1 Environmental and Social Screening Report: Grid Upgrading works Phase 1 and Phase 2 ARISE Project

The Screening Report must include a copy of the technical engineering design for the proposed intervention (where available), at least preliminary concept and description of the proposed project activity.

A. <u>Description of Intervention</u>

Project Identification

Project title	Grid Upgrading Works Phase 1 and Phase 2 ARISE project (Addu City, Fuvahmulah City, Gdh. Thinadhoo, B.Eydhafushi, Lh.Hinnavaru, Kulhudhuhfushi City, L.Isdhoo, L.Kallaidhoo, L.Dhanbidhoo, L.Maabaidhoo, L.Hithadhoo, L. Kunahandhoo, L.Fonadhoo, Sh.Funadhoo)
Project Proponent	Ministry of Environment

Project Location

<table>
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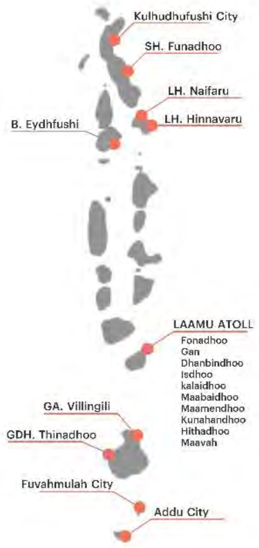
<td>Location</td>
<td>The project is to be undertaken in 14 islands and/or cities all across the country (see figure below). All these islands are where PV installation is to take place. The needed grid upgrading in each island differs based on the status of the grid, and the planned activities by utility (Fenaka for all islands except Sh.Funadhoo. In Sh.Funadhoo the utility is the island council). The scope was finalized based on the input of utility. The map below shows the locations where the ARISE project is to be undertaken[1].

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[1] The map shows all the islands where ARISE project is undertaken. Grid upgrading is undertaken in all islands except, Naifaru, Gan, Maavah, Maamendhoo and Villingili.

Definition of Project Area *(The geographical extent of the project & areas affected during construction)*	In terms of geographic area where project will be undertaken it differs from island to island depending on scope. In some islands, it involves interconnection of the PV to the powerhouse while in others the entire network requires to be upgraded. Annex 2 provides general construction method that will be followed. Cables will be laid along the shoulders of existing roads in all islands and therefore does not require constructing new cable routes. The proposed scope of work for each island is summarized below: 1. Addu City: Involves upgrading and expansion of the existing Medium Voltage (MV) network and laying of Fibre optic communication cable through the same route. Some new transformers in newly constructed Substations will be installed at selected locations and some existing transformers will undergo upgrading. The MV network runs through all the main roads of Addu City including the link roads, hence the project covers all the major roads of Addu (see Figures 1,2,3,4,5 & 6 for detailed route information). 2. Fuvahmulah City: In Fuvahmulah only minor works will be undertaken, it only involves connection of PV to the powerhouse and BESS. Hence geographic impact area is very less (see Figure 7 for detailed route information). 3. Thinadhoo: In Thinadhoo involves upgrading and expansion of the existing MV network and laying of Fibre optic communication cable through the same pathway. Some new transformers will be installed at selected locations and some existing transformers will undergo upgrading. The MV network runs through the major roads of Thinadhoo, hence the project area covers all the major roads of Thinadhoo (see Figure 8 for detailed route information). 4. Eydhafushi: In Eydhafushi involves installation of new MV network and laying of Fibre optic communication cable through the same pathway. Some new transformers in newly constructed Substations will be installed at selected locations and some existing transformers will undergo upgrading. The MV network runs through the major roads of Eydhafushi, hence the project area covers all the major roads of Eydhafushi (see Figure 10 for detailed route information). 5. Hinnavaru: In Hinnavaru involves installation of new MV network and laying of Fibre optic communication cable through the same pathway. Some new transformers in newly constructed Substations will be installed at selected locations and some existing transformers will undergo upgrading. The MV network runs through the major roads of Hinnavaru, hence the project area covers all the major roads of Hinnavaru (see Figure 09 for detailed route information). 6. Kulhudhuhfuhsi City: In Kulhudhuhfushi involves upgrading of the existing MV network and laying of Fibre optic communication cable through the same pathway. Some new transformers in newly constructed Substations will be installed at selected locations and some existing transformers will undergo upgrading. The MV network runs through the major roads of Kulhudhuhfushi hence the project area covers all the major roads of Kulhudhuhfushi (see Figure 11 for detailed route information). 7. Fonadhoo: In Fonadhoo involves expansion of the existing MV network and installation of two new transformers in newly constructed Substations. A fibre optic communication network will be installed connecting the PV installation to the Power house, this was also follow existing MV cable pathways. Works are to be undertaken mostly in a single road in Fonadhoo (See Figure 12 for detailed route information). 8. Isdhooo-Kallaidhoo-Dhanbidhoo: Involves installation of new MV network along with a fibre optic communication network along the same route. Some

	new transformers in newly constructed Substations will be installed in selected locations. Majority of the works will be undertaken in Isdhoo and Kallaidhoo. Will involve works in all the major roads of Isdhoo and Kallaidhoo (see Figures 13,14,15 for detailed route information) In Dhanbidhoo only a single transformer will be installed. 9. Maabaidhoo: Involves expansion for the existing Low Voltage (LV) network. Additionally distribution boxes will be installed and communication fibre network will be established from the PV sites to the Powerhouse (see Figure 18 for detailed route information). 10. Hithadhoo: Involves expansion for the existing Low Voltage (LV) network. Additionally, distribution boxes will be installed and communication fibre network will be established from the PV sites to the Powerhouse (see Figure 17 for detailed route information). 11. Kunahandhoo: Involves expansion for the existing Low Voltage (LV) network. Additionally, distribution boxes will be installed and communication fibre network will be established from the PV sites to the Powerhouse (see Figure 16 for detailed route information). 12. Funadhoo: Involves installation of new MV network along with a fibre optic communication network along the same route. Some new transformers in newly constructed Substations will be installed in selected locations. Works are to be undertaken on the major roads of Funadhoo (see Figure 19 for detailed route information).
Adjacent land and features	Looking at Adjacent land features as works will be undertaken in existing roads adjacent features different types of land use: • Residential developments • Commercial developments like shops etc. • Public places including parks, mosques, habours, government buildings, sports grounds and schools • Industrial areas like workshops etc. (see Figure 1 to 19 for detailed breakdown of adjacent features for each island)

. Project Justification

Need for the project (*What problem is the project going to solve*)	The existing grids where PV and BESS are to be installed at present does not have the capacity to integrate solar PV and BESS. Hence grid upgradation is undertaken in order to ensure PV and BESS integration to existing systems without interruptions.
Purpose of the project (*what is going to be achieved by carrying out the project*)	As per the Strategic Action Plan (SAP) 2019 to 2023 (https://presidency.gov.mv/SAP/) of the government it is a target (Target 2.1) of the government to achieve 20 percent increase of renewable energy in National Energy mix by 2023 when compared to 2018 levels. To attain this target ministry aims to achieve 70% of peak load of electricity from renewable energy sources from all inhabited islands. This project facilitates to achieve this objective as for PV installation can only be undertaken with the needed grid upgrading.
Alternatives considered (*different ways to meet the project need and achieve the project purpose*)	In terms of alternatives considered as the project involves upgrading of existing infrastructure not much alternatives can be considered. However, for communication network instead of fibre network 4G mobile network was

	considered. However due to reliability issues of 4G network in Maldives fibre network was opted for this purpose.

. Project Description

Proposed start date	March 2022
Proposed completion date	June 2023
Estimated total cost	USD 25 million
Present land ownership	The roads of the islands where work will be undertaken is owned by the respective councils. The transformer locations fall under the purview of Fenaka. Councils allocate the land and handover to Fenaka.
Description of the project (*with supporting material such as maps, drawings etc attached as required*)	The primary scope will include strengthening network capacity; deploying supervisory control and data acquisition (SCADA) systems; and optimizing interactions among renewable energy generation, BESS, and existing conventional power plants. In particular, this will include upgrades in low and medium voltage cables, transformers, and distribution boxes, to facilitate optimization between solar PV, distributed generation, and BESS (Annex 2 provides general construction method statement for cable laying and construction of substation).
Project Management Team	The project management team from the Ministry of Environment side includes the following members: Maumoon Khalid: Project Manager Thaalooth Rasheedh: Financial Management Specialist Mohamed Hamdhaan Zuhair: Environmental and Social Safeguards Specialist Abdulla Afsal: Procurement Management Specialist Ifaad Waheed: Communications Specialist Akram Waheed: Senior Energy Specialist Nuzhath Ahmed: Project Coordinator Aminath Hanaan Mohamed: Monitoring and Evaluation Specialist

B. Site Description Questionnaire

1. Site Setting and Land use/Ownership

a) Who is the owner/occupier of the site (refer to land registry/title deed)?

Fenaka Corporation Limited is owner of the lands for the locations where Substations are to be constructed where all the new transformers will be installed. Other than this only visible infrastructure in public lands will be road side distribution boxes. All installations will be undertaken as per the standard guidance of Utility Regulatory Authority.

b) What is the current land use of the site?

Project involves some upgrading of transformers by replacing existing transformers and construction of substations in virgin land in some of the islands. In terms of cable laying works will be undertaken on existing roads, no new roads are to be constructed for the purpose of the project.

The islands where new transformers are to be installed are summarized below:

1. Addu City: One new Substation will be constructed in Hithadhoo and two new in Meedhoo. Some vegetation clearance will be required for both these sites. These are also 20 feet by 20 feet areas. At present these are virgin land.
2. Thinadhoo: Five new Substations will be constructed in Thinadhoo. All the new substations are to be constructed in newly reclaimed land of Thinadhoo. No vegetation is to be removed for the purpose as it is barren land at present.
3. Eydhafushi: In Eydhafushi 05 new substations are to be constructed. All these at present are virgin land. Other clearance of shrubs major vegetation clearance not required.
4. Hinnavaru: In Hinnavaru 05 new substations are to be constructed. All these at present are in virgin land. Other clearance of shrubs major vegetation clearance not required.
5. Kulhudhuhfushi: Two new substations are to be installed. Some land clearance activities may have to be undertaken in these locations.
6. Fonadhoo: Two new substations are to be constructed through the project. These are all virgin land at present some minor vegetation clearance may be required.
7. Isdhoo: In Isdhoo 02 new substations are to be constructed. All these at present are in virgin land. Some vegetation are required to be removed for the purpose of this in Isdhoo.
8. Kallaidhoo:In Kallaidhoo 02 new substations are to be constructed. All these at present are in virgin land, Some vegetation are required to be removed for the purpose of this construction.
9. Dhanbidhoo: One new substation to be constructed in existing powerhouse land. No vegetation is to be removed for this purpose.
10. Maabaidhoo, Kunahandhoo & Hithadhoo: In these islands as it is a Low Voltage network no substations will be constructed, hence other than underground cable laying and above ground distribution boxes on the roads no other major works will be undertaken. Hence in terms of landuse no impacts are anticipated.

c) When the site was first developed to the current land use?

