia's electricity consumption grew to 9,307 gigawatt-hours in 2018 and is forecast to rise to 28,542 gigawatt-hours by 2025, a greater than threefold increase relative to consumption in 2018. To meet growing demand for electricity with environmentally and socially sustainable supply, it is planned to increase solar power generation capacity from 10 megawatt (MW) to 415 MW and to develop 80 MW of generation capacity from wind by 2022.
5. The Asian Development Bank (ADB) is working with Cambodia's national electric utility, EDC, to develop a Grid Development Project. The Grid Reinforcement Project (the project) will support EDC, the state-owned power utility, in improving transmission network capacity and stability. The project will (i) expand and reinforce the electricity transmission infrastructure by constructing 115 kilovolt (kV) and 230 kV transmission lines and associated substations in Phnom Penh, Kampong Chhnang, Kampong Cham, and Takeo provinces; and (ii) introduce the first utility-scale battery energy storage system to enhance power reliability and grid stability accompanied by an increase in electricity generated from renewable energy sources. Project implementation consultants (PIC) will complement existing staff of EDC, thus ensuring a high degree of implementation efficiency of components financed under the project.

¹ ADB. 2015. *Basic Statistics 2015*. Manila; and ADB. 2019. *Basic Statistics 2019*. Manila.

² Royal Government of Cambodia. 2019. *General Population Census of the Kingdom of Cambodia*. Phnom Penh.

³ World Bank Data. <https://data.worldbank.org/indicator/SP.URB.GROW>. Accessed 12 July 2019.

⁴ Baker, Judy L.; Kikutake, Natsuko; Lin, Sarah Xinyuan; Johnson, Erik Caldwell; Yin, Soriya; Ou, Narya. 2017. *Urban development in Phnom Penh* (English). Washington, D.C.: World Bank Group.

6. The project is aligned with the following impact: adequate and reliable power supply from environmentally sustainable energy sources ensured. The project will have the following outcome: transmission network capacity and stability improved. The project will finance the following outputs:

- (i) **Output 1: 115 kilovolt and 230 kilovolt grid infrastructure expanded and reinforced.** The proposed project will support the expansion of 115 kV and 230 kV overhead and underground transmission lines and associated substations in Phnom Penh, Kampong Chhnang, and Kampong Cham provinces. It will add 13 circuit-kilometer (cct-km) of 230 kV transmission lines, 36.7 cct-km of 115 kV transmission lines, 1,475 megavolt-ampere to 230 kV/ 115 kV/ 22 kV substation transformer capacity and 350 megavolt-ampere to 115 kV/ 22 kV substation transformer capacity.

Table 1. 115 kilovolt and 230 kilovolt Grid Infrastructure Expanded and Reinforced

N°	Subproject Name	Subproject Scope
Transmission Lines and Substations in Phnom Penh		
TPP1	New 6.52 km 230 kV transmission line from existing GS5 to proposed Sen Sok substation	230 kV double circuit line; ~ 5 km overhead on monopoles and 1.5 km underground cable
TPP2	New 2.44 km 115 kV transmission line from proposed Sen Sok to proposed Russei Keo substations	115 kV double circuit line; ~ 1.5 km overhead on monopoles and 1.0 km underground cable
TPP3	New 4.4 km 115 kV transmission line from proposed Boeung Tompon substation to new Olympic substation	115 kV double circuit line; ~ 2.4 km overhead on monopoles and 2.0 km underground cable; plus 0.8 km underground cable for SPP3 connection
SPP1	New 230/115 kV Dangkor substation	2x240 MVA 230/115 kV transformers; outdoor switchyard; 2 x 230 kV circuits; 4 x 115 kV circuits
SPP2	New 230/115/22 kV Sen Sok substation	1x360 MVA 230/115 kV transformer; 1x75 MVA 115/22 kV transformer; GIS indoor switchgear; 2 x 230 kV circuits; 2 x 115 kV circuits
SPP3	New 115/22 kV RUPP substation	1x75 MVA 115/22 kV transformers; GIS indoor switchgear; 4 x 115 kV circuits
SPP4	New 115/22 kV Boeung Tompon substation	1x75 MVA 115/22 kV transformer; GIS indoor switchgear; 6 x 115 kV circuits
SPP5	New 115/22 kV Russei Keo substation	1x75 MVA 115/22 kV transformer; GIS indoor switchgear; 4 x 115 kV circuits
Transmission Lines and Substations in Kampong Chhang (KCN), Kampong Cham (KPC) and Takeo (TKO) provinces		
TKCN1	New 11.1 km 115 kV transmission line from proposed Samiki Meanchey to proposed Kampong Tralach substations	115 kV double circuit line; overhead on steel towers
SKCN1	New 230/115/22 kV Samiki Meanchey substation	1x160 MVA 230/115/22 kV transformer; outdoor switchyard; 4 x 230 kV circuits; 2 x 115 kV circuits
SKCN2	New 115/22 kV Kampong Tralach substation	1x50 MVA 115/22 kV transformer; outdoor switchyard; 2 x 115 kV circuits

N°	Subproject Name	Subproject Scope
SKPC1	New 230/22 kV Thnal Keng substation	1x75 MVA 230/22 kV transformer; outdoor switchyard; 4 x 230 kV circuits; 2 x 115 kV circuits
SKPC2	New 230/22 kV Skun substation	1x75 MVA 230/22 kV transformer; outdoor switchyard; 4 x 230 kV circuits
STKO1	New 230/115/22 kV Samroang Yoang substation	1x240 MVA 230/115/22 kV transformer; outdoor switchyard; 4 x 230 kV circuits; 2 x 115 kV circuits

- (ii) **Output 2: First utility-scale energy storage system provided.** The project will support EDC in installing the first utility-scale battery energy storage system (BESS) in Cambodia. The BESS will be capable of storing 15 to 18 megawatt-hour of power.⁵ This is a desirable size to support the applications of (a) smoothing output at 80% from a 60MW solar park,⁶ (b) providing at least 0.5 hour of curtailment reserve to address daily power shortcuts, (c) providing primary frequency control, (d) deferring upgrades in transformer capacity at GS6 substation, and (e) shifting lower cost electricity supply to high cost peak demand to achieve savings. Such stacking of multiple services is a standard feature of BESS installations and the project will enable EDC to test the requirements for and benefits of BESS in providing the combined set of services as a precursor to scaling-up its use in future. Validation tests will be conducted to understand the effectiveness of the storage system at stabilizing the grid. It will help building capacity for deploying and operating energy storage technology thus, creating the foundation for EDC to scale-up energy storage as part of power system development in the near future. The BESS will be constructed at the site of the national solar park substation which is financed by ADB, and for which the land has been acquired by EDC through negotiated land acquisition in accordance with respective requirements of ADB SPS 2009 and an independent external party was engaged to document negotiation and settlement processes.⁷

7. The project will support EDC in implementing the project components with a focus on procurement and contract management, construction supervision, testing and commissioning, implementation, updating and monitoring of social and environmental safeguards, implementation of gender and social equality dimensions, project performance monitoring and evaluation. The PIC will complement existing staff of EDC, thus ensuring a high degree of project implementation efficiency.

8. Land acquisition will be required for Output 1, where land is needed for development of transmission lines and substations. Except for the new 11.1 km 115 kV transmission line from proposed Samiki Meanchey substation to proposed Kampong Tralach substation (TKCN1), EDC intends to acquire the land required for the (i) New 230/115/22 kV Dangkor substation (SPP1), (ii) New 230/115/22 kV Samiki Meanchey substation (SKCN1), (iii) New 115/22 kV Kampong Tralach

⁵ The BESS will be financed with a \$6.7 million grant. Based on cost estimates using 2018 prices, a BESS size of 15MW/15MWh can be installed. Considering, however, that prices for BESS continue to decrease, the BESS was designed for an optimal size of 18MW/18MWh.

⁶ ADB. 2019. *Report and Recommendations of the President to the Board of Directors: Proposed Loan and Administration of Loan, Grant, and Technical Assistance Grant to the Kingdom of Cambodia for the National Solar Park Project*. Manila.

⁷ Based on the agreement between ADB and EDC the DDRs are prepared and submitted to ADB for its due diligence and records.

substation (SKCN2), (iv) New 230/22 kV Thnal Keng substation (SKPC1), (v) New 230/22 kV Skun substation (SKPC2), and (vi) New 230/115/22 kV Samroang Yoang substation (STKO1) through negotiated settlement based on meaningful consultation with affected persons. According to ADB 2009 Safeguard Policy Statement (SPS) (para. 25 Safeguard Requirements 2), SR2 does not apply to negotiated settlements, unless expropriation would result upon the failure of negotiations. For this purpose, a land acquisition and resettlement framework (LARF) has been prepared in case of failed negotiated settlement resulting in expropriation. In addition, a land acquisition and resettlement plan (LARP) is prepared for the subproject outlined under Output 1 where land acquisition is necessary for the transmission line (TKC1).

9. The remaining subprojects, including (i) New 6.52 km 230 kV transmission line from existing GS5 to proposed Sen Sok substation (TPP1), (ii) New 2.44 km 115 kV transmission line from proposed Sen Sok to proposed Russei Keo substations (TPP2), (iii) New 4.4 km 115 kV transmission line from proposed Boeung Tompon substation to new Olympic substation (TPP3), (iv) New 230/115/22 kV Sen Sok substation (SPP2), (v) New 115/22 kV Royal University of Phnom Penh (RUPP) substation (SPP3), (vi) New 115/22 kV Boeung Tompon (SPP4) substation, and (vii) New 115/22 kV Russei Keo (SPP5) substation are proposed to be developed on public land, thus causing no land acquisition impacts on any household or individual (**Table 2**). The screening and scoping activities of these subprojects did not find any encroachment and squatters use of public land. The proposed public land proposed to be used is free of encumbrances. Therefore, preparation of a LARP is not necessary. The consultation results with the local authorities and communities also confirmed that there is no household to be affected by land acquisition for the subproject development.

Table 2. List of Proposed Subproject Develop on the Public Land

N°	Subproject Name	Subproject Scope
Transmission Lines and Substations in Phnom Penh		
TPP1	New 6.52 km 230 kV transmission line from existing GS5 to proposed Sen Sok substation	230 kV double circuit line; ~5 km overhead on monopoles and 1.5 km underground cable
TPP2	New 2.44 km 115 kV transmission line from proposed Sen Sok to proposed Russei Keo substations	115 kV double circuit line; ~1.5 km overhead on monopoles and 1.0 km underground cable
TPP3	New 4.4 km 115 kV transmission line from proposed Boeung Tompon substation to new Olympic substation	115 kV double circuit line; ~2.4 km overhead on monopoles and 2.0 km underground cable; Olympic SS now under construction with JICA funding
SPP2	New 230/115/22 kV Sen Sok substation	1x360 MVA 230/115 kV transformer; 1x75 MVA 115/22 kV transformer; GIS indoor switchgear; 2 x 230 kV circuits; 2 x 115 kV circuits
SPP3	New 115/22 kV RUPP substation	2x75 MVA 115/22 kV transformers; GIS indoor switchgear; 4 x 115 kV circuits
SPP4	New 115/22 kV Boeung Tompon substation	1x75 MVA 115/22 kV transformer; GIS indoor switchgear; 6 x 115 kV circuits
SPP5	New 115/22 kV Russei Keo substation	1x75 MVA 115/22 kV transformer; GIS indoor switchgear; 4 x 115 kV circuits

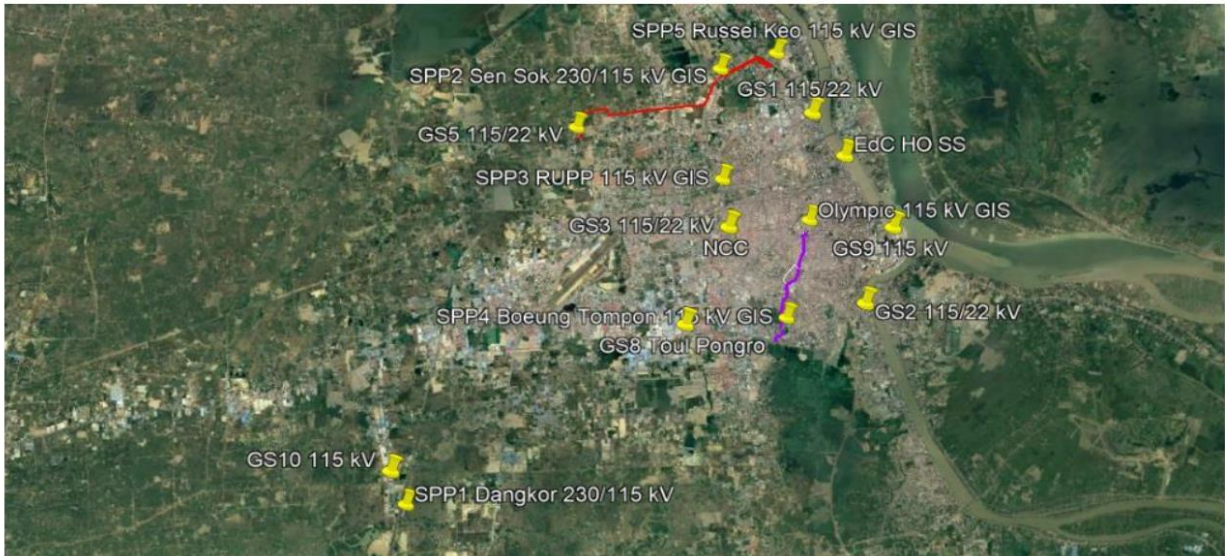


Figure 1. Transmission Lines and Substations in Phnom Penh

B. Rationale for Due Diligence

10. A full feasibility study has been prepared for the Grid Reinforcement Project. Since preparation and submission of adequate social safeguards documents is a condition for ADB's approval of subproject loan, each component/subproject has been carefully reviewed in terms of its involuntary resettlement and indigenous peoples impacts. In accordance with the ADB's 2009 SPS, and the Bank's OM Section F1/OP (October 2013) field validation and due diligence has confirmed that the above subprojects have no land acquisition and hence does not trigger the involuntary resettlement safeguard, and Indigenous People safeguards. However, in order to ensure that the project impacts are well managed, this Due Diligence Report (DDR) is prepared to serve as a social safeguard document of the above-listed subprojects.