The substations will be constructed in virgin land hence no previous land use. As for cable laying and distribution boxes existing roads will be utilized.

d) What is the historical land use of the site prior to the current development of the site?

Virgin land

e) What is the current land use of the properties surrounding the vicinity of the site and adjacent to the site? (Request for land use plan with planned developments at the island/note land use during site vicinity walk around);

Considering the path (roads) of cable laying and new transformers significant adjacent infrastructure are described below:

(a) Addu City (Gan): Airport, MNDF Southern Area Command, Equator Village (Figure 1).

FIGURE 1 LANDMARKS NEAR GRID UPGRADING PATHWAY (ADDU CITY GAN)

(b) Addu City (Feydhoo): Feydhoo School, Feydhoo Friday Mosque, Residential/Commercial developments, Addu Link Road (Figure 2).

FIGURE 2 LANDMARKS NEAR GRID UPGRADING PATHWAY (ADDU CITY FEYDHOO)

(c) Addu City (Maradhoo-Feydhoo & Maradhoo): Mosque (Masjid Al-Thaqwa), Mosque (Masjid Noor), Mosque (Masjid Al-Iklas), Maradhoo Football Stadium, Maradhoo School, Maradhoo-Feydhoo School, Addu Link Road, Maradhoo Habour, Maradhoo-Feydhoo Habour, Residential/Commercial developments (Figure 3).

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FIGURE 3 LANDMARKS NEAR GRID UPGRADING PATHWAY MARADHOO-FEYDHOO & MARADHOO

(d) Addu City (Hithadhoo): Police Academy, WAMCO Landfill site, Addu Port, Addu Football Stadium, Maa Kilhi PA, Addu City Square, Sharafudheen School, Masjid Noor (Mosque), Hithadhoo Football Stadium, Addu High School, Residential/Commercial developments. New transformer in Hithadhoo is in an industrial zone dedicated to factories (Coca Cola Company) etc. Other than this upgrading works in 4 substations will be undertaken where the existing transformer within the substation will be replaced (Figure 4 & 5).

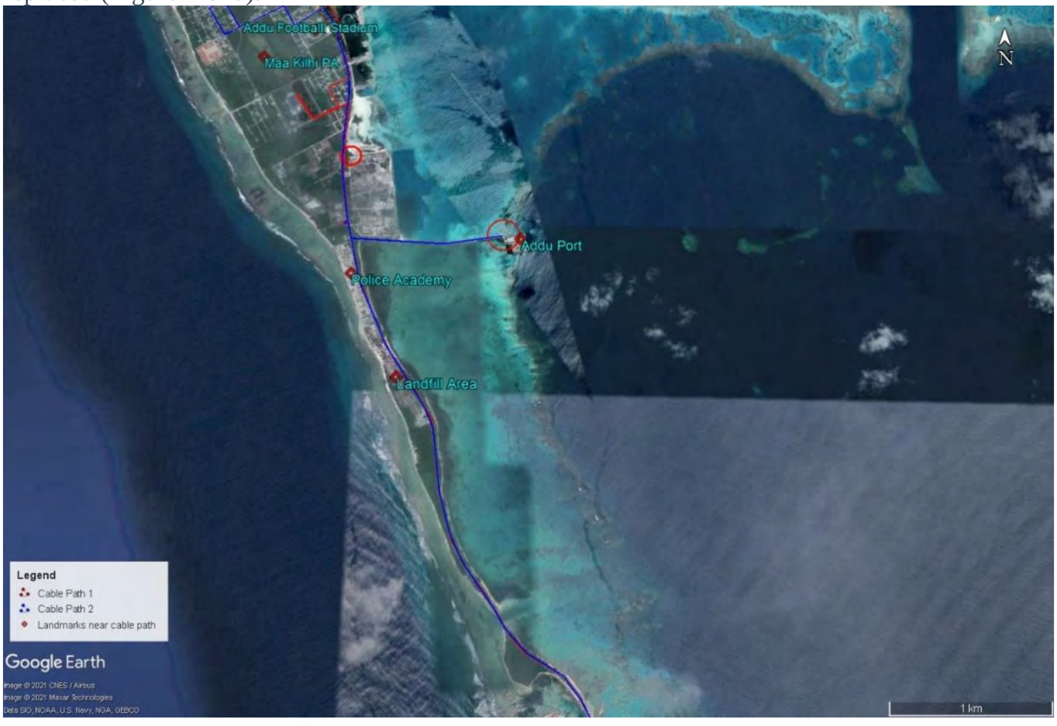


FIGURE 4 LANDMARKS NEAR GRID UPGRADING PATHWAY HITHADHOO ZONE 1

FIGURE 5 LANDMARKS NEAR GRID UPGRADING PATHWAY HITHADHOO ZONE 2

(e) Addu City (Hulhudhoo-Meedhoo): Mifco Fish Factory (one new substation is located within the factory premise), Island Waste Management Centre (IWMC), RO plant, Sewerage Treatment Plant, Masjid Al Wahuda (Mosque), Thakiyaa Miskie (Mosque), Seenu Atoll School, Shareefee Pre-school, Shamsudeen School, agricultural land, Central Habour, Mathikilhi PA, Residential/Commercial developments (Figure 6). Two new substations are to be constructed, one near Mathikilhi and another within the premise of MIFCO fish factory. Other than this upgrading works in 4 substations will be undertaken where the existing transformer within the substation will be replaced (Figure 6)

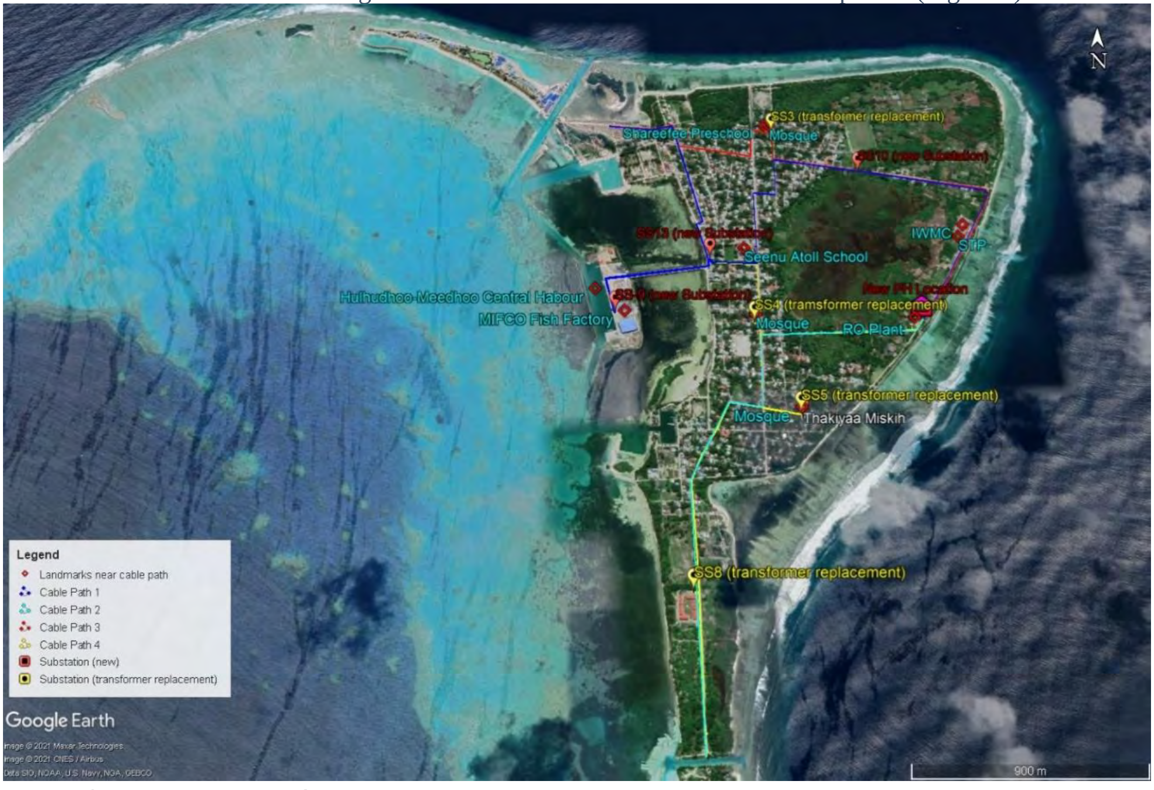


FIGURE 6 LANDMARKS NEAR GRID UPGRADING PATHWAY HULHUDHOO-MEEDHOO

(f) Fuvahmulah: Airport.

FIGURE 7 LANDMARKS NEAR GRID UPGRADING PATHWAY FUVAHMULAH

(g) Thinadhoo: Aboobakuru School, Gdh. Zone Stadium, Thinadhoo Football Ground, Mosque (Masjid Ikhlas). All new substations in barren land in reclaimed land. Other than this upgrading works in 5 substations will be undertaken where the existing transformer within the substation will be replaced (Figure 08).

FIGURE 8 LANDMARKS NEAR GRID UPGRADING PATHWAY THINADHOO

(h) Hinnavaru: Lh. Atoll Education Centre, Masjid Ansar (Mosque), RO plant, Habour, Residential/Commercial developments. One new substation located near the habour, the remaining four substations located around the island in different empty plots (Figure 09).

FIGURE 9 LANDMARKS NEAR GRID UPGRADING PATHWAY HINNAVARU

(i) Eydhafushi: Masjid Al Yoosuf (Mosque), Eydhafushi Turf Football ground, Eydhafushi football ground, Habour Residential/Commercial developments. One new substation located near the habour, the remaining four substations located around the island in different empty plots (Figure 10).

FIGURE 10 LANDMARKS NEAR GRID UPGRADING PATHWAY EYDHAFUSHI

(j) Kulhudhuhfushi: Friday Mosque, Masjid Al Hasanaath (Mosque), Zone Stadium, Kuda Kulhi (Maafalu fengandu), Afeefuhdeen School, Kuda Miskie (Mosque), Masjid Al Ula (Mosque), Maldives National University Compound, HDh. Atoll Education Centre (Figure 11).

FIGURE 11 LANDMARK NEAR GRID UPGRADING PATHWAY KULHUDHUHFUSHI

(k) L.Fonadhoo: Barasil Mosque, Siraajudheen Mosque, Laamu Atoll Education Centre, ARFA Preschool, Kurigan Womens Mosque, Kurigan Football Ground, Barasil Football Ground, Residential and Commercial Developments. The two new substations in Fonadhoo are to be located in empty plots (Figure 12).

FIGURE 12 LANDMARKS NEAR GRID UPGRADING PATHWAY L.FONADHOO

(l) L.Isdhoo: Isdhoo School, Isdhoo Football Stadium, Isdhoo Mosque, Agricultural land, Residential and Commercial Developments. 03 new Substations located in empty plots (Figure 13).