11. In addition, the following projects, namely (i) 230 kV GS5 substation, (ii) 115 kV Olympic substation, and (iii) the underground cable from NCC to Toul Kork and Beung Kok, are considered associated facilities of TPP1, TTP3, and SPP3, respectively. As per ADB 2009 SPS and 2012 A Planning and Implementation Good Practice Sourcebook (para. 21), for a project that is not funded by ADB and may cause involuntary resettlement but is critical to the design or implementation of the ADB project, ADB will carry out due diligence on involuntary resettlement that results from such projects by obtaining information on how the adverse impacts will be identified and addressed.⁸ Therefore, due diligence has been conducted to ensure that the land acquisition activities of these projects are in compliance with the SPS 2009 requirements and Cambodian land laws and regulations. The due diligence review of these projects is discussed in Section G below.

C. Description of the Subprojects Proposed on Public Land

1. New 6.52 km 230 kV Transmission Line from existing GS5 to proposed Sen Sok substation (TPP1)

⁸ Involuntary Resettlement Safeguards A Planning and Implementation Good Practice Sourcebook – Draft Working Document. 2012. ADB <https://www.adb.org/sites/default/files/institutional-document/32827/files/ir-good-practices-sourcebook-draft.pdf>

12. **Location.** New 6.52 km 230/115 kV transmission line from existing GS5 to proposed 230/115 kV Sen Sok substation will be built in the Sen Sok khan in the North of Phnom Penh city. This area is new urban development.

13. **Objective.** The objective of the subproject is to provide high voltage (HV) power to the new Sen Sok and Russei Keo substations in order to meet growing demand in the area.

14. **Scope of work.** The scope of the subproject includes construction of new 6.52 km double-circuit 230 kV transmission line (~52 km overhead on steel monopoles and 1.5 km underground cable) between existing GS5 230/115 kV substation and proposed Sen Sok 230/115 kV substation (Subproject SPP2). This line will also facilitate the onward 115 kV supply to the TPP2 subproject to supply the proposed Russei Keo substation (subproject SPP5). In order to connect the TPP1 line, the scope of work for subproject SPP2 will include and equip (i) the two 230 kV line bays at Sen Sok substation, and (ii) two new 230 kV line bays at GS5 substation. Alternatively, EDC should consider equipping the two 230 kV line bays at GS5 as part of the GS5 contract.

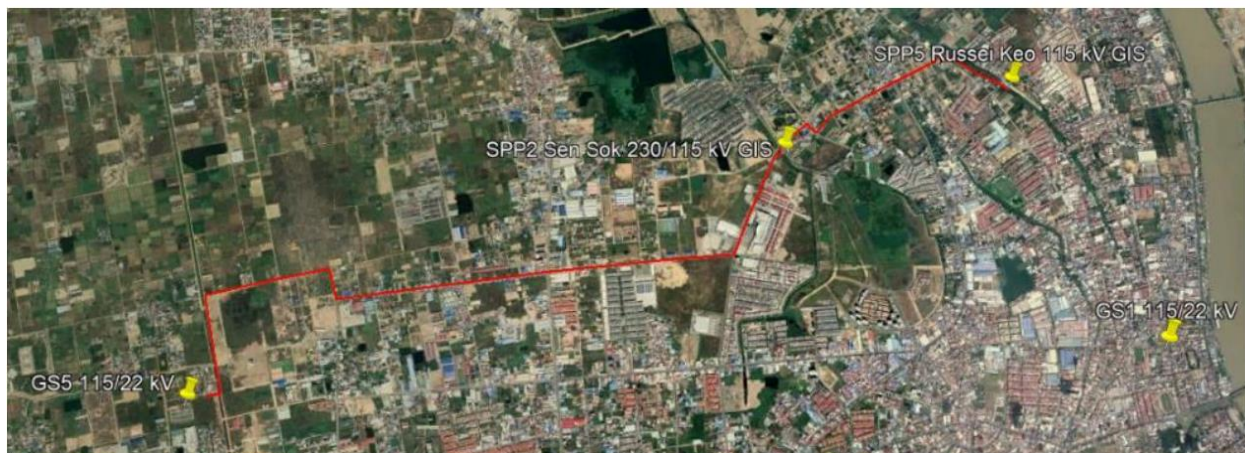


Figure 2. Proposed TPP1 230 kV and TPP2 115 kV Transmission Line Route

15. **Description.** The proposed 230 kV transmission line follows the road alignment and is all on public land without need for land acquisition. The line route is shown in Figure 2. The TPP1 double circuit 230 kV transmission line connecting between the 230 kV busbars at GS5 substation and Sen Sok substations. The overhead line design provides for Bittern4 ACSR 645 mm² twin conductors per phase, with a nominal rated capacity of 115 mega volt-ampere (MVA) per circuit, plus one top mounted ground wire (OPGW cable 50 mm² plus 48 optic fibers) for lightning shielding, protection and communications. Towers will be 30 m steel monopole with in-situ cast reinforced concrete foundations. Insulators will be polymer post type installed directly on the poles without crossarms, in order to minimize the width of the right-of-way. Average spans will be 250 m, with section poles located on large angles.

16. The underground cable design provides for six single-core 1,200 mm² 230 kV aluminum XLPE insulated cables, plus a separate 48 core fiber optic cable, to be installed underground in seven sets of 100mm Φ polyvinyl chloride (PVC) pipes. Jointing pits will be installed at approximately 300 to 500 m intervals, depending on the maximum available lengths of cable. It is estimated that implementation of this engineering, procurement and construction (EPC) subproject, excluding detailed design, will take approximately 36 months from start of construction.

2. New 2.44 km 115 kV transmission line from proposed 230/115 kV Sen Sok to proposed 230/115 kV Russei Keo substations (TPP2)

17. **Location.** New 2.44 km 115 kV transmission line from proposed 230/115 kV Sen Sok to proposed 230/115kV Russei Keo substations (TPP2) will be built in the Khan Sen Sok and Khan Russel Keo in the North of Phnom Penh city.

18. **Objective.** The objective of the subproject is to provide HV power to the new Russei Keo substation in order to meet growing demand in the area.

19. **Scope of work.** The scope of the subproject includes construction of new 2.44 km double-circuit 115 kV transmission line (~1.55 km overhead on monopoles and 1.0 km underground cable) between proposed Sen Sok substation (Subproject SPP2) and proposed Russei Keo substation (Subproject SPP5).

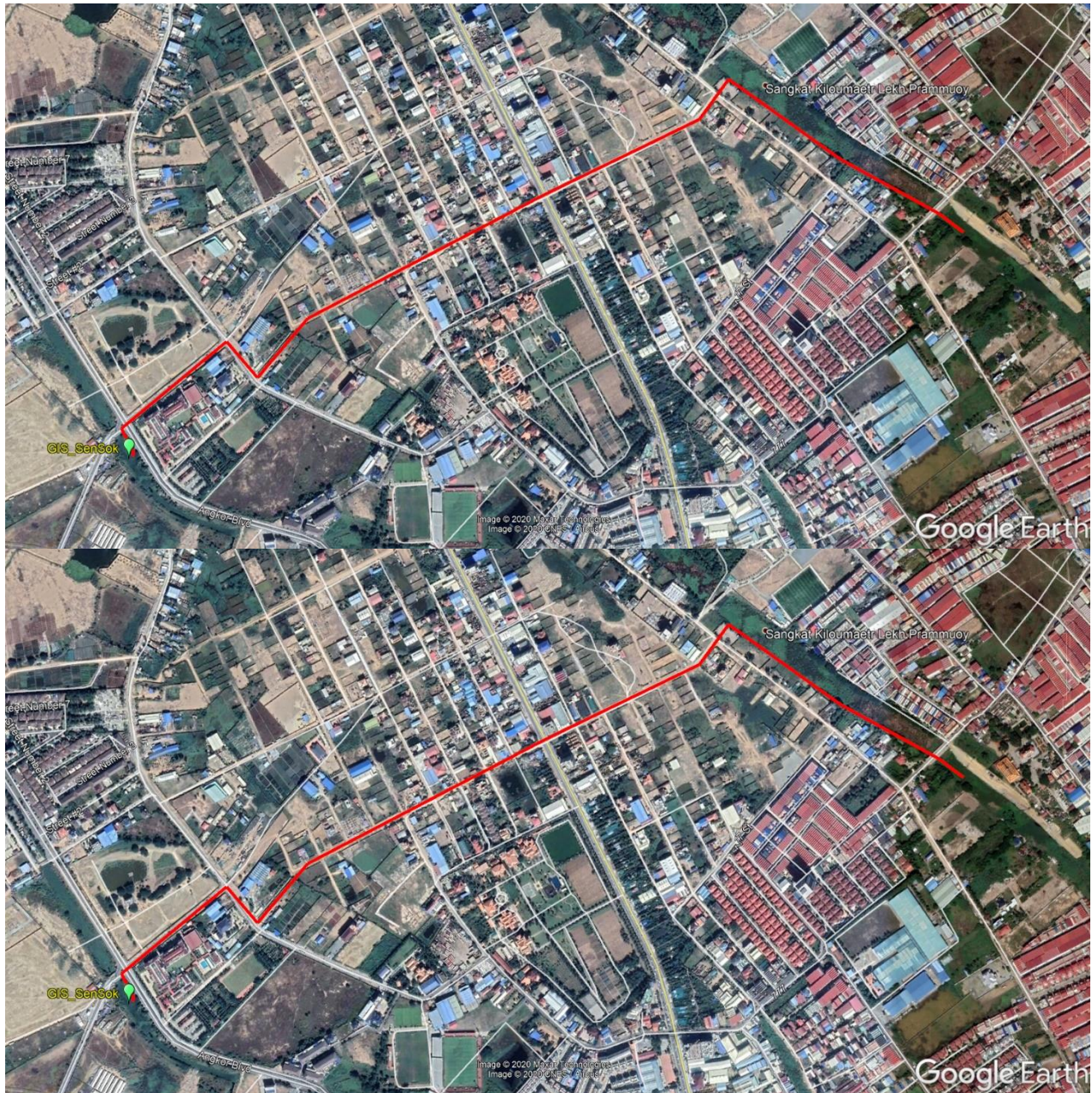


Figure 3. TPP2 TL Alignment

20. **Description.** The proposed transmission line follows the road alignment and is all on public land without need for land acquisition. The line route is shown in Figure 3. The TPP2 double circuit 115 kV transmission line connecting between the 115 kV busbars at Sen Sok and Russei Keo substations. The scope of work for subprojects SPP2 and SPP5 will both include and equip two sets of 115 kV geographic information system (GIS) line bays to connect this TPP2 line. The overhead line design provides for Bittern ACSR 645 mm² conductor per phase, with a nominal rated capacity of 30 MVA per circuit, plus one top mounted ground wire (OPGW cable 50 mm² plus 48 optic fibers) for lightning shielding, protection and communications.

21. Towers will be 30 m steel monopole with in-situ cast reinforced concrete foundations. Insulators will be polymer post type installed directly on the poles without crossarms, in order to

minimize the width of the right-of-way. Average spans will be 250 m, with section poles located on large angles.

22. The underground cable design provides for two three-core 800 mm² 115 kV aluminum XLPE insulated cables, plus a separate 48 core fiber optic cable, to be installed underground in three sets of 100mm Φ PVC pipes. Jointing pits will be installed at approximately 300m to 500m intervals, depending on the maximum available lengths of cable. It is estimated that implementation of this EPC subproject, excluding detailed design, will take approximately 36 months from start of construction.

3. New 4.4 km 115 kV transmission line from proposed Boeung Tompon substation to new Olympic substation (TPP3)

23. New 4.4 km 115 kV transmission line from proposed 230/115 kV Boeung Tompon to proposed 115kV Olympic substations will be built in the Khan Mean Chhey and Khan Chamka Monin the South of Phnom Penh city.

24. **Objective.** The objective of the subproject is to provide HV power to the new Boeung Tompon substation in order to meet growing demand in the area and to provide a link between the existing 115 kV lines south of Boeung Tompon substation (which connect to GS4 and GS2) and the Olympic 115 kV GIS substation.

25. **Scope of work.** The scope of the subproject includes construction of (i) new 4.4 km double-circuit 115 kV transmission line (~2.4 km overhead on monopoles and 2.0 km underground cable); between proposed Boeung Tompon 230/115 kV substation (subproject SPP4) and Olympic 115 kV substation; and (ii) new 0.5 km four-circuit 115 kV overhead transmission line between Boeung Tompon 230/115 kV substation and the existing double circuit 115 kV overhead line in Tomnop Thmey (371 Street).

26. This subproject also includes 0.8 km (four-circuit x 0.2 km) 115 kV cables to connect from new RUPP 115 kV GIS substation (subproject SPP3) to the existing double circuit 115 kV cables in Street N° 598.