FIGURE 13 LANDMARKS NEAR GRID UPGRADING PATHWAY L.ISDHOO

(m) Kallaidhoo: Kallaidhoo Sports Arena, Kallaidhoo School, Agricultural Land, habour Commercial and Residential Developments. 02 new Substations located in empty plots (Figure 14).

FIGURE 14 LANDMARKS NEAR GRID UPGRADING PATHWAY L.KALLAIDHOO

(n) Dhanbidhoo: Substation located inside the Powerhouse (Figure 15).

FIGURE 15 SUBSTATION LOCATION FOR DHANBIDHOO TO BE INSTALLED UNDER GRID UPGRADING COMPONENT OF THE PROJECT

(o) Kunahandhoo: Friday Mosque, Kunahandhoo Football ground, Kunahandhoo Mosque, Kunahandhoo School, Habour, Commercial/Residential Developments.

FIGURE 16 LANDMARKS NEAR GRID UPGRADING PATHWAY KUNAHANDHOO

(p) Hithadhoo: Masjid Al Izzu (Mosque), Masjid Noor (Mosque), Hithadhoo School, Habour, Island Waste Management Centre, Commercial and Residential Developments.

FIGURE 17 LANDMARS NEAR GRID UPGRADING PATHWAY L.HITHADHOO

(q) Maabaidhoo: Habour, Laamu Atoll School, Football Ground, Preschool, Mosque, Mabaidhoo Kulhi (Wetland) and commercial & residential developments (Figure 20).

FIGURE 18 LANDMARKS NEAR GRID UPGRADING PATHWAY MAABAIDHOO

(r) Funadhoo: Funadhoo School, Funadhoo Hospital, Wetland Area of Funadhoo, Mosque, Habour and Commercial & residential developments. Proposed two transformers are on empty plots surrounding are mostly residential developments (Figure 19).

FIGURE 19 FUNADHOO LANDMARKS NEAR GRID UPGRADING PATHWAY

2. Consultations with island council/local communities and civil society organization

Several steps have been followed when undertaking consultations with the island communities and civil society for the purpose of the project. These include the following:

11. Online survey opened to the whole island community: These surveys were publicized through the social media pages and groups of the councils and the ministry. For none of the islands any concerns were raised regarding the Grid Upgrading Component. And for all the islands surveyed more than 90% of the survey respondents were happy with the project. These surveys were undertaken during from July 2020 onwards. (detailed survey reports shared with WB for phase 1 with PV screening forms islands, phase 2 islands reports will be shared along with PV screening forms for phase 2 islands).
12. Consultative sessions with the civil society: Consultation with civil society of each island was undertaken during the last week of December 2020 for phase 01 islands (Addu City, Fuvahmulah City, Thinadhoo, Eydhafushi, Hinnavaru and Kulhudhuhfushi City). For the remaining islands these consultations are planned for January 2022. In these consultations, presentations were given from the PMU to the participants. Details of the project interventions planned for each island, results of the social survey and gender interventions planned under the project were shared with the participants. No particular concerns or issues regarding Grid Upgrading was raised by the participants of the consultation. (note: these consultation minutes were shared previously with the World Bank).

Additional information required from island council:

1) ***Current and projected population;***

Name of the Island	Male population	Female population	Total
1. Hinnavaru	1337	1345	2683
2. Addhu City			
2.1 Hithadhoo	7,564	5,521	13,085

2.2 Feydhoo	1,683	1,169	2,852
2.3 Meedhoo	2,171	1,238	3,409
2.4 Hulhudhoo	898	608	1,505
2.5 Maradhoo	1,248	933	2,836
2.6 Maradhoo-Feydhoo	760	622	1,382
3. Fuvahmulah City	5,199	4,674	9,873
4. Eydhafushi	1,548	1,346	2,894
5. Thinadhoo	3,821	2,401	6,222
6. Kulhudhuhfushi City	4,711	4,849	9,560
7. Laamu Atoll			
7.1 Isdhoo	615	493	1,108
7.2 Dhanbidhoo	395	336	731
7.3 Maabaidhoo	432	332	764
7.4 Fonadhoo	1,701	1,238	2,939
7.6 Hithadhoo	570	529	1,099
7.7 Kunahandhoo	390	338	728
7.8 Kallaidhoo	363	299	662
8. Funadhoo	1,195	1,214	2,409

2) ***Number of households (and Empty houses);***

Name of the Island	**No. Households**	**No. empty houses/plots**
9. Hinnavaru	875	32
10. Addhu City		
2.1 Hithadhoo	1980	Not available
2.2 Feydhoo	675	Not Available
2.3 Meedhoo	397	Not Available
2.4 Hulhudhoo	306	Not Available
2.5 Maradhoo	444	Not Available
2.6 Maradhoo-Feydhoo	242	Not Available
11. Fuvahmulah City	2613	703
12. Eydhafushi	554	94
13. Thinadhoo	1343	467

14. Kulhudhuhfushi City	1385	Not available
15. Laamu Atoll		
7.1 Isdhoo	177	Not available
7.2 Dhanbidhoo	135	Not available
7.3 Maabaidhoo	137	Not available
7.4 Fonadhoo	394	Not available
7.6 Hithadhoo	196	Not available
7.7 Kunahandhoo	114	Not available
7.8 Kallaidhoo	137	Not available
16. Funadhoo	401	Not available

3) ***Planned development activities;***

The government of Maldives maintains a website providing information on planned development activities in each island the link for the project islands are provided below.

(a) Addu City: Feydhoo (Isles - Feydhoo), Hithadhoo (Isles - Hithadhoo), Hulhudhoo (Isles - Hulhudhoo), Maradhoo (Isles - Maradhoo), MaradhooFeydhoo (Isles - Maradhoofeydhoo), Meedhoo (Isles - Meedhoo).
(b) Fuvahmulah: Isles - Fuvahmulah
(c) Thinadhoo: Isles - Thinadhoo
(d) Hinnavaru: Isles - Hinnavaru
(e) Naifaru: Isles - Naifaru
(f) Eydhafushi: Isles - Eydhafushi
(g) Funadhoo: Isles - Funadhoo
(h) L.Fonadhoo: Isles - Fonadhoo
(i) L.Gan: Isles - Gan
(j) L. Isdhoo: Isles - Isdhoo
(k) L.Kallaidhoo: Isles - Kalaidhoo
(l) L.Dhanbidhoo: Isles - Dhan'bidhoo
(m) L.Maabaidhoo: Isles - Maabaidhoo
(n) L.Hithadhoo: Isles - Hithadhoo
(o) L.Kunahandhoo: Isles - Kunahandhoo

4) ***Present employment by industry;*** *Information on employment based on industry is available at the atoll level the data at the atoll level, as per household income and expenditure survey are presented below:*

As per Household Income and Expenditure Survey (HIES) survey of 2016 the following are the key industries in the atolls where project is to be undertaken (note: island level data is not available from National Bureau of Statistics)

Atoll	**Agriculture (%)**	**Other Industry (%)**	**Service (%)**
Lhaviyani Atoll	18	22	59
Baa Atoll	10	28	67
Addu City	5	20	74
Fuvahmulah City	9	21	68
Haa Dhaal Atoll	10	28	61

Gaafu Dhaal Atoll	18	17	62
Laamu Atoll	22	19	55
Shaviyani Atoll	15	36	47

5) *Income distribution;*

Income distribution information is also available at an atoll level. The information for income distribution and labour force participation based on household income and expenditure survey of 2016 are presented below:

Atoll	Labor force participation rate (%)	Average hourly income of women (MVR)	Average hourly income of men (MVR)
Lhaviyani Atoll	51.5	58.32	52.7
Baa Atoll	52.5	68.43	56.95
Addu City	46.1	54.09	60.78
Fuvahmulah City	48.7	57.17	55.99
Haa Dhaal Atoll	56.1	74.89	99.26
Gaafu Dhaal Atoll	48.7	44.27	57.92
Laamu Atoll	56.5	64.25	74.73
Shaviyani Atoll	61.2	58.45	56.06

6) *Public health status.*

In terms of public health, except for some smaller islands selected from laamu atoll, all other islands selected for the project are major population centres in each of these atolls. Hence, they have relatively good public health facilities. In this regard, hospitals are found in Addu City, Fuvahmulah City, Kulhudhuhfushi City, Eydhafushi, Thinadhoo, Funadhoo and L.Gan. Hinnavaru has a health centre, which is in the process of being upgraded to a 30 bed hospital. Moreover, there are plans to build a first of its kind super specialist Cancer hospital in Laamu Atoll Gan. As for rest of the islands in Laamu atoll there are health centres in these islands.

C. Screening for Potential Environmental Impacts in relation to the proposed project intervention

	Screening question	Yes	No	Significance of the effect (Low, moderate, high)	Remarks
Section A: General					
1	Will construction and operation of the Project involve actions which will cause physical changes in the locality (topography, land use, changes in water bodies, etc)	**Yes**		**Moderate**	Permanent physical changes are very minor as these will only occur in islands where transformer substation hut is to be constructed and other than this the only visible structure will be distribution boxes. Other than this will involve burying of cables if levelled properly and the roads resurfaced to previous levels this will not be an issue permanently.
2	Will the Project involve use, storage, transport, handling or production of substances or materials which could be harmful to human health or the environment or raise concerns about actual or perceived risks to human health?	**Yes**		**Moderate**	For some islands (Addu, Thinadhoo, Kulhudhuhfushi, Fuvahmulah) For road crossings cutting of asphalt roads and resurfacing of the roads following burying of cables are needed. Asphalt is made by combining Bitumen and Aggregates. Bitumen needs to be stored in appropriately sealed barrels on a hard surface any leakages may lead to ground water pollution.
3	Will the Project produce solid wastes during construction or operation?	**Yes**		**Low**	Considering scope of works, this project is unlikely to generate any significant solid or hazardous waste. The existing transformers that are to be replaced according to Fenaka will be reused in another island.
4	Will the Project release pollutants or any hazardous, toxic or noxious substances to air?	**Yes**		**Low**	Other than dust from concrete mixing needed to construct the transformer huts in selected islands no major air emissions are anticipated. Other than this emission will be from the vehicles that will be used both during construction and operation phase of the project.
5	Will the Project cause noise and vibration or release of light, heat energy or electromagnetic radiation?	**Yes**		**Low**	During construction phase some noise can occur, however considering the scope of works significant prolonged noise is not anticipated. Majority of the noise will be from concrete mixing during construction phase this will also be only