Figure 4. TPP3 TL Alignment



Figure 5. Existing 115 kV Double Circuit Line in 371 Street

27. **Description.** As shown in Figure 4, the proposed transmission line follows a route beside a canal in the southern section and the road alignment in the northern half and is all on public land.

28. The Olympic 230/115 kV substation is adjacent to the stadium and is now under construction under a Japan International Cooperation Agency (JICA)-funded project. The proposed SPP4 Boeung Tompon substation is located next to a rubbish site. The TPP3 double circuit 115 kV transmission line connecting between the 115 kV busbars at Olympic and SPP4 Boeung Tompon substations. At SPP4, four 115 kV circuits will interconnect to the existing double circuit 115 kV overhead line in Tomnop Thmey (371 Street). Currently, one circuit of this line interconnects GS8 and GS2 115 kV substations; the other circuit interconnects GS3 and GS9 115 kV substations. In the new arrangement, two circuits from SPP4 will connect to GS2, one circuit to GS3 and one to GS8.

29. Provision will need to be made in the Olympic 115 kV JICA substation to include and equip two GIS line bays for the TPP3 line. The scope of work for subproject SPP4 will include and equip the six 115 kV line bays to connect the TPP3 line. The overhead line design provides for Bittern ACSR 645 mm² single conductor per phase, with a nominal rated capacity of 28 MVA per circuit, plus one top mounted ground wire (OPGW cable 50 mm² plus 48 optic fibers) for lightning shielding, protection and communications.

30. Towers will be 30 m steel monopole with in-situ cast reinforced concrete foundations. Insulators will be polymer post type installed directly on the poles without crossarms, in order to minimize the width of the right-of-way. Average spans will be 250m, with section poles located on large angles.

31. The underground cable design provides for two three-core 800 mm² 115 kV aluminum XLPE insulated cables, plus a separate 48 core fiber optic cable, to be installed underground in three sets of 100mm Φ PVC pipes. Jointing pits will be installed at approximately 300 to 500 m intervals, depending on the maximum available lengths of cable. It is estimated that implementation of this EPC subproject, excluding detailed design, will take approximately 36 months from start of construction.

4. New 230/115/22 kV Sen Sok Substation (SPP2)

32. **Location.** The substation will be located in the khan Sen Sok in the North of Phnom Penh City. The proposed land for substation is government land. The geographical boundary of the substation is as follows:

- i) bordered to the North by canal;
- ii) bordered to the South by AEON2 Mall;
- iii) bordered to the West by street number 1003; and
- iv) bordered to the East by Australia International School of Phnom Penh.

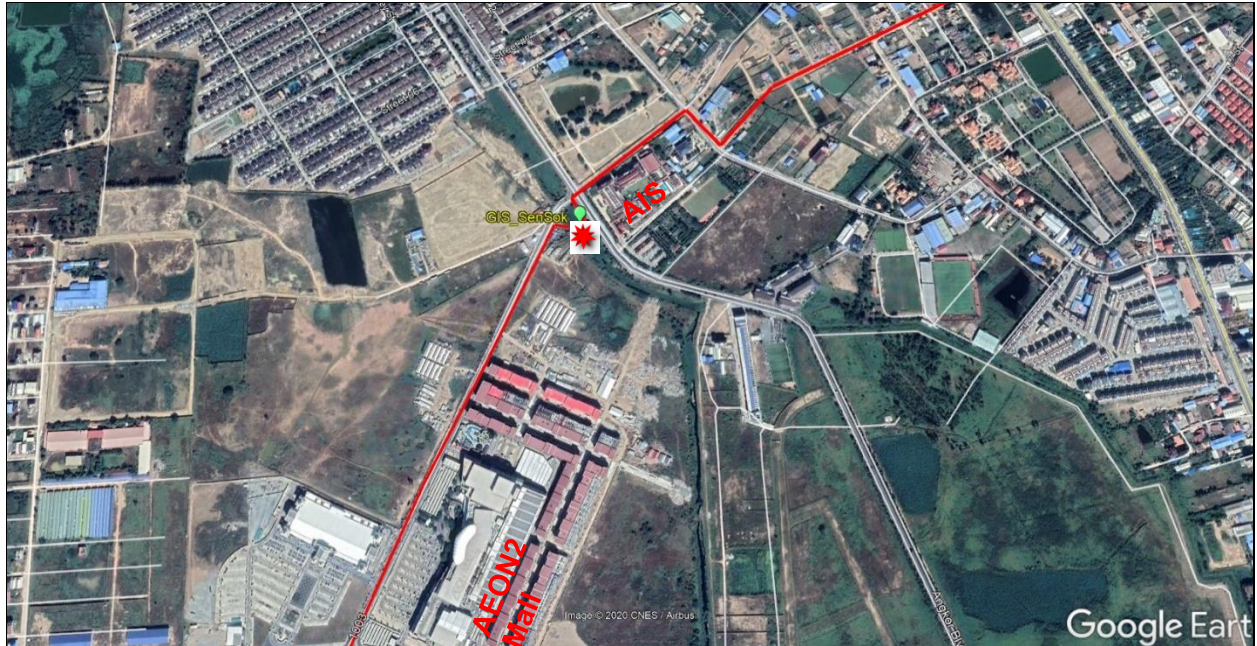


Figure 6. Sen Sok SS Location



Figure 7. Proposed Sen Sok 115 kV Site

33. **Objective.** The objectives of the subproject are to (i) provide a reliable power supply to the north Phnom Penh area, (ii) reduce load on existing nearby GS1 and GS5 grid substations, and (iii) improve the reliability and safe operation of the medium voltage (MV)/ low voltage (LV) system and reduce losses.

34. **Scope of work.** The scope of the subproject includes installation of a new greenfield 115/35/22 kV GIS Sen Sok substation, with provision to connect (i) subproject TPP1 incoming double circuit 230 kV lines, and (ii) subproject TPP2 outgoing double circuit 115 kV lines to proposed SPP5 Russei Keo substation. The scope includes (i) one 360 MVA 230/115 kV

transformer, (ii) one 75 MVA 115/22 kV transformer, and (iii) 22 kV indoor panel to supply the adjacent 22 kV distribution network.

35. **Description.** The location of SPP2 substation is shown in Figures 6 and 7. The proposed substation location is beside a canal on public land in urban northern Phnom Penh. Because of limited land availability, this will be an indoor GIS design, covering a 30m x 60m area. The exact location and use of the site are pending confirmation by EDC.

36. The substation design provides for a capacity of 360 MVA at 230/115 kV and 75 MVA at 115/22 kV. The 230kV indoor GIS switchgear design is double busbar, with four bays (two outgoing line switches, one transformer switch, one bus interconnector bay). The 115kV indoor GIS switchgear design is also double busbar, with four bays (two outgoing line switches, one transformer switch, one bus interconnector bay). The 22kV indoor switchboard is single busbar, with initially twelve panels (one transformer incomer, 8-line feeders, 1 VT, MV capacitor bank and 1 auxiliary MV/LV 100 kilo-volt-ampere [kVA] station transformer). The design provides for supervisory control and data acquisition (SCADA) system and connection to EDC's National Control Centre. It is estimated that implementation of this EPC subproject, excluding detailed design, will take approximately 36 months from start of construction.

5. New 115/22 kV Royal University of Phnom Penh Substation (SPP3)

37. **Location.** The substation will be located in the Sen Sok khan in the North of Phnom Penh city. The land proposed for the substation belongs to the government and is vacant land. The geographical boundary of the substation is as follows:

- i) bordered to the North by Taloak Bek;
- ii) bordered to the South by railway;
- iii) bordered to the West by Tralok Bek canal; and
- iv) bordered to the East by RUPP.



Figure 8. Royal University of Phnom Penh SS Location

38. **Objective.** The objectives of the subproject are to (i) ensure the power supply for Phnom Penh, (ii) reduce load on existing GS3 and GS5 115 kV substations, and (iii) improve the reliability and safe operation of the MV/LV system and reduce losses.

39. **Scope of work.** The scope of the subproject includes installation of new greenfield 1x75 MVA 115/22 kV RUPP (Royal University of Phnom Penh) GIS substation.

40. **Description.** As shown in Figure 8, the proposed substation location is on public land western Phnom Penh, adjacent to the railway line. Because of limited land availability, this will be an indoor GIS design, covering a 20m x 40m area (0.8 Ha). The exact location and use of the site are pending confirmation by EDC.

41. RUPP will connect at 115 kV between NCC and GS1 (via BBK) substations. It will require four 115 kV cables to connect to the existing 115 kV cables in Street N° 598 about 200 m away. This will be included in subproject TPP3. The 115/22 kV substation design provides for an initial capacity of 75 MVA, with provision for a future second 75 MVA transformer. The 115kV indoor GIS switchgear design is double busbar, with six bays (four outgoing line switches, two transformer switches (includes provision for second transformer), one bus interconnector bay). The 22kV indoor switchboard is single busbar, with initially twelve panels (one transformer incomer, 8-line feeders, 1 VT, MV capacitor bank and 1 auxiliary MV/LV 100 kVA station transformer). The design provides for SCADA system and connection to EDC's National Control Centre. It is estimated that implementation of this EPC subproject, excluding detailed design, will take approximately 36 months from start of construction.



Figure 9. Proposed SPP3 Royal University of Phnom Penh 115 kV Substation Site

6. New 115/22 kV Boeung Tompon Substation (SPP4)

42. **Location.** The substation will be located in the Khan Mean Chhey in the South of Phnom Penh City. The SS will be built on the government land area where garbage landfill is located. The geographical boundary of the substation is as follows:

- i) bordered to the North by Sangkat Boeung Tompun;
- ii) bordered to the South by Tnaot Chrum Ti Bey, Street 371;

- iii) bordered to the West by Boung Tompun canal; and
- iv) bordered to the East by garbage site.



Figure 10. Boeung Tompon SS Location

43. **Objective.** The objectives of the subproject are to (i) ensure the power supply for south Phnom Penh, (ii) reduce load on existing GS2 and GS8 (via KEC) 115 kV substations, and (iii) improve the reliability and safe operation of the MV/LV system and reduce losses.

44. **Scope of work.** The scope of the subproject includes installation of new greenfield 1x75 MVA 115/22 kV Boeung Tompon GIS substation.

45. **Description.** The proposed substation location is on public land (refer Figure 10), currently used as a rubbish tip, in south of Phnom Penh city. Because of limited land availability, this will be an indoor GIS design, covering a 20m x 40m area (0.8 ha). The exact location and use of the site by EDC are subject to finalizing ownership with the Phnom Penh City Hall.

46. Boeung Tompon will interface at 115 kV to subproject TPP3 between the Olympic substation currently under construction and the existing double circuit 115 kV overhead line in Tomnop Thmey (371 Street). The 115/22 kV substation design provides for an initial capacity of 75 MVA, with provision for a future second 75 MVA transformer. The 115kV indoor GIS switchgear design is double busbar, with nine bays (six outgoing line switches, two transformer switches (includes provision for second transformer), one bus interconnector bay). The 22kV indoor switchboard is single busbar, with initially twelve panels (one transformer incomer, 8-line feeders, 1 VT, MV capacitor bank and 1 auxiliary MV/LV 100 kVA station transformer). The design provides for SCADA system and connection to EDC's National Control Centre. It is estimated that implementation of this EPC subproject, excluding detailed design, will take approximately 36 months from start of construction.



Figure 11. Proposed Boeung Tompon 115 kV Site

7. New 115/22 kV Russei Keo Substation (SPP5)

47. **Location.** The substation will be located in located in the Sangkat Russey Keo, Khan Russei Keo in the Northeast of Phnom Penh City. The SS will be built on the government land area close to the bridge street 200R. The geographical boundary of the substation is as follows:

- i) bordered to the North by Sangkat Kilomaetr Lekh Prammuoy and bridge, street 200R;
- ii) bordered to the South by Russey Keo River;
- iii) bordered to the West by Russey Keo River; and
- iv) bordered to the East by Toul Os Lok pagoda.



Figure 12. Russei Keo SS location

48. **Objective.** The objectives of the subproject are to (i) ensure the power supply for north Phnom Penh, (ii) reduce load on existing GS1 115 kV substation, and (iii) improve the reliability and safe operation of the MV/LV system and reduce losses.

49. **Scope of work.** The scope of this optional subproject includes installation of new greenfield 1x75 MVA 115/22 kV Russei Keo GIS substation.

50. **Description.** The location of SPP5 substation is shown in Figure 12. The proposed substation location is beside a canal on public land in urban northern Phnom Penh. Because of limited land availability, this will be an indoor GIS design, covering a 20m x 40m area (0.8 Ha). The exact location and use of the site are pending confirmation by EDC.

51. Russei Keo substation will connect at 115 kV to Sen Sok 115 kV substation and provide for future two 115 kV circuits to GS1 substation. The 115/22 kV substation design provides for an initial capacity of 75 MVA, with provision for a future second 75 MVA transformer. The 115kV indoor GIS switchgear design is double busbar, with six bays (four outgoing line switches, two transformer switches (includes provision for second transformer), one bus interconnector bay). The 22kV indoor switchboard is single busbar, with initially twelve panels (one transformer incomer, 8-line feeders, 1 VT, MV capacitor bank and 1 auxiliary MV/LV 100 kVA station transformer). The design provides for SCADA system and connection to EDC's National Control Centre. It is estimated that implementation of this EPC subproject, excluding detailed design, will take approximately 36 months from start of construction.



Figure 13. Proposed SPP5 Russei Keo 115 kV Substation Site

D. Methodology of Resettlement Due Diligence

52. The following methods were utilized for the purpose of this DDR, including:

- i) desk study method: the consultant reviewed feasibility study report for subproject features and scale;
- ii) field trips were conducted to observe and assess the subproject impacts; and
- iii) public consultation with the stakeholders.