					in some islands where transformer substation huts are to be constructed.
6	Will the Project lead to risks of contamination of land or water from releases of pollutants onto the ground or into surface waters, groundwater or coastal waters?	**Yes**		**Low**	Check point 2.
7	Will the project cause localized flooding and poor drainage during construction? Is the project area located in a flooding location?	**Yes**		**Moderate**	Localized flooding can occur if the area is not levelled properly, especially since digging and cable laying will be undertaken covering all over the island. There have been cases where contractors have not appropriately back-filled trenches causing local flooding issues in some projects. In addition, there is risk of surge related flooding risk to infrastructure that is going to be established through the project including the transformer substations. The risk will be there if the substation huts are not appropriately raised.
8	Will there be any risks and vulnerabilities to public safety due to physical hazards during construction or operation of the Project?	**Yes**		**Moderate**	Public safety issues can occur during construction phase as majority of the activities will be undertaken in public roads. If appropriate signage is not places and if not properly coordinated with the councils it can lead to risks like falling to pits and accidents.
9	Are there any transport routes on or around the location which are susceptible to congestion or which cause environmental problems, which could be affected by the project?	**Yes**		**Moderate**	As majority of the works will be undertaken on the roads of these islands coordination with the council and police are required to prevent congestion on roads and to ensure smooth traffic diversion where required. As majority of the works will be undertaken on the sides of the roads, full road closure is not anticipated.
10	Are there any routes or facilities on or around the location which are used by the public for access to recreation or other facilities, which could be affected by the project?	**Yes**		**Moderate**	As highlighted in the landmark charts in almost all the islands there are public spaces in and around the cable laying routes. Hence impacts are anticipated during construction phase. This includes Mosques, Schools and football grounds. Note that all these have alternative

					access routes, hence with proper coordination the disruption period can be minimized.
11	Are there any areas or features of high landscape or scenic value on or around the location which could be affected by the project?	**Yes**		**Low**	Very few such areas have been identified based on the routes where cables are laid. This includes the following: Sh.Fonadhoo Wetland Area L.Maabaidhoo Wetland Area HDh. Kulhudhufushi Wetland Area Addu City: Maakilhi Protected Area in Hithadhoo and MathiKilhi Protected Area in HulhudhooMeedhoo These works are undertaken on existing roads next to these areas and will not encroach into the boundary of the area. Plus no main entrances to these areas will be blocked as part of the planned activities.
12	Are there any other areas on or around the location which are important or sensitive for reasons of their ecology e.g. wetlands, watercourses or other water bodies, mountains, forests which could be affected by the project?	**Yes**		**Low**	See question 11.
13	Is the location within or adjacent to the coastal zone? If so, what is the distance to the coast?		**No**	**N/A**	All activities are undertaken within existing roads and are outside the 20 meter environment protection zone designated in landuse plan. .
14	Are there any areas on or around the location which are used by protected, important or sensitive species of fauna or flora e.g. for breeding, nesting, foraging, resting, migration, which could be affected by the project?	**Yes**		**Low**	See question 11

15	Are there mangrove, coral reef, sea grass bed, turtle beach habitats etc within close proximity?	**Yes**		**Low**	See question 11.
16	Is the project located in a previously undeveloped area where there will be loss of green-field land	**Yes**		**Low**	No vegetation will be removed for the purpose of cable laying as existing roads will be used for this purpose. However, some of the locations where the 20 feet by 20 feet substations are to be located have some vegetation and shrubs. This require some minor clearances. However, the quantity of vegetation that is required to be removed for this purpose is minimal. The islands where this clearance is expected include Hulhudhoo-Meedhoo Addu City, Hithadhoo, Kulhudhuhfushi, Isdhoo, Kallaidhoo, Eydhafushi and Hinnavaru.
17	Will the project cause the removal of trees in the locality?	**Yes**		**Low**	See question 16.
18	Can any of the identified historic or culturally importance sites on or around the location be affected by the project?		**No**	**N/A**	Considering the locations no such areas have been identified during the screening process.
19	Are there existing land uses on or around the location e.g. homes, gardens, other private property, industry, commerce, recreation, public open space, community facilities, agriculture, forestry, tourism, mining or quarrying which could be affected by the project?	**Yes**		**Moderate**	As identified previously the cable lines run through the major roads in all islands except Dhanbidhoo and Fuvahmulah where the scope of work is very small. Thus, will run through residential and commercial areas in all the islands hence temporary inconveniences can occur during construction phase.
20	Are there any areas on or around the location which are densely populated or built-up, which could be affected by the project?	**Yes**		**Moderate**	See above
21	Are there any areas on or around the location which are occupied by sensitive land	**Yes**		**Moderate**	The cable laying pathway in most islands go close to mosques and schools.

	uses e.g. hospitals, schools, places of worship, community facilities, which could be affected by the project				Hence temporary disturbance is anticipated.
22	Are there any Defence Installations / Airport Routes	**Yes**		**Low**	As can be seen from landmark maps provided for each island, cable laying works will be undertaken close to airports in three of the islands i.e. Gan International Airport, Fuvahmulah Airport and Kulhudhuhfushi Airport.
23	Are there any areas on or around the location which contain important, high quality or scarce resources e.g. groundwater, surface waters, forestry, agriculture, fisheries, tourism, minerals, which could be affected by the project?	**Yes**		**Low**	If the cable laying trenches require dewatering it can temporarily impact ground water.
24	Are there any areas on or around the location which are already subject to pollution or environmental damage e.g. where existing legal environmental standards are exceeded, which could be affected by the project?		**No**	**N/A**	No such locations have been identified at present.
25	Will the project involve treatment of Solid Waste, if so indicate the amounts, nature of waste and briefly describe proposed waste management technologies to be implemented on site.		**No**	**N/A**	Does not involve treatment of Solid waste, construction waste will be required to be transferred to the regional waste management facility at Thilafushi, any domestic general waste generated by the construction work force will be managed through the island waste stream to be managed at the Island Waste Management Center (IWMC) and their on forth the Regional Waste Management Facility closest to the island.
Section B: Specific Screening Questions on Floating Solar					
3	Water body identified for floating solar is lagoon, coastal water way, harbor/jetty area or other, please provide details in the comments of the site			**N/A**	
4	Is the identified water body is used for water supply?			**N/A**	

5	Is the identified water body used for fishing activities?			**N/A**	
6	Is the identified water body used for any other human activity, such as recreation, docking of boats etc?			**N/A**	
7	Will the project activity restrict access to the water body or lead to safety concerns?			**N/A**	
8	Will the establishment of the Solar PV lead to aesthetic issues on site.			**N/A**	
Section C: Social Impact Screening					
1	Will the project create significant/ limited/ no social impacts? If so please provide details of what they will be.	**Yes**		**High (positive)**	The project will lead to significant positive impacts as this component of the project involves upgrading of the grid such that renewable energy can be penetrated to existing grid. The upgrading works undertaken through project will improve the quality of the existing grid and hence black outs and other such issues that currently occur in these islands are likely to be reduced as a result of this project implementation thus leading to a direct positive benefit to the community.
2	Land acquisition resulting in loss of income from agricultural land, plantation or other existing land-use.		**No**	**N/A**	No major land acquisition is required. Works will be undertaken in land allocated to Fenaka by the council and land survey authority for the purpose of the project.
3	Land acquisition resulting in relocation of households.		**No**	**N/A**	see above
4	Cause any reduction of access to traditional and river dependent communities (to river and areas where they earn for their primary or substantial livelihood).		**No**	**N/A**	No access restrictions are anticipated as a result of this project.
5	Cause any displacement or adverse impact on tribal settlement(s).		**No**	**N/A**	No such impacts are anticipated.
6	Lead to any specific gender issues.	**Yes**		**High (positive)**	Project as a whole will impact positively from a Gender perspective as Gender specific trainings are planned through the project and it is targeted to 100 percent increase in number of women employed in technical positions of utilities in Malidves through the Gender

					Action Plan (GAP) developed for the project.
7	Will the project create significant / limited / no Social impacts during the construction stage?	**Yes**		**Moderate**	Moderate impacts are anticipated as existing roads of the islands will be utilized during construction.
Section D: Impacts of Construction					
1	Will the project lead to flooding of adjacent areas	**Yes**		**Low**	If properly levelled this will not happen. However the risk is there if the contractor does not appropriately level the roads following cable laying.
2	Will it involve the improper storage and handling of substances leading to contamination of soil and water	**Yes**		**Low**	Further details have been provided in section A question 2.
3	Will the activity lead to elevated noise and dust emission?	**Yes**		**Low**	Only noise that will be generated during construction phase will be from concrete mixers during construction of substation transformers in selected islands.
4	Will project activities lead to disruption to traffic movements	**Yes**		**Moderate**	As majority of the works will be undertaken on the roads of these islands coordination with the council and police are required to prevent congestion on roads and to ensure smooth traffic diversion where required. As majority of the works will be undertaken on the sides of the roads, full road closure is not anticipated unless in situations where a road crossing is involved.
5	Will project activities lead to damage to existing infrastructure, public utilities, amenities etc.	**Yes**		**Moderate**	As the project involves digging trenches in roads, there is chance of damage to existing utility lines.
6	Possible conflicts with and/or disruption to local community	**Yes**		**Low**	No particular issues can be identified for construction phase. However the following general aspects, applicable to

					all construction activities apply here as well: - Conflicts may occur if any human health impacts occur to the public due to negligence of construction work force. - Moreover, especially if foreign work force is involved conflicts may occur with local community. - The Labour Management Procedures developed for the project needs to be followed to address these issues (link: https://www.environment.gov.mv/v2/en/download/10026).
7	Are there adequate facilities for storage of construction goods & materials	**Yes**		**Low**	Not much Storage will be needed for this project considering scope. All the islands where project is to be undertaken have space where temporary storage facilities could be established.
8	Will need to establish facilities for storage of any hazardous material		**No**	**N/A**	Hazardous waste is not expected to be generated as mentioned previously the transformers that are going to be replaced will be reused by Fenaka in other parts of the country.
9	Facilities for long term housing for operational workers		**No**	**N/A**	Long term housing will not be needed. Only short term stay needed considering scope of works, for which rented accommodation could be used.
10	Will the construction works (Permanent &Temporary) lead to alterations of the site	**Yes**		**Moderate**	Especially during construction period as trenches will be dug in roads some disruptions could be anticipated.
11	Are facilities for construction workers (temporary labour camp, drinking water, waste disposal, etc.) required during implementation	**Yes**		**Low**	These will be required and will be the responsibility of the contractor. However, usually contractors rent out existing accommodation to house contractor staff, these households will be connected to island water and sewer infrastructure. Domestic waste generated by construction workforce will be managed through island waste management stream.
12	Are facilities for disposal of solid waste available on the Island- please specify the forms in the comments	**Yes**		**Low**	Each of these islands have Island Waste Management Centers (IWMCs) all domestic waste produced by any staff of the contractor during construction phase will go there and from there onwards to

					regional facility. All construction waste generated needs to be taken to Thilafushi island by contractor.
Section E: Cumulative Impacts					
1	Cumulative effects due to proximity to other existing or planned projects with similar impacts	**Yes**		**Moderate**	Some activities are expected to be undertaken in parallel. In this regard, BESS installation through the project and PV installation through the project are likely to be undertaken within the same time frame.

8. Project operating requirements

		Yes	No
24	Does the project belong to a prescribed category of the Environmental Protection Authority for EIA		No. EPA screening undertaken for all the islands. EPA have given approval for all the islands. For some islands where vegetation clearance is required EPA has included some mitigation measures to follow, these are covered in the ESCP prepared for the project as well.
25	Does the project need to obtain clearances from agencies such as the EPA, Island Council, Atoll Council etc :	For land of new substation council approval needed for Fenaka.	

9. Conclusion and Screening Decision

Summary of environmental effects:

Assuming that all mitigation measures are implemented as proposed, the following effects can be predicted

	N/S - Effect not significant, or can be rendered insignificant with mitigation
✓	SP - Significant positive effect
	SN - Significant negative effect
	U - Outcome unknown or cannot be predicted, even with mitigation

10. Screening Decision Recommendation (check one):

✓	All potentially adverse effects can be classified as general construction related impacts and are mitigatable with known technology and operational impacts are minimal. Public concern does not warrant further assessment. As most of the impacts are related to safety aspects and these can be ensured through various of safety code and since the Maldives EPA screening suggested that no further assessments needed. An Environmental and Social Codes of Conduct needs to be developed and the project undertaken as per the code.
	All potentially adverse effects can be classified as general construction related impacts and are mitigatable with known technology and operational impacts are minimal. Public concern does not warrant further assessment. Therefore, standalone Environmental and Social Assessment not required, an Environmental and Social Management Plan would be required prior to the project proceeding.
	Potential adverse impacts are significant, hence, a standalone Environmental and Social Impact Assessment, including an Environmental and Social Management Plan is needed before the project can proceed
	Potential adverse impacts are significant, hence project cannot be justified

11. Details of Persons Responsible for the Environmental Screening

Screening report completed by:

Name and Designation: Mohamed Hamdhaan Zuhair (Environmental and Social Safeguards Specialist, Ministry of Environment)

Date: 16th November 2021

Signature: (Signature will be added once review completed)

Screening report reviewed by:

Name and Designation: Maumoon Khalid, Project Manager

Date: 16th November 2021

Signature: (Signature will be added once review completed)

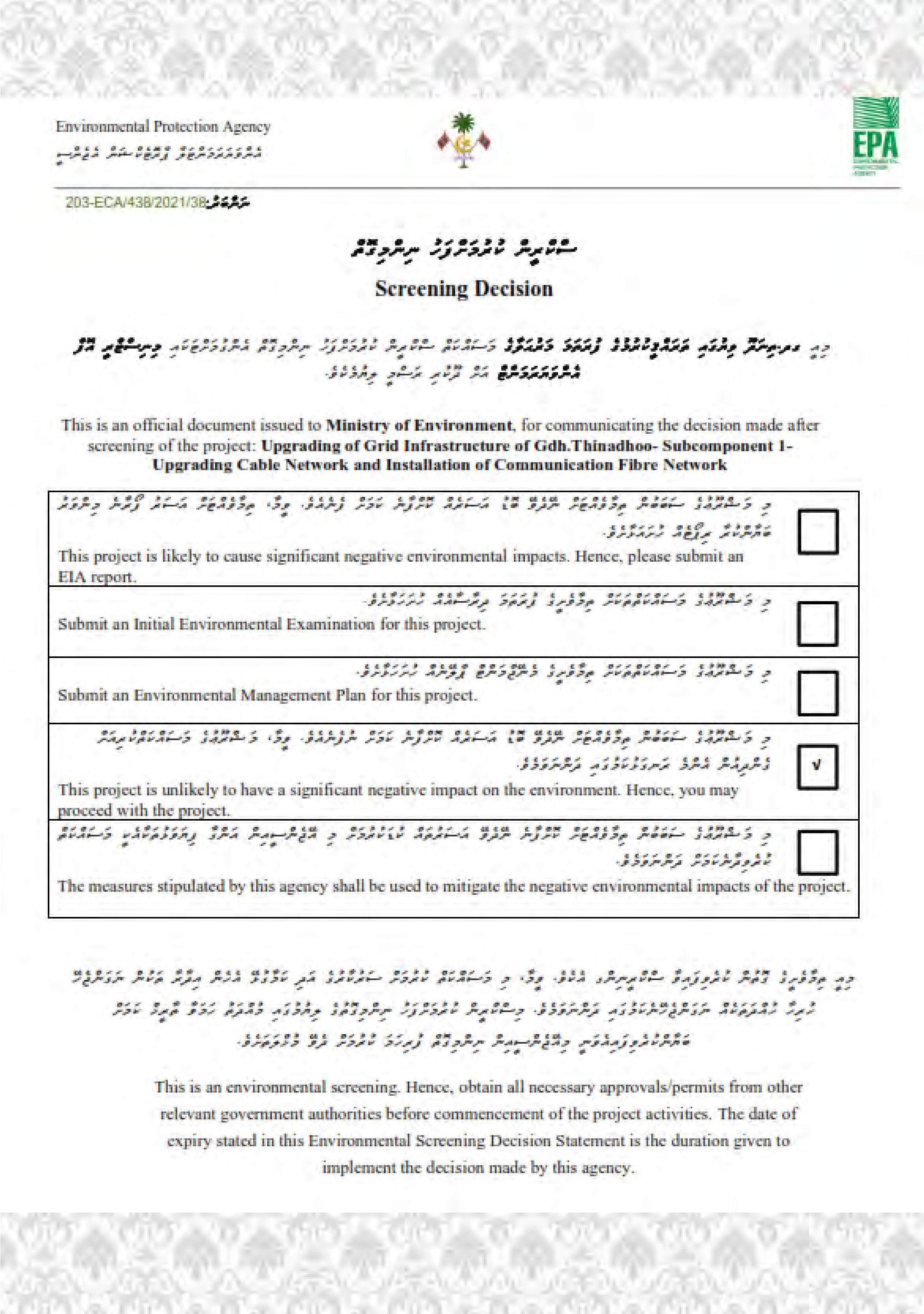
Approved by:

Name and Designation:

Date:

Signature:

Annex 1: EPA Screening Decisions



Environmental Protection Agency

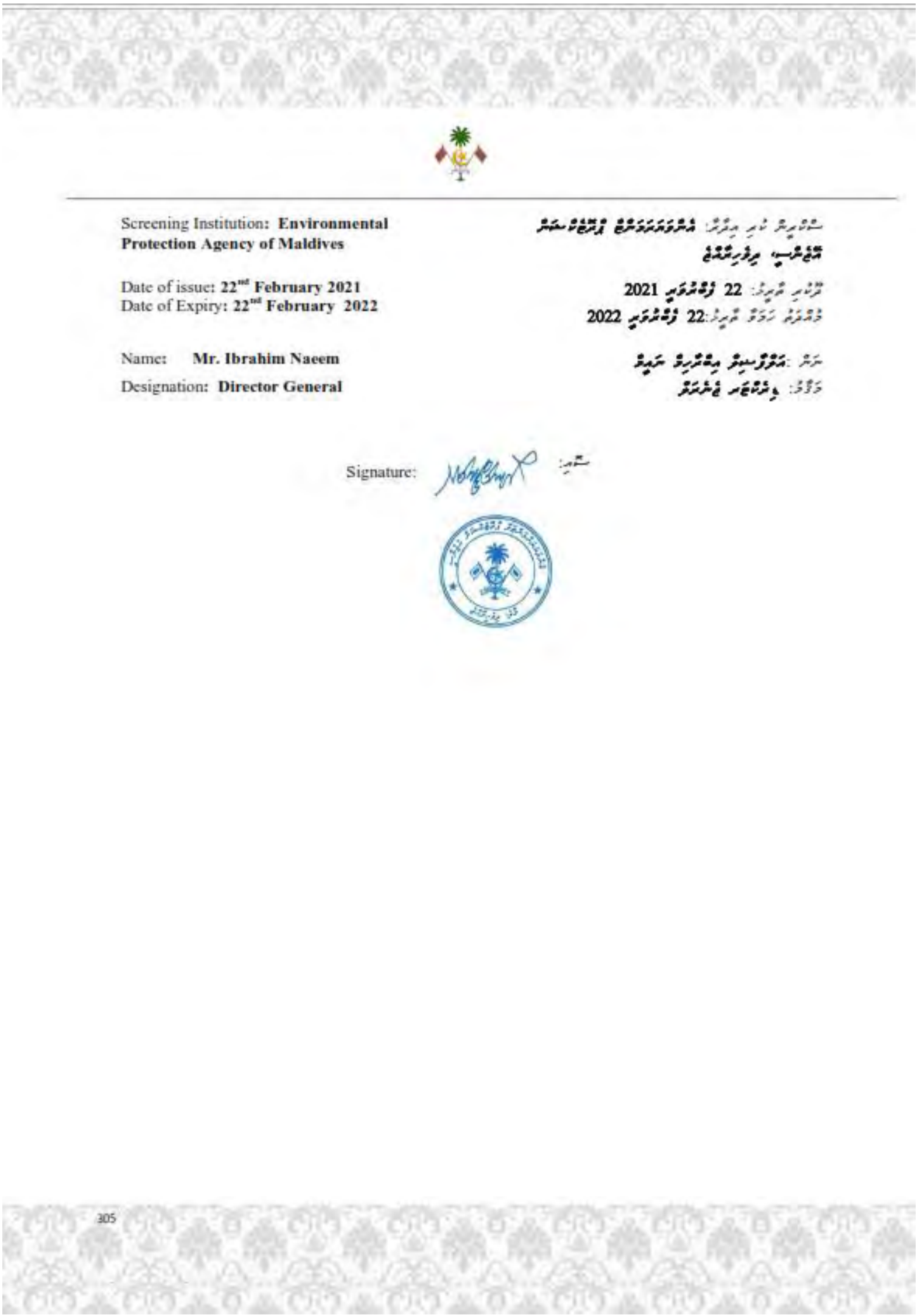
203-ECA/438/2021/38

Screening Decision

This is an official document issued to **Ministry of Environment**, for communicating the decision made after screening of the project: **Upgrading of Grid Infrastructure of Gdh.Thinadhoo- Subcomponent 1- Upgrading Cable Network and Installation of Communication Fibre Network**

This project is likely to cause significant negative environmental impacts. Hence, please submit an EIA report.	☐
Submit an Initial Environmental Examination for this project.	☐
Submit an Environmental Management Plan for this project.	☐
This project is unlikely to have a significant negative impact on the environment. Hence, you may proceed with the project.	☑
The measures stipulated by this agency shall be used to mitigate the negative environmental impacts of the project.	☐

This is an environmental screening. Hence, obtain all necessary approvals/permits from other relevant government authorities before commencement of the project activities. The date of expiry stated in this Environmental Screening Decision Statement is the duration given to implement the decision made by this agency.