E. Screening and Assessment of Impacts of the Subprojects

1. Type of civil works envisaged under the project

53. **For the overhead line part**, most of the tower footings are to be placed on government land avoiding private land and the area proposed for substations are public land. For the cable stringing, access roads will be taken use of the existing roads.

54. Standard area of land to be acquired permanently for the foundation of each monopole: $6.4\text{m} \times 6.4\text{m} = 40.96$ square meter (sqm) and construction area for the foundation of each monopole to be temporarily acquired inclusive of the area that will be acquired permanently: $8\text{m} \times 8\text{m} = 64$ sqm. For the purpose of the assessment, $6.4\text{m} \times 6.4\text{m}$ (40.96sqm) has been considered for permanent acquisition and additional of 28 sqm each for temporary acquisition for construction area (**Figure 14**).



Figure 14. Typical Dimension of Monopole Foundation

55. The statutory right-of-way for the transmission line is 15m. The design of the line took into consideration both the vertical and horizontal clearance measures which means, the line does

not have adverse impacts on structures or buildings within the stipulated vertical and horizontal clearance area. However, in order to minimize impacts under the right-of-way (ROW), it is suggested that wiring arrangements on one side of the tower should be considered when undertaking a detailed design for the subproject.

56. The clearance between each conductor of overhead high-voltage lines and other facilities shall be not less than 3.5m for the 115 kV TL and 4.2m for the 230 kV TL. For the clearance to trees, the safety distance shall be not less than 2.5m for the 115 kV TL and 3.2m for the 230 kV TL, according to Cambodian Electric Power Technical Standards by Ministry of Industry, Mines and Energy (**Figure 15**).

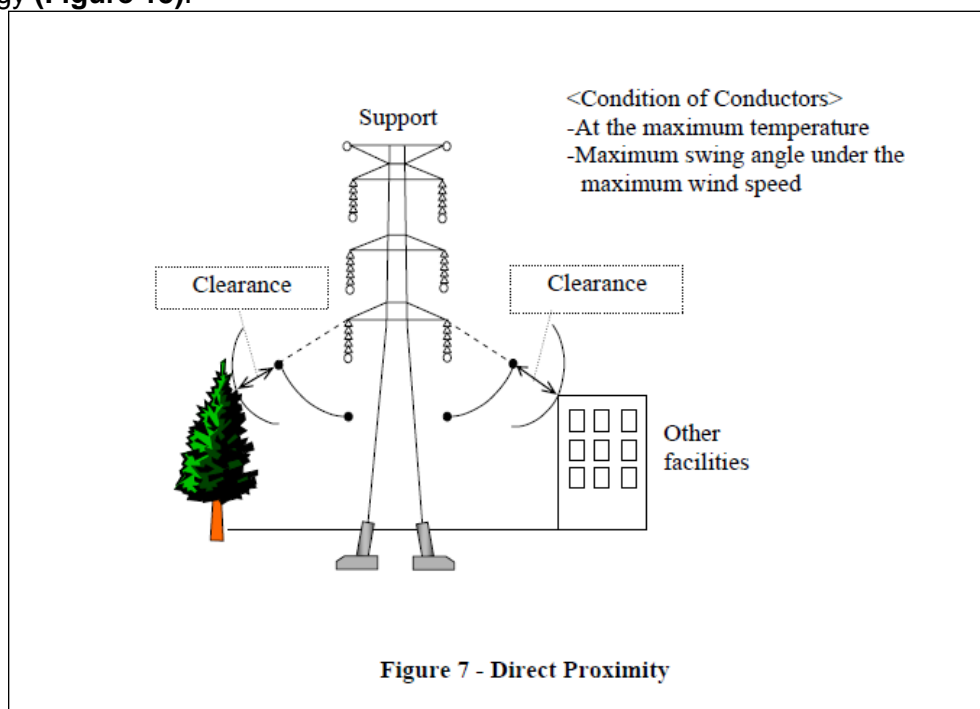


Figure 15. Clearance between Overhead High-voltage Lines and Other Facilities or Trees

57. **For underground part**, the alignment of the cable line mostly goes along the frontage road (dike road) with narrow and crowded inner-city roads. The selection of the route alignment has been considered by the Design Team and EDC, taking into consideration feedbacks from public consultation in Sen Sok, Mean Chhay, Russei Keo and Chamka Mon Khan.

58. The option of cable line going underground is appropriate for the successive construction method. The cables will be installed in the streets or paths using PVC ducts, with underground cable jointing bays every 200m to 300m. On busy roads, the contractor can install the ducts in short sections during the night and reinstate the road so it can be used as normal during the day. Once all the ducts are installed, the cables can be pulled through the ducts from each jointing bay.

59. **For any temporary land acquisition** for site installation or other areas needed for the subproject activities, the contractor will have to propose in a site installation and access plan and obtain approval from the EDC. Where possible, public land will be used for temporary land use. The contractor shall lease the private space with agreed rental fee. Both private and public land shall be returned in the same or improved condition compared with pre-subproject situation. Through a transparent and contractual approach, the EDC will provide the contractor with the

project's land acquisition and compensation principles to ensure that (i) official compensation rates are applied, (ii) re-instatement of affected assets contractually defined, (iii) consultation takes place, (iv) the grievance mechanism is followed, (v) the environmental management plan is applied, and (vi) other items specified are complied with. The requirements for items (i) to (v) for compliance by the contractor and monitoring by the EDC.

2. Current land ownership and use status and anticipated impacts on land

60. In November 2019, the EDC and the team of consultants visited the projects sites in Phnom Penh and Kampong Cham and Kampong Chhang provinces.

- i) the TPP1, TPP2 and TPP3 alignments are planned on the public land such as transportation land, i.e. pavement areas of the roads;
- ii) SPP2 is planned to be located adjacent to waterway which not being used by any household living nearby;
- iii) SPP3 is located on public vacant land;
- iv) for SPP4, it is garbage site, which is public land and there is no impact on waste pickers envisaged, including restriction of access according to the screening activities and consultation with the local authorities and communities; and
- v) SPP5 is planned to be located adjacent to a canal.

61. All subprojects described above will be built on the government land and will not require acquisition of privately owned/used land or assets. In all cases where the substations are located adjacent to the waterways and canals, the contractor will need to carry out geotech drilling to establish the load-bearing properties of the ground conditions - from that the number, depth and type of foundations will be determined. If there is a high-water content, sheet piling to isolate where the pile(s) is/are to go, and if very wet any residue water will be pumped out. For 3 TL subprojects, most of the tower footings are to be placed on government land avoiding private land and all the area proposed for the substations are public land.

Table 3. Summary of Subprojects Impact on the Land

Transmission Lines and Substations in Phnom Penh	Permanent land acquisition impacts			Temporary impacts		Total land
	Number of towers	Area of foundation (m2)	Subtotal (m2)	Restricted land use area (m2)	Temporary impacts	
TPP1	33	40.96	1,351.68	73,648.32	5,460	80,460
TPP2	10	40.96	409.6	14,590.4	3,420	18,420
TPP3	16	40.96	655.36	35,344.64	6,672	42,672
SPP2	0	0	1,800	0	2,250	4,050
SPP3	0	0	800	0	1,000	1,800
SPP4	0	0	1,200	0	1,500	2,700
SPP5	0	0	800	0	1,500	2,700
Total	59	122.8	7,016.64	132,583.36	21,802	152,402

62. A total of 152,402m² land will be affected by the 7 subprojects in which 7,016.64 m² will be permanently acquired for the construction of 4 substations (including access roads to the substations) and 59 monopoles of the 3 TL subprojects. 132,583.36 m² of land will be restricted for land use due to the ROW and 21,802 m² will be temporarily affected by the construction of underground cable (UGC) and 59 monopoles.

63. According to the screening results conducted by the consultants for EDC in November 2019 and January 2020, and based on the information provided by EDC, all of the area above are not being used by any individual household and/or private organization.

Impact on trees

64. The construction of 7 subprojects will affect 159 trees (including 153 timber trees and six mango trees), which will be cut down due to restriction within the ROW. All these trees belong to the Khans.

Impact on structures

65. No structures will be affected.

Impact on business

66. The construction of the UGC will temporarily affect 250 shops along the road No 371. This impact is assessed as site-specific, short-term and can be mitigated by the construction method. As the proposed method of construction, construction activity will be conducted in the night time on the sidewalk, thus, business activities of local people will not be affected; at the same time, the restoration (surface of road and concrete paths) will be conducted within the day/night which helps minimizing the unanticipated impact to households. During construction, successive construction method shall be applied; construction shall be conducted in parts; excavated roads shall be limited and backfilled at the end of the day. These aim to limit adverse effects on the daily life, transportation and business of the people. As construction activities shall be conducted on sidewalks and roadside, the installation of UGC shall not affect business activities or income of households situated on pavements. If there is any emerging impact during the subproject implementation on these households, compensation and supports for losses shall be provided for the affected households as per the LARF of this Project.

F. Information Disclosure and Public Consultation

67. On 18 and 19 November 2019, EDC conducted preliminary consultations with government stakeholders to introduce the proposed substation project and to solicit their views and suggestions. In that consultation, the participants suggested that the project should be in line with Energy Development Master Plan of Cambodia.

68. From 23 January to 4 February 2020, EDC carried out second round of consultation at the all Khans in Phnom Penh with 162 persons representing communes where the transmission lines and substations are located, to discuss the project and to present the preliminary transmission line alignment and the substation locations, ensuring the least adverse social impacts as possible. ***(List of participants is attached to the Appendix 1; and Pictures of public consultations is attached to the Appendix 2 of this report).***

Table 4. Dates of Public Meetings and Consultations

Subproject	Name	Date of consultation	Commune/Khan	Number of Participants		
				Total	Male	Female
TPP2 and SPP5	New 2.44 km 115 kV transmission line from proposed	23 Jan 2020	Russey Keo	38	32	6

	Sen Sok to proposed Russei Keo substations					
TPP3	New 4.4 km 115 kV transmission line from proposed Boeung Tompon substation to new Olympic substation	28 Jan 2020 29 Jan 2020	Toul Tompong 2 Beoung Keng Kang	18 24	13 19	5 5
TPP1 and SPP2	New 230/115/22 kV Sen Sok substation	28 Jan 2020	Phnom Penh Thmei	64	55	9
SPP3	New 230/115 kV RUPP substation	-				
SPP4	New 230/115 kV Boeung Tompon substation	23 Jan 2020	Meanchey	18	17	1
Total				162	136	26

Table 5. Highlights of the Public Consultation

Area	Location	Comments of local authorities and affected person	Feedback from the Representative of the Project Owner and The Consultant Unit
TPP2	New 2.44 km 115 kV transmission line to Russei Keo substation	<p>Q: Is transmission line installed through overhead or underground? If transmission line is installed underground, is there any impacts to local people?</p> <p>Suggestion: 1. The proposed project should be assessed for short- and long-term impacts to ensure sustainability of the project and happiness of local people at the project site.</p> <p>2. Underground transmission line should be installed at the middle of the road, not on the right of way or roadside.</p> <p>The major environmental issues in Khan Russey Keo is solid waste. Waste collection does not function well, and local people do not pack waste and dump waste properly.</p> <p>Note: there are about 99% of households using smart phones/Facebook.</p>	<p>There will be overhead transmission line and underground transmission line; overhead transmission line will be installed along channel or on the right of way where it is not close to residence house. Underground transmission line will be installed at crowded area and it costs more than overhead transmission line two to three times to ensure the safety.</p>
TPP3	Sangkat Toul Tompong 2, New 4.4 km 115 kV transmission line to Boeung Tompon substation	<p>Q: Which side of the road 371, the transmission line will be constructed?</p> <p>Q: Which type of transmission line will be installed?</p> <p>Suggestion: 1. The contractor have to follow environmental management plan strictly and project owner should strictly monitor contractor's performance.</p> <p>There is no major environmental issue in the area, but there are too many TV cable, internet cable, telecommunication cable installing messily on the pole. It makes the view of the city does not look good and risk to fire coincidently</p> <p>Note: there are about 90% of households using smart phones/Facebook.</p>	<p>It has not been finalized yet, it depends on the cost of installation, social and environmental impact and we try to minimize the impacts.</p> <p>Along road 371, it is crowded area, so underground transmission line is suitable for this condition for safety reason and landscape of the city.</p>
TPP3	Khan Boeung Keng Kong New 4.4 km 115 kV	<p>Welcome by deputy governor and also conclusion</p> <p>Is transmission line installed through overhead or underground? If transmission</p>	<p>There will be overhead transmission line and underground transmission line; overhead transmission line will be</p>

Area	Location	Comments of local authorities and affected person	Feedback from the Representative of the Project Owner and The Consultant Unit
	transmission line to new Olympic substation	<p>line is installed underground, is there any impacts to local people?</p> <p>Based on my experience, after digging the ground the contractor does not repair as normal condition, so I have to repair with my own money.</p> <p>How long the construction will take place?</p> <p>The underground line will fall which side of the road? How big of the underground installation is?</p> <p>Q: What are the benefits of the project?</p> <p>Suggestion: 1. Currently, Khan Beung Kengkang is working with Chinese company namely "Cfox" to reinstall all types of overhead cables into underground. Thus, the proposed transmission will be underground as well.</p> <p>2. To minimize impacts on local people and traffic jam, the construction should be done section by section (100m for instance) or find an effective solution.</p> <p>3. If there are any emerging issues during the construction, contractor should be responsive on time. Also, the phone number of construction site manager should be place at the constructing site, so local people or local authority can report directly if there is any emerging issue.</p> <p>4. All comments and suggestions for this consultation meeting should be integrated into IEE report and be considered by planner.</p> <p>5. Suggest to EdC to inform us about exact construction plan in advance before actual construction taking place.</p> <p>There is no major environmental issue</p> <p>Note: there are about 95% of households using smart phones/Facebook.</p>	<p>installed along channel or on the right of way where it is not close to residence house. Underground transmission line will be installed at crowded area and it costs more than overhead transmission line two to three times to ensure the safety.</p> <p>The ADB-funded project requires project owner to look carefully on contractor's performance, rehabilitation to normal condition after construction is required.</p> <p>Since it is an initial phase of assess, the construction period for each location has not been planned yet.</p> <p>It is still under feasibility study; anyways, we try to choose option with less impacts. A: Since it is high voltage line, the deep of underground will be not less than 1 meter.</p> <p>It will ensure the stability of electricity supply in the area, so economic activities will be increased as well.</p>
SPP2	New 230/115/22 kV Sen Sok substation	<p>Welcome by deputy governor to understand more detail about the project and suggest working closely with local authority especially Sangkat Phnom Penh Thmei.</p> <p>Q: Is there any impact from the transmission line?</p> <p>Q: Who will responsible for compensation on the social impacts (resettlement, livelihood and so on)?</p> <p>Suggestion: 1. Project owner should consider and address all comments or suggestion from local authorities</p> <p>2. Suggest installing underground transmission line as much as possible to</p>	<p>A: Along open space or channel, overhead transmission line will be installed as building is now allowed to construct within 7.5m from the transmission line.</p> <p>Underground transmission line will be constructed at crowded area where safety is the most priority as well as landscape in the center of city.</p> <p>A: There is a policy of the ADB to require project owner (EDC) or country member (Royal Government of Cambodia) responsible for compensation</p>

Area	Location	Comments of local authorities and affected person	Feedback from the Representative of the Project Owner and The Consultant Unit
		minimize the impact, especially in Kouk Khlang commune. There is no major environmental issue in the area. Note: there are about 90% of households using smart phones/Facebook.	based on fairness, transparency and market value.
SPP4	Khan Meanchey New 230/115 kV Boeung Tompon substation & transmission line	Welcome project by Deputy Governor, express very important of the project in the area of new development Participants: will there be any negative impacts on households along the transmission line? Has EDC got any local EIA consulting firm to conduct assessment on the proposed project yet? Has EDC conducted any study on underground transmission lines? Any impacts? Do existing transmission lines near the Mean Chhey Hall have any impacts to local people who are living nearby? Request to EDC to install small scale electric pole at the proper place, not in front of their house. Work closely with local authority and should conduct another field visit to see actual affected by invite land management office, transportation service, environmental service to resolve all in one together. Consider some adjustment of transmission line to another government land across old pumping sewage substation. Some road is very narrow; it is required to study of traffic flow.	A. Then overhead transmission line will be installed at open area inside state land to ensure the safeties. The EIA consulting will be hired once the loan is approved. EDC has studied installing underground If the transmission will be constructed along channel, there might be no impacts. The suggestion will bring to consultation with engineering team. We will conduct another focus group discussion with local village live along that canal to get more view the project.

G. Due Diligence of the Associated Facilities to the Subprojects

1. Rationale for due diligence of the associated facilities

69. The following subprojects, namely (i) 230 kV GS5 substation, (ii) 115 kV Olympic substation, and (iii) the underground cable from NCC to Toul Kork and Beung Kok, are considered associated facilities of TPP1, TTP3, and SPP3, respectively. The reasons are that (i) the proposed 6.52 km 230 kV transmission line will transmit power from the existing 230kV GS5 substation to the proposed Sen Sok substation, (ii) the new 4.4 km 115 kV transmission line from proposed Boeung Tompon substation to new Olympic substation, and (iii) the propose 230/115 kV RUPP station will feed the power from 230 kV underground cable from NCC to Toul Kork and Beung Kok.

70. As per ADB 2009 SPS and 2012 A Planning and Implementation Good Practice Sourcebook (para. 21), for a project that is not funded by ADB and may cause involuntary resettlement but is critical to the design or implementation of the ADB project, ADB will carry out due diligence on involuntary resettlement that results from such projects by obtaining information

on how the adverse impacts will be identified and addressed. As the above-listed projects, namely GS5 SS, Olympic SS and the UGC are critical to the design and implementation of the TPP1, TPP3, and SPP3 subprojects, due diligence is thus required to ensure that the land acquisition activities of these projects are in compliance with the SPS 2009 requirements and Cambodian land laws and regulations.

2. Description of the Associated Facilities

a. 230/115/22kV GS5

71. The existing GS5 is located on border between Sangkat Krang Thnong of Khan Po Senchey and Sangkat Phnom Penh Thmei of Khan Sen Sok in the new urban development area. GS5 substation was built in 2013 and completed in 2014. The geographical boundary of the substation is as follows:

- i) bordered to the North by Okha Try Heng 2011 Road;
- ii) bordered to the South by Plov Lum;
- iii) bordered to the West by street number 105K; and
- iv) bordered to the East by sewage/canal Sen Sok.

GRID SUBSTATION NO. 5 (GS5)



Figure 16. Map of GS5 Subproject Location

72. 230kV GS5 SS will supply power for the new urban development in Phnom Penh through the proposed 230/115kV transmission line from GS 5 substation to proposed 230/115 Sen Sok substation. GS5 Substation is owned by EDC and it is location in Pou Senchey District. The total area of substation is about 80,000 m². Main features of the substation are as follows:

- i) voltage level: 115/22 kV and 230/115 kV;
- ii) capacity: transformers with capacity: 115/22kV (3x50 MVA) and 230/115 kV (2x300 MVA);
- iii) selected transformers have vector group: YNd11 (50MVA: ONAN/ONAF); (300MVA: ONAN/ONAF1/ONAF2);
- iv) wiring diagram: 3 phase power transformer;
- v) type of substation: AIS;
- vi) telecommunications system; and
- vii) SCADA system:
 - a) land clearing, compaction, grading, concrete foundation, and drainage system, etc.
 - b) boundary wall and fence, gates.

b. 115 kV Olympic Substation

73. **Location.** New Olympic substation is funded by JICA and its located inside the Olympic Stadium at corner of southeast. The civil work started in 2018. It is expected to be completed in 2020.

Olympic Substation



Figure 17. Map of New Olympic Subproject Location

74. **Feature.** Olympic substation is under construction to supply the power for the newly developed buildings in the area. The location of the New Olympic substation is in Olympic Stadium, Prampir Meakkara District and it occupied 1,560 m² of land. The land for substation development belongs to EDC. Main features of the project are as follows:

- i) voltage level: 115/22 kV;
- ii) capacity: Transformers with capacity: 2x75 MVA;
- iii) selected transformers have vector group. YNd11 (ONAN/ONAF);
- iv) wiring diagram: 3 phases power transformer;
- v) type of substation: GIS;
- vi) telecommunications system; and
- vii) SCADA system.

c. The underground cable from NCC to Toul Kork and Beung Kok

75. The proposed 230/115 kV RUPP station will feed the power from 230 kV underground cable from NCC to Toul Kork and Beung KoK. This UGC is 5 km length and built in 2018. The civil work of this UGC has been completed in 2019. The feature of the 230kV underground cable is presented in table below.

Table 6. Features of the 230kV Underground TL

Components	Technical Specifications
Length of UGC (in km)	5 Km
- Starting point	NCC
- Ending point	Toul Kork and Beung Kok
Width of safety corridor of the UGC	
Voltage level	115 kV
Number of circuits	2
Conductor	XLPE 1x800mm ²

3. Impacts of Associated Facilities

76. Total of acquired land area is 81,560m² for: (i) construction of control house, internal road, guarding house and fence; (ii) construction of water tank for firefighting, emergency oil tank, fire-fighting pumping station and cable trench land; and (iii) tower foundations.

Table 7. Associated Facility Subprojects' Impacts

Associated Facility	Permanently acquired land area (m ²)	Temporarily affected land area (m ²)	Trees	Crops
GS2	80,000	0	0	80,000
New Olympic	1,560	0	0	0
230 kV UGC	0	15,000	0	0
Total	81,560	15,000	0	80,000

77. A total of 81,560 m² land have been acquired for building two substations in which 80,000 m² of agricultural land have been acquired for GS5 substation and 1,560 urban land for the New Olympic substation construction. The construction of UGC 2320 kV from NCC to Toul Kork and Beung KoK was implemented on the transport land of 15,000m².

78. Due to the construction of GS5, 80,000 m² of rice have been affected and there was no tree affected by these subprojects.

79. According to EDC, compensation has been fully implemented and there are no pending issues related to the projects. Please refer to EDC's confirmation on the completion of the land acquisition and compensation for these projects in the **Appendix 3**.

H. Conclusion

80. The seven subprojects, namely TPP1, TPP2, TPP3, SPP2, SPP3, SPP4 and SPP5 will not cause permanent and temporary land acquisition impacts to any household. There is no private house and/or main structure affected by the subproject but impacts on secondary

structures as well as trees. There is also no household affected on their livelihood or income due to the subproject implementation.

81. The DDR is prepared based on ADB 2009 SPS and provisions of the Government's Laws, Regulations and Policies on Land Acquisition. As indicated above, transact walk through the Subproject site validated no LAR requirements of private land as all the proposed subprojects listed above are to be developed on public land. However, contractor may need temporary land acquisition for construction activities. After the detailed engineering design and prior to the implementation of the Subproject, the EDC with the assistance of the PIC will be required to undertake a review of this due diligence, prepare a confirmation letter or report documenting any modifications on any resettlement aspects and submit to ADB, and receive no objection confirmation from ADB prior to the start of construction works.

82. In general, the planning and executing of LAR tasks are mainly related to the preconstruction phase containing (i) detailed engineering design, (ii) bid document preparation and approval, and (iii) procurement of civil works contractor before start of the construction phase. The subproject is estimated to commence its construction from Q4 2020. Any acquisition of land or loss of assets will be verified and confirmed after the detailed engineering design. However, changed layout of the subproject and/or adjustment of the feasibility study design can lead to a change of subproject categorization with respect to the impacts on involuntary resettlement. In the event of this change in classification a resettlement plan will be prepared following the LARF of the Grid Reinforcement Project.

List of Consultation Participants

Date : 23 Jan 2020

Location : Khan Russey Keo, Phnom Penh

ល.រ No	ឈ្មោះ Name	ភេទ Sex	តំណាង /មុខរបរ Position/Occupation	ស្ថាប័ន Organization	លេខទូរស័ព្ទ Phone Number	ហត្ថលេខា Signature
០១	ឈុន ហ៊ុន	ប	ស្រីស្រី/ គណនេយ្យ	ស្រីស្រី	016509805	
០២	លី. ឈាន	ស	សេដ្ឋកិច្ច	ស្រីស្រី	012908951	
០៣	ឡីប ធីត សាន	ប	សាមីស្រី	ស្រីស្រី	092861078	
០៤	ឈីម ឈាន	ប	សេដ្ឋកិច្ច	ស្រីស្រី	012943921	
០៥	ស្រី ស្រី	ប	សេដ្ឋកិច្ច	ស្រីស្រី	012825291	
០៦	ស្រី. ឈាន	ប	សេដ្ឋកិច្ច	ស្រីស្រី	0185734	
០៧	ស្រី. ឈាន	ប	សេដ្ឋកិច្ច	ស្រីស្រី	015689688	
០៨	ស្រី. ឈាន	ប	សេដ្ឋកិច្ច	ស្រីស្រី	012-269829	
០៩	ស្រី. ឈាន	ប	សេដ្ឋកិច្ច	ស្រីស្រី	011278760	
១០	ស្រី. ឈាន	ប	សេដ្ឋកិច្ច	ស្រីស្រី	085848555	
១១	ស្រី. ឈាន	ប	សេដ្ឋកិច្ច	ស្រីស្រី	012706095	
១២	ស្រី. ឈាន	ប	សេដ្ឋកិច្ច	ស្រីស្រី	085797807	
១៣	ស្រី. ឈាន	ប	សេដ្ឋកិច្ច	ស្រីស្រី	012.922636	
១៤	ស្រី. ឈាន	ប	សេដ្ឋកិច្ច	ស្រីស្រី	012.681233	
១៥	ស្រី. ឈាន	ប	សេដ្ឋកិច្ច	ស្រីស្រី	017655776	
១៦	ស្រី. ឈាន	ប	សេដ្ឋកិច្ច	ស្រីស្រី	095306569	
១៧	ស្រី. ឈាន	ប	សេដ្ឋកិច្ច	ស្រីស្រី	017521227	
១៨	ស្រី. ឈាន	ប	សេដ្ឋកិច្ច	ស្រីស្រី	07338752	
១៩	ស្រី. ឈាន	ប	សេដ្ឋកិច្ច	ស្រីស្រី	012875388	
២០	ស្រី. ឈាន	ប	សេដ្ឋកិច្ច	ស្រីស្រី	012478206	
២១	ស្រី. ឈាន	ប	សេដ្ឋកិច្ច	ស្រីស្រី	012708707	
២២	ស្រី. ឈាន	ប	សេដ្ឋកិច្ច	ស្រីស្រី	012855242	
២៣	ស្រី. ឈាន	ប	សេដ្ឋកិច្ច	ស្រីស្រី	077329326	
២៤	ស្រី. ឈាន	ប	សេដ្ឋកិច្ច	ស្រីស្រី	012375291	
២៥	ស្រី. ឈាន	ប	សេដ្ឋកិច្ច	ស្រីស្រី	012539039	