Screening Institution: **Environmental Protection Agency of Maldives**

Date of issue: **22nd February 2021**
Date of Expiry: **22nd February 2022**

Name: **Mr. Ibrahim Naeem**
Designation: **Director General**

ސްކްރީނިންގ ކުރި އިދާރާ: **އެންވަޔަރަންމަންޓަލް ޕްރޮޓެކްޝަން އޭޖެންސީ، ދިވެހިރާއްޖެ**

ދޫކުރި ތާރީޚް: **22 ފެބްރުއަރީ 2021**
މުއްދަތު ހަމަވާ ތާރީޚް:**22 ފެބްރުއަރީ 2022**

ނަން :**އަލްފާޟިލް އިބްރާހީމް ނަޢީމް**
މަޤާމު: **ޑިރެކްޓަރ ޖެނެރަލް**

Signature: ސޮއި:

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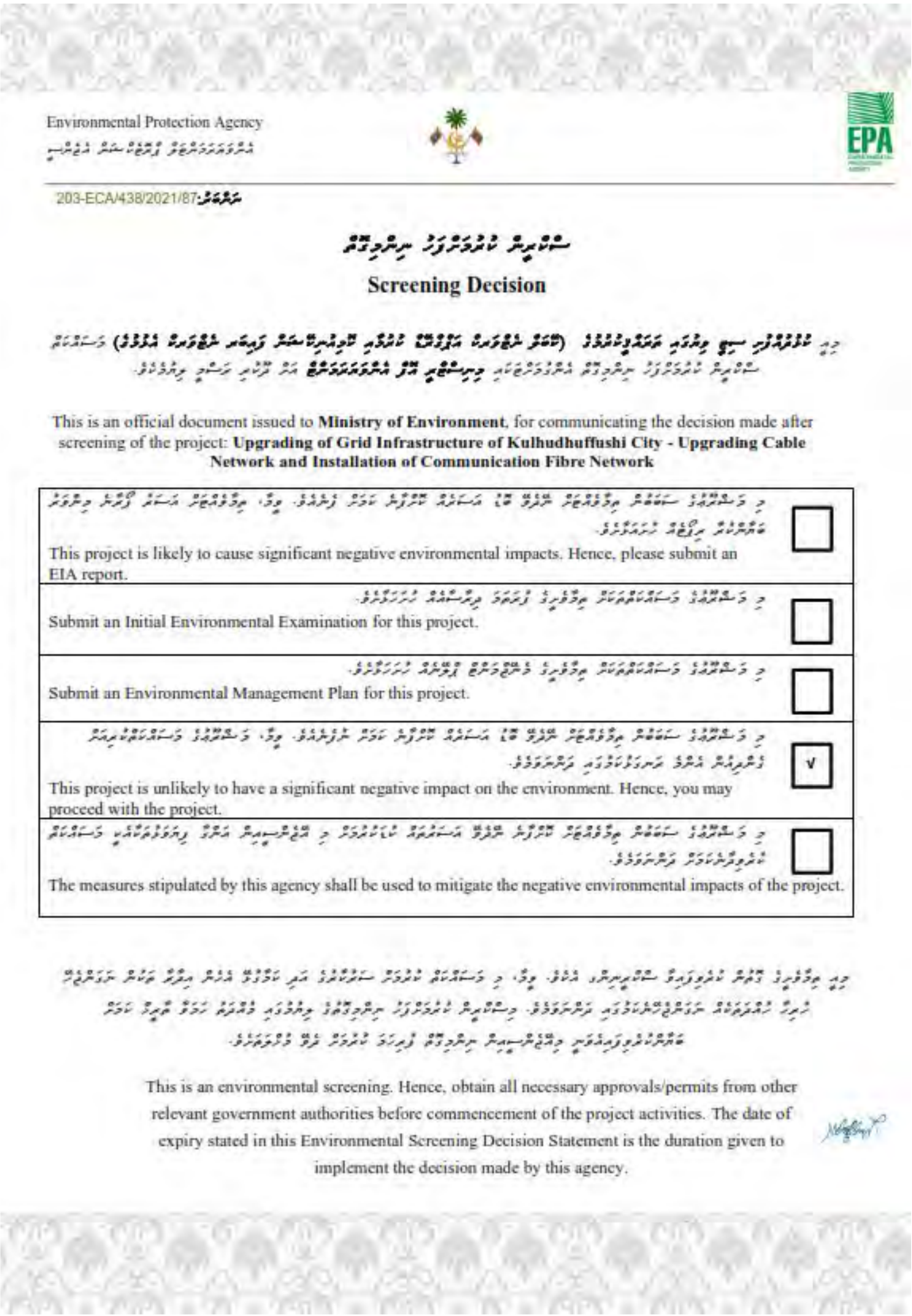


Environmental Protection Agency

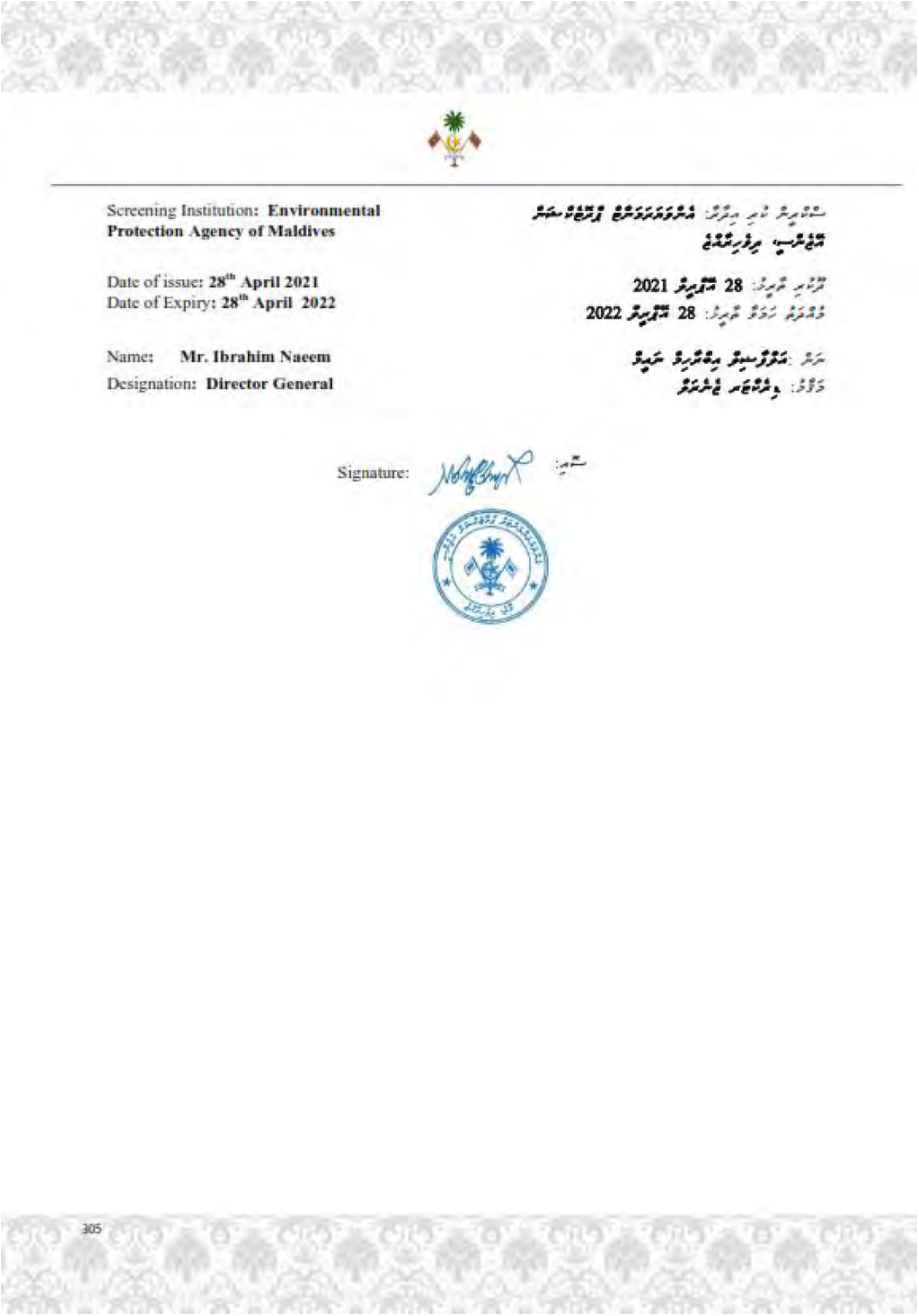
203-ECA/438/2021/87

Screening Decision

This is an official document issued to **Ministry of Environment**, for communicating the decision made after screening of the project: **Upgrading of Grid Infrastructure of Kulhudhuffushi City - Upgrading Cable Network and Installation of Communication Fibre Network**

This project is likely to cause significant negative environmental impacts. Hence, please submit an EIA report.	☐
Submit an Initial Environmental Examination for this project.	☐
Submit an Environmental Management Plan for this project.	☐
This project is unlikely to have a significant negative impact on the environment. Hence, you may proceed with the project.	☑
The measures stipulated by this agency shall be used to mitigate the negative environmental impacts of the project.	☐

This is an environmental screening. Hence, obtain all necessary approvals/permits from other relevant government authorities before commencement of the project activities. The date of expiry stated in this Environmental Screening Decision Statement is the duration given to implement the decision made by this agency.



Screening Institution: **Environmental Protection Agency of Maldives**

Date of issue: **28th April 2021**
Date of Expiry: **28th April 2022**

Name: **Mr. Ibrahim Naeem**
Designation: **Director General**

ސްކްރީނިންގ ކުރި އިދާރާ: **އެންވަޔަރަމަންޓަލް ޕްރޮޓެކްޝަން އޭޖެންސީ، މޯލްޑިވްސް**

ދޫކުރި ތާރީޚު: **28 އޭޕްރިލް 2021**
މުއްދަތު ހަމަވާ ތާރީޚު: **28 އޭޕްރިލް 2022**

ނަން: **އަލްފާޟިލް އިބްރާހީމް ނަޢީމް**
މަޤާމު: **ޑިރެކްޓަރ ޖެނެރަލް**

Signature: ސޮއި:

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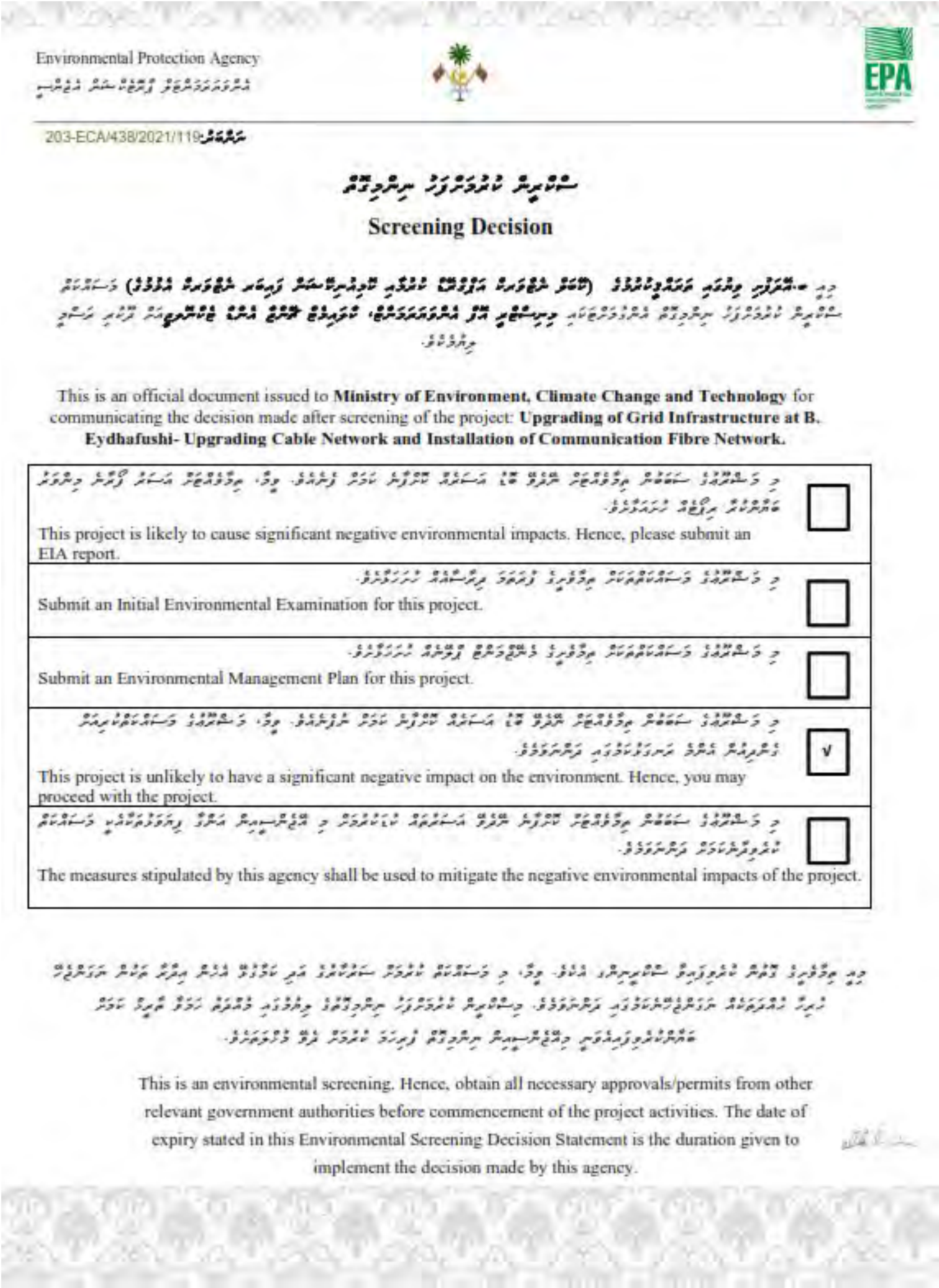

Environmental Protection Agency

203-ECA/438/2021/119

Screening Decision

This is an official document issued to **Ministry of Environment, Climate Change and Technology** for communicating the decision made after screening of the project: **Upgrading of Grid Infrastructure at B. Eydhafushi- Upgrading Cable Network and Installation of Communication Fibre Network.**

☐ This project is likely to cause significant negative environmental impacts. Hence, please submit an EIA report.

☐ Submit an Initial Environmental Examination for this project.

☐ Submit an Environmental Management Plan for this project.

☑ This project is unlikely to have a significant negative impact on the environment. Hence, you may proceed with the project.

☐ The measures stipulated by this agency shall be used to mitigate the negative environmental impacts of the project.

This is an environmental screening. Hence, obtain all necessary approvals/permits from other relevant government authorities before commencement of the project activities. The date of expiry stated in this Environmental Screening Decision Statement is the duration given to implement the decision made by this agency.

Screening Institution: **Environmental Protection Agency of Maldives**

Date of issue: **5th September 2021**
Date of Expiry: **5th September 2022**

Name: **Dr. Ibrahim Mohamed**
Designation: **Deputy Director General**

ސްކްރީނިންގ ކުރި އިދާރާ: **އެންވަޔަރަންމަންޓް ޕްރޮޓެކްޝަން**
އެޖެންސީ، ދިވެހިރާއްޖެ

ދޫކުރި ތާރީޚް: **05 ސެޕްޓެމްބަރ 2021**
މުއްދަތު ހަމަވާ ތާރީޚް: **05 ސެޕްޓެމްބަރ 2022**

ނަން: **ޑޮކްޓަރ އިބްރާހީމް މުޙައްމަދު**
މަޤާމް: **ޑެޕިއުޓީ ޑިރެކްޓަރ ޖެނެރަލް**

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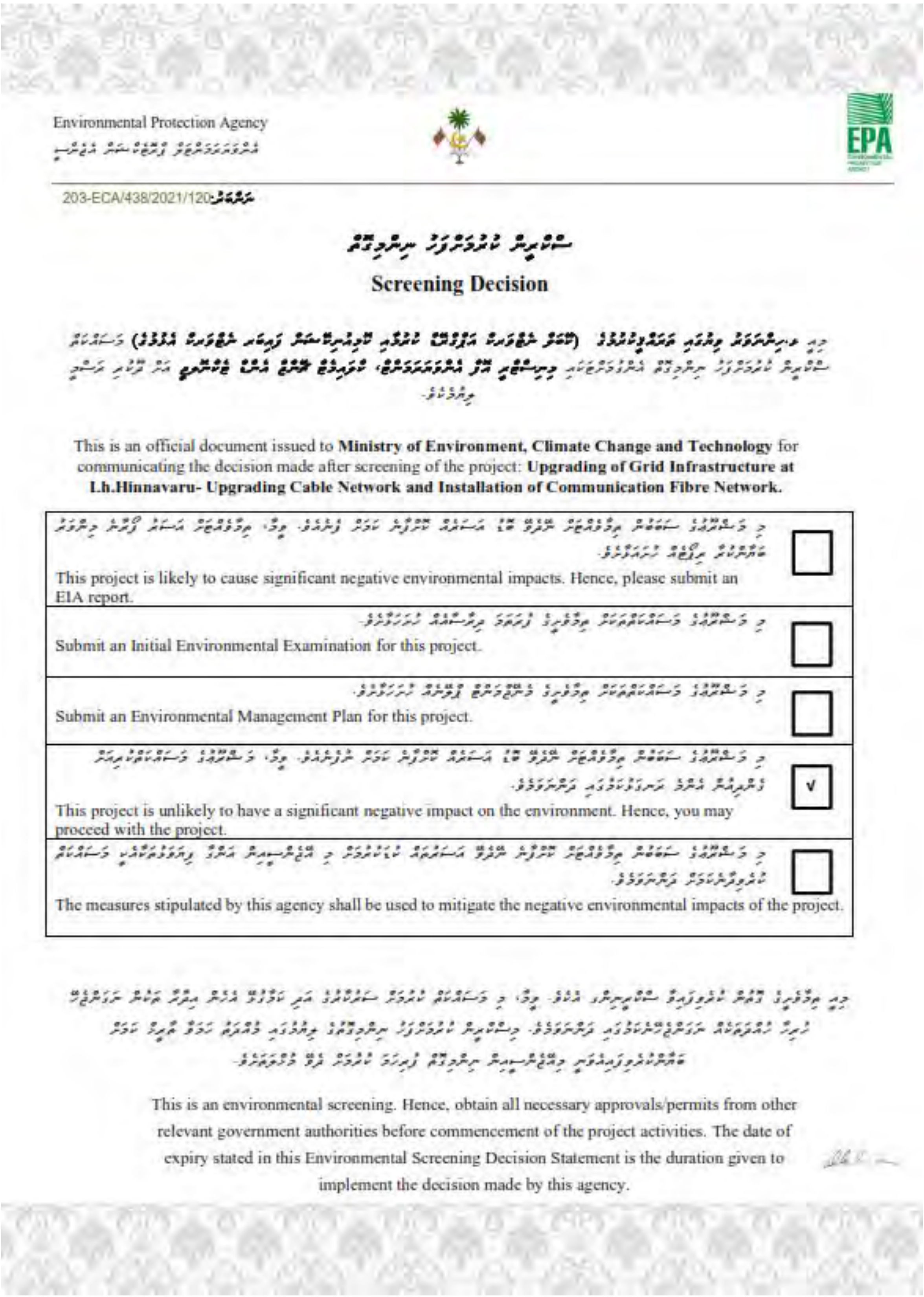


Environmental Protection Agency

EPA

203-ECA/438/2021/120

Screening Decision

This is an official document issued to **Ministry of Environment, Climate Change and Technology** for communicating the decision made after screening of the project: **Upgrading of Grid Infrastructure at Lh.Hinnavaru- Upgrading Cable Network and Installation of Communication Fibre Network.**

☐ This project is likely to cause significant negative environmental impacts. Hence, please submit an EIA report.

☐ Submit an Initial Environmental Examination for this project.

☐ Submit an Environmental Management Plan for this project.

☑ This project is unlikely to have a significant negative impact on the environment. Hence, you may proceed with the project.

☐ The measures stipulated by this agency shall be used to mitigate the negative environmental impacts of the project.

This is an environmental screening. Hence, obtain all necessary approvals/permits from other relevant government authorities before commencement of the project activities. The date of expiry stated in this Environmental Screening Decision Statement is the duration given to implement the decision made by this agency.