ល.រ No	ឈ្មោះ Name	ភេទ Sex	តំណាង /មុខរបរ Position/Occupation	ស្ថាប័ន Organization	លេខទូរស័ព្ទ Phone Number	ហត្ថលេខា Signature
26	ស៊ី គុណ	ប	មេធាវី	ស្ថាប័ន-1	011247768	
27	ស៊ី ហ៊ុន	ប	មេធាវី	ស្ថាប័ន-1	011772269	
28	ស៊ី គុណ	ប	មេធាវី	ស្ថាប័ន-1	011417553	
29	ស៊ី ហ៊ុន	ប	មេធាវី	ស្ថាប័ន-1	078821686	
30	ស៊ី គុណ	ប	មេធាវី	ស្ថាប័ន-1	093269009	
31	ស៊ី ហ៊ុន	ប	មេធាវី	ស្ថាប័ន-1	017521227	
32	ស៊ី គុណ	ប	មេធាវី	ស្ថាប័ន-1	012697346	
34	ស៊ី គុណ	ប	មេធាវី	ស្ថាប័ន-1	077500055	
35	ស៊ី គុណ	ប	មេធាវី	ស្ថាប័ន-1	016474832	
36	ស៊ី គុណ	ប	មេធាវី	ស្ថាប័ន-1	017593345	
37	ស៊ី គុណ	ប	មេធាវី	ស្ថាប័ន-1	017624679	
38	ស៊ី គុណ	ប	មេធាវី	ស្ថាប័ន-1	012-594773	
39	ស៊ី គុណ	ប	មេធាវី	ស្ថាប័ន-1	012734125	

Date : 23 Jan 2020

Location : Khan Meanchey, Phnom Penh

ល.រ No	ឈ្មោះ Name	ភេទ Sex	តំណាង /មុខរបរ Position/Occupation	ស្ថាប័ន Organization	លេខទូរស័ព្ទ Phone Number	ហត្ថលេខា Signature
1.	ឧ. វិជិត	ប្រុស	អគ្គិសនី	រដ្ឋបាល	012555581	
2.	ប្រ. ឈុន	ប្រុស	ឧបនាយករដ្ឋមន្ត្រី	រដ្ឋបាល	017463336	
3.	ប្រ. ឈុន	ប្រុស	អគ្គិសនី	រដ្ឋបាល	095757575	
4.	ប្រ. ឈុន	ប្រុស	អគ្គិសនី	រដ្ឋបាល	078743547	
5.	ប្រ. ឈុន	ប្រុស	អគ្គិសនី	រដ្ឋបាល	093.611286	
6.	ប្រ. ឈុន	ប្រុស	អគ្គិសនី	រដ្ឋបាល		
7.	ប្រ. ឈុន	ប្រុស	អគ្គិសនី	រដ្ឋបាល		
8.	ប្រ. ឈុន	ប្រុស	អគ្គិសនី	រដ្ឋបាល		
9.	ប្រ. ឈុន	ប្រុស	អគ្គិសនី	រដ្ឋបាល		
10.	ប្រ. ឈុន	ប្រុស	អគ្គិសនី	រដ្ឋបាល		
11.	ប្រ. ឈុន	ប្រុស	អគ្គិសនី	រដ្ឋបាល		
12.	ប្រ. ឈុន	ប្រុស	អគ្គិសនី	រដ្ឋបាល		
13.	ប្រ. ឈុន	ប្រុស	អគ្គិសនី	រដ្ឋបាល		
14.	ប្រ. ឈុន	ប្រុស	អគ្គិសនី	រដ្ឋបាល		
15.	ប្រ. ឈុន	ប្រុស	អគ្គិសនី	រដ្ឋបាល		
16.	ប្រ. ឈុន	ប្រុស	អគ្គិសនី	រដ្ឋបាល		
17.	ប្រ. ឈុន	ប្រុស	អគ្គិសនី	រដ្ឋបាល		
18.	ប្រ. ឈុន	ប្រុស	អគ្គិសនី	រដ្ឋបាល		

Date : 28 Jan 2020

Location : Sangkat Toul Tompong 2, Khan Chamkar Mon, Phnom Penh

ល.រ No	ឈ្មោះ Name	ភេទ Sex	តំណាង /មុខរបរ Position/Occupation	ស្ថាប័ន Organization	លេខទូរស័ព្ទ Phone Number	ហត្ថលេខា Signature
1	គុំសុវណ្ណា	ប្រុស	មន្ត្រីប្រតិបត្តិការ		092806510	[Signature]
2	ហ៊ុន ហួន	ប្រុស	គណនេយ្យ		012917880	[Signature]
3	ហ៊ុន ហួន	ប្រុស	អគ្គនាយក		078-883588	[Signature]
4	លី ឈីន	ស្រី	ប្រធានក្រុម		077657090	[Signature]
5	ប៊ុន ហួន	ប្រុស	ប្រធានក្រុម		012835431	[Signature]
6	ហ៊ុន ហួន	ប្រុស	ប្រធានក្រុម		070631218	[Signature]
7	ហ៊ុន ហួន	ប្រុស	ប្រធានក្រុម		07-778333	[Signature]
8	ហ៊ុន ហួន	ប្រុស	ប្រធានក្រុម		011-600689	[Signature]
9	ហ៊ុន ហួន	ប្រុស	ប្រធានក្រុម		012916471	[Signature]
10	ហ៊ុន ហួន	ប្រុស	ប្រធានក្រុម		0100418	[Signature]
11	ហ៊ុន ហួន	ប្រុស	ប្រធានក្រុម		078-883588	[Signature]
12	ហ៊ុន ហួន	ប្រុស	ប្រធានក្រុម		07777780	[Signature]
13	ហ៊ុន ហួន	ប្រុស	ប្រធានក្រុម		093261000	[Signature]
14	ហ៊ុន ហួន	ប្រុស	ប្រធានក្រុម		077667455	[Signature]
15	ហ៊ុន ហួន	ប្រុស	ប្រធានក្រុម		011797863	[Signature]
16	ហ៊ុន ហួន	ប្រុស	ប្រធានក្រុម		07829856	[Signature]
17	ហ៊ុន ហួន	ប្រុស	ប្រធានក្រុម		078743377	[Signature]
18	ហ៊ុន ហួន	ប្រុស	ប្រធានក្រុម		01-930301	[Signature]

Date : 28 Jan 2020

Location : Khan Sen Sok, Phnom Penh

ល.រ	ឈ្មោះ	ភេទ	តួនាទី	លេខទូរស័ព្ទ	ហត្ថលេខា
១	ក. ណា ណា	ប	លេខាធិការ	០១២៣៣៨២៣	
២	លោក ណា	ប	លេខាធិការ	០៩២៩៩០០៦១	
៣	លោក ណា	ប	លេខាធិការ	០១២៩៦៩២១	
៤	លោក ណា	ប	លេខាធិការ	០៨៥៣៨៩៨២៨	
៥	លោក ណា	ប	លេខាធិការ	០៩២៦៦៩២១	
៦	លោក ណា	ប	លេខាធិការ	០១៥៩០៦០៦	
៧	លោក ណា	ប	លេខាធិការ	០១១៤៥៨៩៧	
៨	លោក ណា	ប	លេខាធិការ	០១១២៤៥៦៧	
៩	លោក ណា	ប	លេខាធិការ	០១២៧៧៨៩០	
១០	លោក ណា	ប	លេខាធិការ	០១២៩៩៩៨៨	
១១	លោក ណា	ប	លេខាធិការ	០៩៩៩៩៩៩៩	
១២	លោក ណា	ប	លេខាធិការ	០១៧៩៧៧៨៩	
១៣	លោក ណា	ប	លេខាធិការ	០៨៩៨៥៨១៨	
១៤	លោក ណា	ប	លេខាធិការ	០១២៨៨៤២៥៨	
១៥	លោក ណា	ប	លេខាធិការ	០១២២៥២០០	
១៦	លោក ណា	ប	លេខាធិការ	០៨១៤៥៤៦៧	
១៧	លោក ណា	ប	លេខាធិការ	០១១៤៥៥០៦៧	
១៨	លោក ណា	ប	លេខាធិការ	០១២៧៤៥៩០៨	
១៩	លោក ណា	ប	លេខាធិការ	០១២៦៩៩៧៨	
២០	លោក ណា	ប	លេខាធិការ	០១២៦៩៩៧៨	
២១	លោក ណា	ប	លេខាធិការ	០១២៦៩៩៧៨	
២២	លោក ណា	ប	លេខាធិការ	០០៩៨៣៩៩៧	

46	කි.පී. ආර්ථික	ක	කුසලාන සිංහලාන	017 526 797	Prade
47	කි.පී. ආර්ථික	ක	කුසලාන සිංහලාන	011 619 701	කුසලාන
48	කි.පී. ආර්ථික	ක	කුසලාන සිංහලාන	089 712 413	කුසලාන
49	කි.පී. ආර්ථික	ක	කුසලාන සිංහලාන	012 694 074	කුසලාන
50	කි.පී. ආර්ථික	ක	කුසලාන සිංහලාන	082 02 02 70	කුසලාන
51	කි.පී. ආර්ථික	ක	කුසලාන සිංහලාන	089 836 404	කුසලාන
52	කි.පී. ආර්ථික	ක	කුසලාන සිංහලාන	012 723 005	කුසලාන
53	කි.පී. ආර්ථික	ක	කුසලාන සිංහලාන	011 72 62 82	කුසලාන
54	කි.පී. ආර්ථික	ක	කුසලාන සිංහලාන	087 337 799	කුසලාන
55	කි.පී. ආර්ථික	ක	කුසලාන සිංහලාන	070 676 719	කුසලාන
56	කි.පී. ආර්ථික	ක	කුසලාන සිංහලාන	096 317 116	කුසලාන
57	කි.පී. ආර්ථික	ක	කුසලාන සිංහලාන	017 79 29 59	කුසලාන
58	කි.පී. ආර්ථික	ක	කුසලාන සිංහලාන	012 849 05	කුසලාන
59	කි.පී. ආර්ථික	ක	කුසලාන සිංහලාන	099 752 147	කුසලාන
60	කි.පී. ආර්ථික	ක	කුසලාන සිංහලාන	011 75 88 81	කුසලාන
61	කි.පී. ආර්ථික	ක	කුසලාන සිංහලාන	012 632 679	කුසලාන
62	කි.පී. ආර්ථික	ක	කුසලාන සිංහලාන	017 886 066	කුසලාන
63	කි.පී. ආර්ථික	ක	කුසලාන සිංහලාන	015 888 139	කුසලාන
64	කි.පී. ආර්ථික	ක	කුසලාන සිංහලාන	016 793 066	කුසලාන
65	කි.පී. ආර්ථික	ක	කුසලාන සිංහලාන	092 634 553	කුසලාන
66	කි.පී. ආර්ථික	ක	කුසලාන සිංහලාන	016 550 013	කුසලාන
67	කි.පී. ආර්ථික	ක	කුසලාන සිංහලාන	012 886 718	කුසලාන
68	කි.පී. ආර්ථික	ක	කුසලාන සිංහලාන	012 440 395	කුසලාන
69	කි.පී. ආර්ථික	ක	කුසලාන සිංහලාන	012 973 008	කුසලාන
70	කි.පී. ආර්ථික	ක	කුසලාන සිංහලාන	016 889 45	කුසලාන
71	කි.පී. ආර්ථික	ක	කුසලාන සිංහලාන	077 514 222	කුසලාන
72	කි.පී. ආර්ථික	ක	කුසලාන සිංහලාන	012 854 377	කුසලාන
73	කි.පී. ආර්ථික	ක	කුසලාන සිංහලාන	092 776 057	කුසලාන
74	කි.පී. ආර්ථික	ක	කුසලාන සිංහලාන	017 611 377	කුසලාන
75	කි.පී. ආර්ථික	ක	කුසලාන සිංහලාන	016 321 47	කුසලාන
76	කි.පී. ආර්ථික	ක	කුසලාන සිංහලාන	012 884 321	කුසලාන
77	කි.පී. ආර්ථික	ක	කුසලාන සිංහලාන	011 421 593	කුසලාන

	විවේක. හැට්ට	ච	හාමිමල්ල	016882039	හැට්ට
56	හැට්ට වීර	ච	වීරමල්ල	011898933	හැට්ට
57	චාම. හැට්ට	ච	විජයමල්ල	013700237	හැට්ට
58	චාම. හැට්ට	ච	හැට්ට/විජය	015212384	හැට්ට
59	චාම. හැට්ට	ච	විජයමල්ල	012380386	හැට්ට
60	චාම. හැට්ට	ච	විජයමල්ල	017319885	හැට්ට
61	චාම. හැට්ට	ච	විජයමල්ල	011556930	හැට්ට
62	චාම. හැට්ට	ච	විජයමල්ල	011660370	හැට්ට
63	චාම. හැට්ට	ච	විජයමල්ල	012167196	හැට්ට
64	චාම. හැට්ට	ච	විජයමල්ල		හැට්ට

Date : 29 Jan 2020

Location : Khan Beng Keng Kang, Phnom Penh

ល.រ No	ឈ្មោះ Name	ភេទ Sex	តំណាង /មុខរបរ Position/Occupation	ស្ថាប័ន Organization	លេខទូរស័ព្ទ Phone Number	ហត្ថលេខា Signature
1	លី ឈុន ឈុន	ប្រុស	បុគ្គលិក/គ្រូបង្រៀន	វិទ្យាស្ថាន/សាកលវិទ្យាល័យ	012 898 568	លី
2	លី ឈុន ឈុន	ប្រុស	បុគ្គលិក/គ្រូបង្រៀន	វិទ្យាស្ថាន/សាកលវិទ្យាល័យ	097 44 2713	លី
3	លី ឈុន ឈុន	ប្រុស	បុគ្គលិក/គ្រូបង្រៀន	វិទ្យាស្ថាន/សាកលវិទ្យាល័យ	019 930 024	លី
4	លី ឈុន ឈុន	ប្រុស	បុគ្គលិក/គ្រូបង្រៀន	វិទ្យាស្ថាន/សាកលវិទ្យាល័យ	017 997 776	លី
5	លី ឈុន ឈុន	ប្រុស	បុគ្គលិក/គ្រូបង្រៀន	វិទ្យាស្ថាន/សាកលវិទ្យាល័យ	085 873 412	លី
6	លី ឈុន ឈុន	ប្រុស	បុគ្គលិក/គ្រូបង្រៀន	វិទ្យាស្ថាន/សាកលវិទ្យាល័យ	011 848 871	លី
7	លី ឈុន ឈុន	ប្រុស	បុគ្គលិក/គ្រូបង្រៀន	វិទ្យាស្ថាន/សាកលវិទ្យាល័យ	012 670 267	លី
8	លី ឈុន ឈុន	ប្រុស	បុគ្គលិក/គ្រូបង្រៀន	វិទ្យាស្ថាន/សាកលវិទ្យាល័យ	011 669 933	លី
9	លី ឈុន ឈុន	ប្រុស	បុគ្គលិក/គ្រូបង្រៀន	វិទ្យាស្ថាន/សាកលវិទ្យាល័យ	077 949 939	លី
10	លី ឈុន ឈុន	ប្រុស	បុគ្គលិក/គ្រូបង្រៀន	វិទ្យាស្ថាន/សាកលវិទ្យាល័យ	011 933 109	លី
11	លី ឈុន ឈុន	ប្រុស	បុគ្គលិក/គ្រូបង្រៀន	វិទ្យាស្ថាន/សាកលវិទ្យាល័យ	011 780 588	លី
12	លី ឈុន ឈុន	ប្រុស	បុគ្គលិក/គ្រូបង្រៀន	វិទ្យាស្ថាន/សាកលវិទ្យាល័យ	077 733 973	លី
13	លី ឈុន ឈុន	ប្រុស	បុគ្គលិក/គ្រូបង្រៀន	វិទ្យាស្ថាន/សាកលវិទ្យាល័យ	092 779 267	លី
14	លី ឈុន ឈុន	ប្រុស	បុគ្គលិក/គ្រូបង្រៀន	វិទ្យាស្ថាន/សាកលវិទ្យាល័យ	012 587 181	លី
15	លី ឈុន ឈុន	ប្រុស	បុគ្គលិក/គ្រូបង្រៀន	វិទ្យាស្ថាន/សាកលវិទ្យាល័យ	012 993 300	លី
16	លី ឈុន ឈុន	ប្រុស	បុគ្គលិក/គ្រូបង្រៀន	វិទ្យាស្ថាន/សាកលវិទ្យាល័យ	095 225 666	លី
17	លី ឈុន ឈុន	ប្រុស	បុគ្គលិក/គ្រូបង្រៀន	វិទ្យាស្ថាន/សាកលវិទ្យាល័យ	012 618 283	លី
18	លី ឈុន ឈុន	ប្រុស	បុគ្គលិក/គ្រូបង្រៀន	វិទ្យាស្ថាន/សាកលវិទ្យាល័យ	017 777 701	លី
19	លី ឈុន ឈុន	ប្រុស	បុគ្គលិក/គ្រូបង្រៀន	វិទ្យាស្ថាន/សាកលវិទ្យាល័យ	077 887 188	លី
20	លី ឈុន ឈុន	ប្រុស	បុគ្គលិក/គ្រូបង្រៀន	វិទ្យាស្ថាន/សាកលវិទ្យាល័យ	011 812 234	លី
21	លី ឈុន ឈុន	ប្រុស	បុគ្គលិក/គ្រូបង្រៀន	វិទ្យាស្ថាន/សាកលវិទ្យាល័យ	078 666 627	លី
22	លី ឈុន ឈុន	ប្រុស	បុគ្គលិក/គ្រូបង្រៀន	វិទ្យាស្ថាន/សាកលវិទ្យាល័យ	017 777 701	លី
23	លី ឈុន ឈុន	ប្រុស	បុគ្គលិក/គ្រូបង្រៀន	វិទ្យាស្ថាន/សាកលវិទ្យាល័យ	011 812 234	លី
24	លី ឈុន ឈុន	ប្រុស	បុគ្គលិក/គ្រូបង្រៀន	វិទ្យាស្ថាន/សាកលវិទ្យាល័យ	011 812 234	លី

Pictures of Public Consultations



Stakeholder and public consultation in Khan Russei Keo



Stakeholder and public consultation in Khan Meanchey



Stakeholder and public consultation in Khan Boung Keng Kang



Stakeholder and public consultation in Khan Sangkat Prateah Lang



Stakeholder and public consultation in Trapang Sap

EDC Letter to Phnom Penh Municipality Governor on Public Land Request for the Development of Proposed Substations



ព្រះរាជាណាចក្រកម្ពុជា
ជាតិ សាសនា ព្រះមហាក្សត្រ

អគ្គិសនីកម្ពុជា

លេខ: ២០២៤ អន.អន.ជេលក

ថ្ងៃ ពុធ ២០ ១០ ២០២៤ ខែ ត្រាវិច្ឆ័យ ឯកស័ក ព.ស ២៥៦៣
រាជធានីភ្នំពេញ, ថ្ងៃទី ១៦ ខែ សីហា ឆ្នាំ២០២៤

គោរពជូន

ឯកឧត្តមអភិបាល នៃគណៈអភិបាលរាជធានីភ្នំពេញ

កម្មវត្ថុ ៖ សំណើសុំទីតាំងដីរដ្ឋ ចំនួន ០៤ កន្លែង ដែលមានទីតាំង ស្ថិតក្នុងរាជធានីភ្នំពេញ ដើម្បីធ្វើការសាងសង់
អនុស្ថានីយថ្មី ទំនើបក្នុងអគារ តង់ស្យុង ១១៥/២២ គីឡូវ៉ុល ចំនួន ០៣ កន្លែង និង ២៣០/១១៥/២២
គីឡូវ៉ុល មួយកន្លែង។

យោង ៖ តម្រូវការចាំបាច់លើការផ្គត់ផ្គង់ថាមពលដល់រាជធានីភ្នំពេញ។

សេចក្តីដូចមានចែងក្នុងកម្មវត្ថុ និងយោងខាងលើ ខ្ញុំសូមជម្រាបជូន ឯកឧត្តមអភិបាល មេត្តាជ្រាបថា៖
ក្រោមការដឹកនាំដ៏ឈ្លាសវៃរបស់រាជរដ្ឋាភិបាល បានធ្វើឲ្យសេដ្ឋកិច្ចជាតិកើនឡើងយ៉ាងឆាប់រហ័សលើគ្រប់វិស័យ ជា
ពិសេសនៅតាមតំបន់ប៉ូលសេដ្ឋកិច្ចសំខាន់ៗ ដូចជា៖ រាជធានីភ្នំពេញ ក្រុងព្រះសីហនុ ច្រកព្រំដែនអន្តរជាតិសំខាន់ៗ
ជាមួយប្រទេសជិតខាងជាដើម។ សម្រាប់រាជធានីភ្នំពេញក្នុងពេលថ្មីៗនេះ បានកើនឡើងនូវសំណង់អគារពាណិជ្ជកម្ម
ឧស្សាហកម្ម សណ្ឋាគារ តំបន់សេដ្ឋកិច្ចពិសេស ទេសចរណ៍ និងហេដ្ឋារចនាសម្ព័ន្ធថ្មីជាច្រើនទៀត ដែលធ្វើឲ្យ
កំណើននៃការប្រើប្រាស់អគ្គិសនីកើនឡើងយ៉ាងឆាប់រហ័ស។ ការផ្គត់ផ្គង់ថាមពលអគ្គិសនីបច្ចុប្បន្ន គឺចេញពីអនុស្ថានីយ
ចំនួន ១០ កន្លែង ដែលមានកម្លាំងប្រមាណ ១០០០ មេហ្គាវ៉ាត់។ បន្ថែមពីនេះ កំណើនប្រើប្រាស់នៅតែបន្តដោយ
មានការស្នើសុំភ្ជាប់កម្លាំងប្រើប្រាស់ថ្មីៗជាច្រើន ដែលនឹងធ្វើឲ្យមានការលើសពីកម្លាំងផ្គត់ផ្គង់ចេញពីអនុស្ថានីយ
ទាំងនោះ ហើយតាមលក្ខណៈបច្ចេកទេសសេដ្ឋកិច្ចក៏មិនអាចបន្ថែមកម្លាំងត្រង់ស្រូម៉ាទ័របានទៀតនៅទីតាំងអនុស្ថានីយ
ដែលមានស្រាប់បានទេ ព្រោះថាមួយឆ្នាំយើងបន្តប្រើប្រាស់ធ្វើឲ្យបាត់បង់ថាមពលខ្ពស់ពុំមានស្ថិរភាព និរន្តរភាព ក៏
ដូចជាគុណភាពនៃការផ្គត់ផ្គង់។ ដូច្នេះដើម្បីផ្គត់ផ្គង់ឲ្យបានតាមតម្រូវការខាងលើ និងសម្រាប់អនាគត អគ្គិសនីកម្ពុជា
ត្រូវសាងសង់អនុស្ថានីយ ១០ កន្លែង ថ្មីបន្ថែមទៀត សម្រាប់រាជធានីភ្នំពេញ និងតំបន់ជុំវិញក្នុងឆ្នាំ២០១៩-២០២៤
ដែលក្នុងនោះ ០៤ កន្លែង មានទីតាំងនៅក្បែរ៖ ក. ផ្សារទំនើបអ៊ីអេសម៉លទី២ ខណ្ឌសែនសុខ ខ. សង្កាត់ទួលសង្កែ
ខណ្ឌឫស្សីកែវ គ. ត្រពាំងកែវ ខណ្ឌទួលគោក និង ឃ. សង្កាត់បឹងទំពុន ខណ្ឌមានជ័យ តាមការសិក្សា ទីតាំងទាំង
នេះមានសារៈសំខាន់ណាស់ ដែលត្រូវសាងសង់អនុស្ថានីយខាងលើ ដើម្បីផ្តល់លទ្ធភាពផ្គត់ផ្គង់ថាមពលជូនរាជធានី
ភ្នំពេញ។

ដោយទីតាំងទាំងនេះពិបាកក្រ ព្រមទាំងដីមានតម្លៃខ្ពស់នោះ ដើម្បីកាត់បន្ថយចំណាយថវិការបស់រដ្ឋក្នុង
ការទិញដី ក៏ដូចជាសន្សំថវិកានេះ យកទៅវិនិយោគសាងសង់ហេដ្ឋារចនាសម្ព័ន្ធអនុស្ថានីយនេះ ដែលត្រូវការថវិកា
ប្រមាណជាង ៥០ លានដុល្លារអាមេរិក អគ្គិសនីកម្ពុជាសូមស្នើសុំ ឯកឧត្តមអភិបាល មេត្តាពិនិត្យលទ្ធភាពក្នុងការផ្តល់
ទីតាំងដីរដ្ឋដែលស្ថិតនៅទីតាំងចំនួន ០៤ កន្លែង ដូចខាងក្រោម៖

- ១) ទីតាំងទី១: សម្រាប់សាងសង់អនុស្ថានីយសែនសុខ តង់ស្យុង ២៣០/១១៥/២២ គីឡូវ៉ុល មានទំហំដី ២០០០ ម៉ែត្រការ៉េ (២៥ ម៉ែត្រ x ៨០ ម៉ែត្រ) ស្ថិតនៅក្បែរផ្សារទំនើបអ៊ីអនម៉លទី២ ដែលជាទីតាំងលើប្រឡាយ ដែលអគ្គិសនីកម្ពុជាសាងសង់ពីលើ និងទុកឲ្យទឹកហូរនៅខាងក្រោមបាន។
- ២) ទីតាំងទី២: សម្រាប់សាងសង់អនុស្ថានីយឬស្សីកែវ តង់ស្យុង ១១៥/២២ គីឡូវ៉ុល មានទំហំដី ១៥០០ ម៉ែត្រការ៉េ (៣០ ម៉ែត្រ x ៥០ ម៉ែត្រ) ស្ថិតនៅសង្កាត់ទួលសង្កែ ក្បែរវត្តទួលសន្តិវិន័យ។
- ៣) ទីតាំងទី៣: សម្រាប់សាងសង់អនុស្ថានីយត្រច្នោកបែក តង់ស្យុង ១១៥/២២ គីឡូវ៉ុល មានទំហំដី ១៥០០ ម៉ែត្រការ៉េ (៣០ ម៉ែត្រ x ៥០ ម៉ែត្រ) ស្ថិតនៅក្បែរសកលវិទ្យាល័យភូមិន្ទភ្នំពេញ។
- ៤) ទីតាំងទី៤: សម្រាប់សាងសង់អនុស្ថានីយបឹងទំពុន តង់ស្យុង ១១៥/២២ គីឡូវ៉ុល មានទំហំដី ២៤០០ ម៉ែត្រការ៉េ (៤០ ម៉ែត្រ x ៦០ ម៉ែត្រ) ស្ថិតនៅក្បែរស្ថានីយបូមទឹកបឹងទំពុន ដែលជាទីតាំងមាត់បឹង។

(សូមភ្ជាប់ជូនផែនទីទីតាំងដែលស្នើសុំ)។

អាស្រ័យដូចបានជម្រាបជូនខាងលើ សូមឯកឧត្តមអភិបាល មេត្តាពិនិត្យ និងអនុញ្ញាតផ្តល់ទីតាំងដីខាងលើ ដោយក្តីអនុគ្រោះ។

សូមឯកឧត្តមអភិបាល មេត្តាទទួលនូវការគោរពរាប់អានដ៏ជ្រាលជ្រៅពីខ្ញុំ។ *Handwritten signature*

**រដ្ឋមន្ត្រីប្រតិភូអមនាយករដ្ឋមន្ត្រី
អគ្គនាយកអគ្គិសនីកម្ពុជា** *Handwritten signature*



កែវ-រតនៈ

Map of Sensok Substation



ទីតាំងដីស្នើសុំសម្រាប់សាងសង់ អនុស្សាវរីយ៍ស្រែនសុខ ទំហំ 2,000m² (25m x 80m)



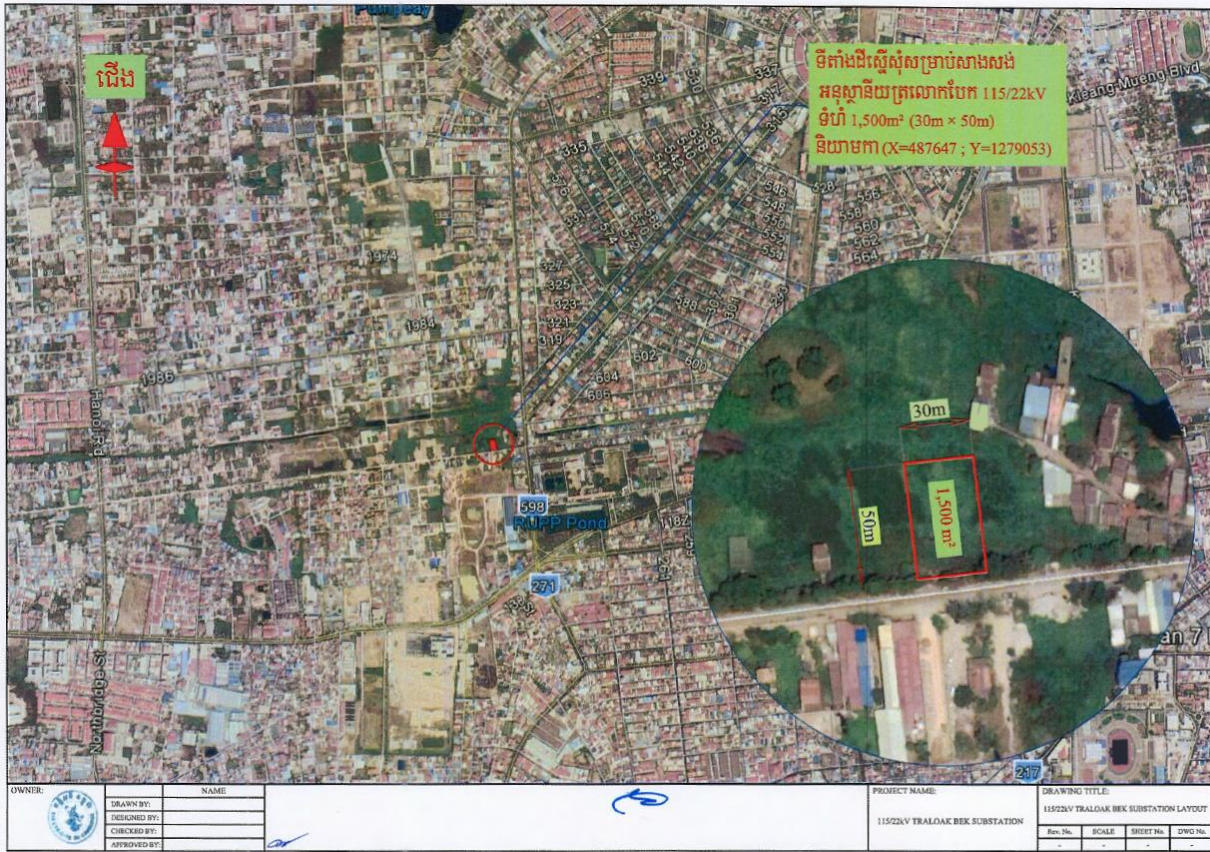
Map of Reussey Keo Substation



ទីតាំងដីស្នើសុំសម្រាប់សាងសង់ អនុស្ថានីយប្រព័ន្ធកែវ ទំហំ 1,500m² (30m x 50m)



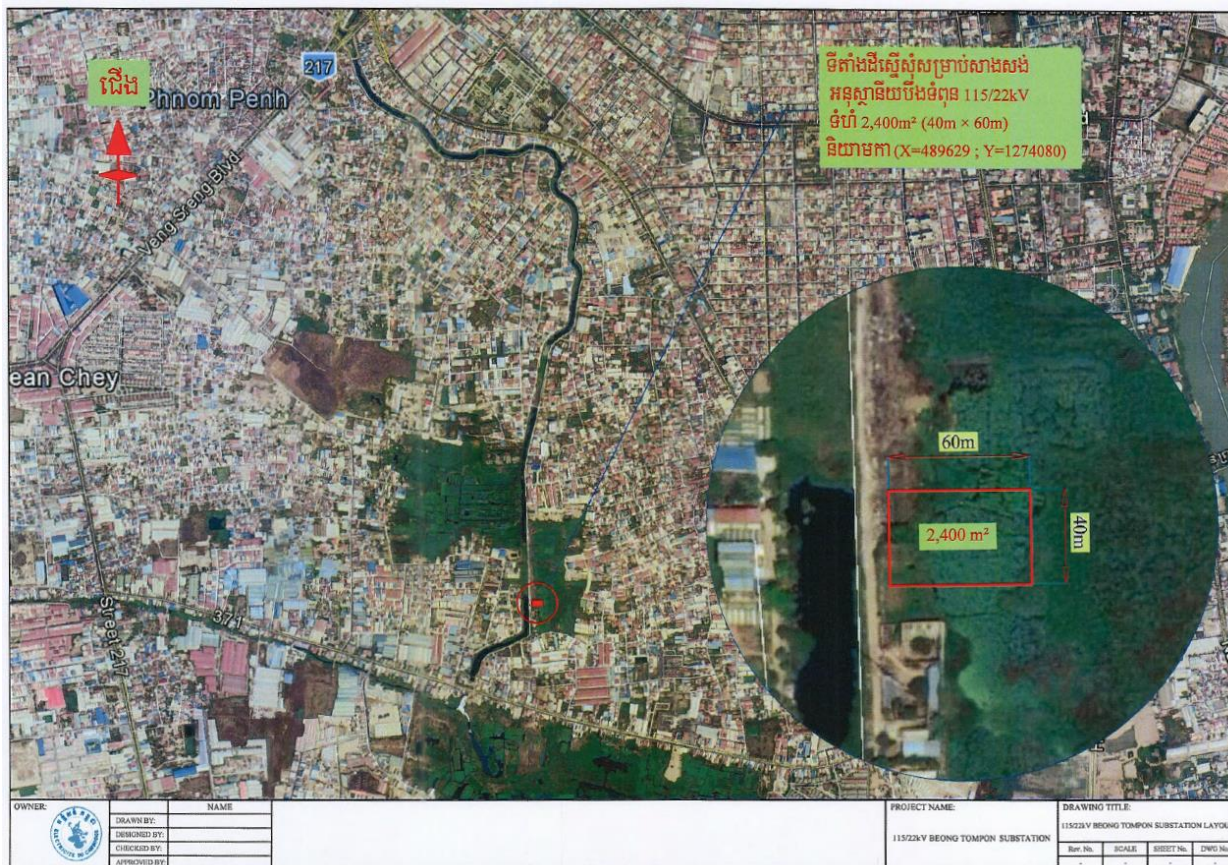
Traloak Baek RUPP Substation



ទីតាំងដីស្នើសុំសម្រាប់សាងសង់ អនុស្ថានីយត្រួតពិនិត្យ ទំហំ 1,500m² (30m x 50m)



Map of Boeung Tompon Substation



ទីតាំងដីស្នើសុំសម្រាប់សាងសង់ អនុស្ថានីយបឹងទំពុន ទំហំ 2,400m² (40m x 60m)



English translation:

Kingdom of Cambodia
Nation Religion King

EDC

No. 6066 Phnom Penh, Date 16 August 2019

Dear H.E. Governor of the Phnom Penh Municipality

Subject: Request state land for 4 locations in Phnom Penh for the construction of 3 115/22 kV substations and one 230/115/22 kV substation.

Reference: The need for electricity supply in Phnom Penh municipality.

In response to subject and reference, I would like to inform H.E the Governor and Governor that, under the leadership of the Royal Government, there has been rapid growth in all sectors, especially the main economic zone such as the Phnom Penh municipality, Sihanoukville, International border corridors with neighboring countries.

Particularly in Phnom Penh, there has recently been an increase in the construction of commercial buildings, hotels, special economic zones, tourism and other new infrastructure, which is rapidly increasing in electricity consumption. The current power supply comes from 10 existing substations with approximately 1,000 megawatts. In addition, increased consumption will continue with the introduction of new large-scale power consumption that will outstrip supply from those substations and technically, the economy cannot add power to the substation transformer on the existing because the distance to the power supply makes the high energy loss unsustainable as well as the quality of the equipment. Therefore, to meet the above requirements and for the future of electricity, EDC needs to build 10 new substations for Phnom Penh and its surrounding areas during the year for 2019-2024 which include 4 locations near AEON2 Sensok supermarket, Sangkat Toul Sangke of Khan Russey Keo, Traloak Baek of Khan Toul Kok and Beoung Tompon of Khan Meanchey. Based on the study, these areas are very important to construct new substation to supply electricity for Phnom Penh municipality.

Due to difficulty to find location, land very expensive and to reduce government expense to buy land to save the money to invest on the facility of those substations which require approximately 50 million US Dollars. The EDC would like to request Excellency Governor provide those 4 locations described below:

1. Sensok Substation 230/115/22 kV size 2000m² (25m x 80m) near AEON2 supermarket, construct substation on stream and keep water flow underground
2. Russey Keo substation 115/22 kV size 1500m² (30m x 50m) location Toul Sangke near Toul Santhiwan pagoda.
3. Traolok Baek [RUPP] Substation 115/22 kV size 1500m² (30m x 50m) near Royal University of Phnom Penh (RUPP)
4. Boeung Tompon Substation 115/22 kV size 2400m² (40m x 60m) near sewage pumping station Boeung Tompon lake.
(with annex map of specific location)

With descriptions above, please kindly consideration and provide the land per request.

Please accept, Excellency, the assurance of my highest consideration.

H.E. Keo Rottanak
Minister Attached to the Prime Minister
Managing Director

Confirmation of Electricite du Cambodge's Commitment

KINGDOM OF CAMBODIA
NATION RELIGION KING



ELECTRICITE DU CAMBODGE

Ref: 2900 EDC CDD

Phnom Penh, 03 April 2020

Attention: Mr. Andrew Jeffries
Director, Energy Division
Southeast Asia Department
Asian Development Bank

Subject: Confirmation of EDC's commitment on compensation completion and conducting appropriate environmental assessment and mitigation measures for associated facilities

Dear Mr. Andrew Jeffries,

With respect to ADB concern regarding EDC's commitment to complete compensation and environmental assessment for the associated facilities of Grid Reinforcement Project, EDC would like to confirm that land acquisition has been completed and appropriate environmental assessment was conducted at each associated facility (see attachment 1). In addition there was no significant adverse environmental impacts resulted from any phase of project implementation.

Your kind consideration and cooperation is highly appreciated.

Sincerely yours,



KEO ROTTANAK
Minister attached to the Prime Minister
Managing Director of EDC

Cc: - Ms. Daniela Schmidt
- Ms. Rangina Nazrieva

(Attachment 1)
Associated Facilities to the Grid Reinforcement Subprojects Considered for ADB Financing

ID	Subproject Name	Associated Facility
I	Transmission Lines and Substations in Phnom Penh	
TPP1	230kV transmission line from existing GS5 to proposed Sen Sok substation	230kV GS5 substation
TPP2	115kV transmission line from proposed Sen Sok substation to proposed Russei Keo substation	
TPP3	115kV transmission line from proposed Boeung Tompon substation to new Olympic substation	115kV Olympic substation
SPP1	New 230/115kV Dangkor substation	115kV TL from GS4 – GS Toul Pongro and from T – GS10
SPP2	New 230/115/22kV Sen Sok substation	
SPP3	New 115/22kV RUPP substation	115kV UGC from NCC substation – Toul Kork and Boeung Kok substation
SPP4	New 115/22kV Boeung Tompon substation	
SPP5	New 115/22kV Russei Keo substation	
II	Transmission Lines and Substations in Kampong Chhnang (KCN), Kampong Cham (KPC) and Takeo (TKO)	
TKCN1	115kV transmission line from proposed Samiki Meanchey substation to Kampong Tralach	
SKCN1	New 230/115/22 kV Samiki Meanchey substation	230 kV BOT TL from GS6 to GS Kampong Chhnang
SKCN2	New 115/22 kV Kampong Tralach substation	
SKPC1	New 230/22 kV Thnal Keng substation	230 kV BOT TL from GS6 to GS Kampong Cham
SKPC2	New 230/22 kV Skun substation	
STKO1	New 230/115/22 kV Samroang Yoang substation	230 kV TL from Takeo to GS4

Santh 25