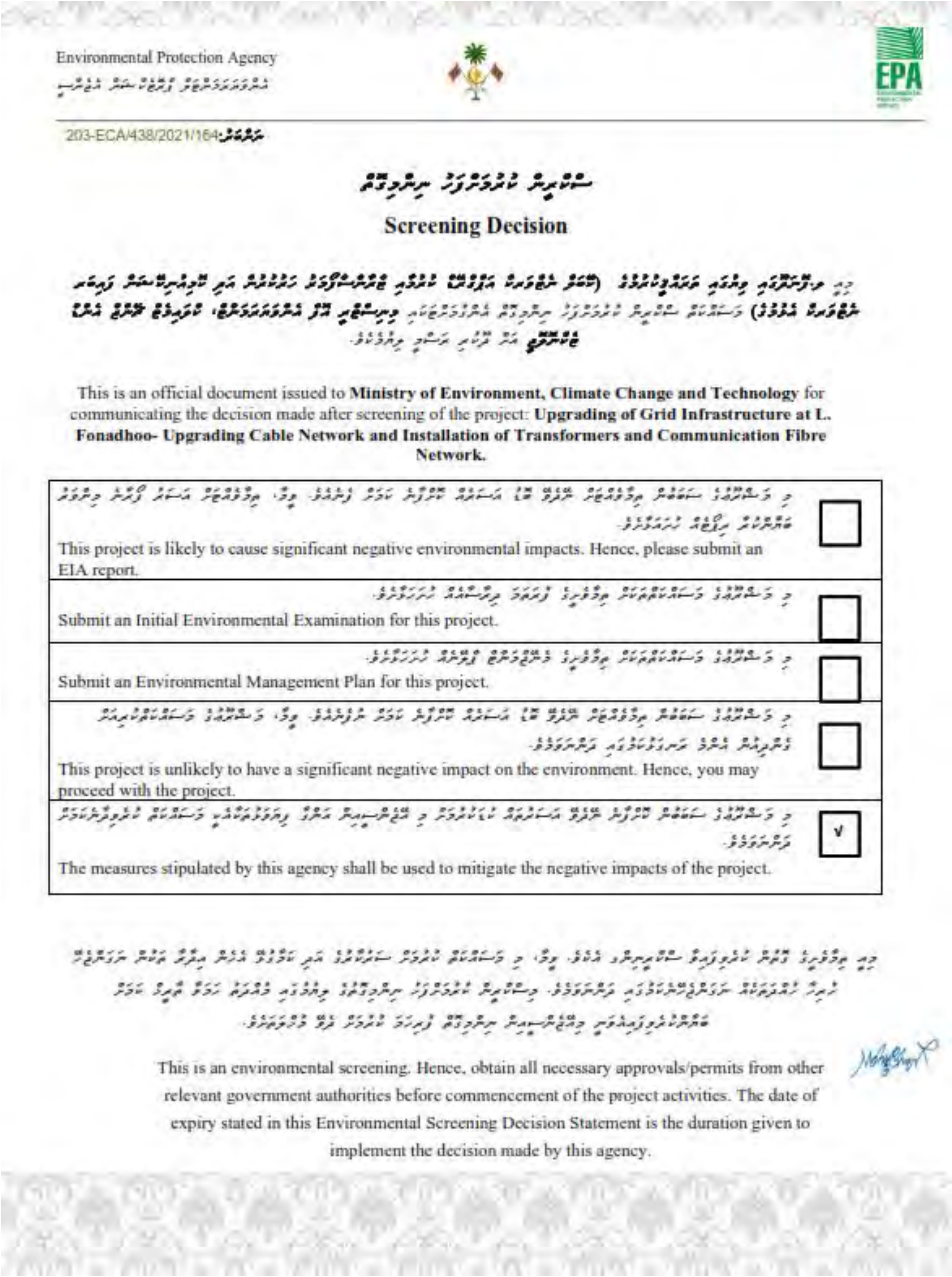
Screening Institution: **Environmental Protection Agency of Maldives**

Date of issue: **5th September 2021**
Date of Expiry: **5th September 2022**

Name: **Dr. Ibrahim Mohamed**
Designation: **Deputy Director General**

Signature:

305



Environmental Protection Agency

203-ECA/438/2021/164

Screening Decision

This is an official document issued to **Ministry of Environment, Climate Change and Technology** for communicating the decision made after screening of the project: **Upgrading of Grid Infrastructure at L. Fonadhoo- Upgrading Cable Network and Installation of Transformers and Communication Fibre Network.**

☐ This project is likely to cause significant negative environmental impacts. Hence, please submit an EIA report.

☐ Submit an Initial Environmental Examination for this project.

☐ Submit an Environmental Management Plan for this project.

☐ This project is unlikely to have a significant negative impact on the environment. Hence, you may proceed with the project.

☑ The measures stipulated by this agency shall be used to mitigate the negative impacts of the project.

This is an environmental screening. Hence, obtain all necessary approvals/permits from other relevant government authorities before commencement of the project activities. The date of expiry stated in this Environmental Screening Decision Statement is the duration given to implement the decision made by this agency.

Mitigation measures:

- All works at the substation locations should be commenced after obtaining land use approval from the Maldives Land and Survey Authority.
- For every palm or tree removed, two palms for each palm removed and two trees for each tree removed, shall be planted on the island of L. Fonadhoo.
- Palms and trees of extraordinary nature should not be uprooted.
- Palms and trees uprooted must be replanted elsewhere in L. Fonadhoo as much as possible.
- If a palm or tree is removed, the hole shall be filled and securely tightened with sand only and nothing else. Dumping any type of waste into a hole created by the removal of a palm or tree, is strictly prohibited.
- Waste generated from the project should be managed according to the Waste Management Regulation of the Maldives.

Screening Institution: **Environmental Protection Agency of Maldives**

Date of issue: **22nd November 2021**
Date of Expiry: **22nd November 2022**

Name: **Mr. Ibrahim Naeem**
Designation: **Director General**

ސްކްރީނިންގ ކުރި އިދާރާ: **އެންވަޔަރަންމަންޓަލް ޕްރޮޓެކްޝަން އޭޖެންސީ**

ދޫކުރި ތާރީޚް: **22 ނޮވެމްބަރ 2021**
މުއްދަތު ހަމަވާ ތާރީޚް: **22 ނޮވެމްބަރ 2022**

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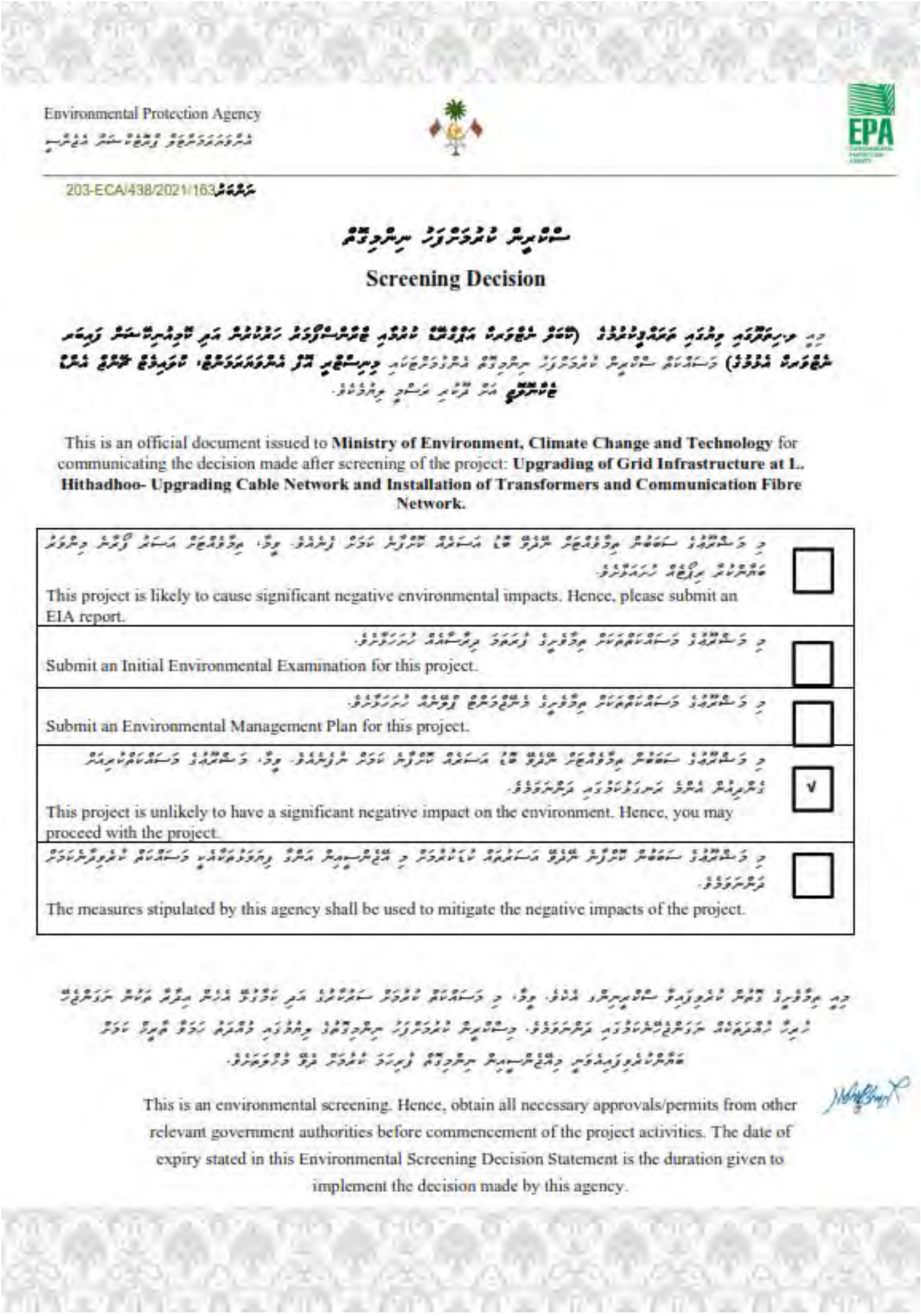

Environmental Protection Agency

203-ECA/438/2021/163

Screening Decision

This is an official document issued to **Ministry of Environment, Climate Change and Technology** for communicating the decision made after screening of the project: **Upgrading of Grid Infrastructure at L. Hithadhoo- Upgrading Cable Network and Installation of Transformers and Communication Fibre Network.**

This project is likely to cause significant negative environmental impacts. Hence, please submit an EIA report.	☐
Submit an Initial Environmental Examination for this project.	☐
Submit an Environmental Management Plan for this project.	☐
This project is unlikely to have a significant negative impact on the environment. Hence, you may proceed with the project.	☑
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Screening Institution: **Environmental Protection Agency of Maldives**

ސްކްރީނިންގ ކުރި އިދާރާ: އެންވަޔަރަމަންޓަލް ޕްރޮޓެކްޝަން އެޖެންސީ

Date of issue: **22nd November 2021**
Date of Expiry: **22nd November 2022**

ދޫކުރި ތާރީޚް: 22 ނޮވެމްބަރ 2021
މުއްދަތު ހަމަވާ ތާރީޚް: 22 ނޮވެމްބަރ 2022

Name: **Mr. Ibrahim Naeem**
Designation: **Director General**

ނަން : އަލްފާޟިލް އިބްރާހީމް ނައީމް
މަޤާމް: ޑިރެކްޓަރ ޖެނެރަލް

Signature: ސޮއި:

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Environmental Protection Agency

203-ECA/438/2021/162

Screening Decision

This is an official document issued to **Ministry of Environment, Climate Change and Technology** for communicating the decision made after screening of the project: **Upgrading of Grid Infrastructure at L. Isdhoo, L.Kalaidhoo and L. Dhanbidhoo- Upgrading Cable Network and Installation of Transformers and Communication Fibre Network.**

This project is likely to cause significant negative environmental impacts. Hence, please submit an EIA report.	☐
Submit an Initial Environmental Examination for this project.	☐
Submit an Environmental Management Plan for this project.	☐
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Mitigation measures:

- For every palm or tree removed, two palms for each palm removed and two trees for each tree removed, shall be planted on the island.
- Palms and trees of extraordinary nature should not be uprooted.
- Palms and trees uprooted must be replanted elsewhere in L. Isdhoo and L.Kalaidhoo as much as possible.
- If a palm or tree is removed, the hole shall be filled and securely tightened with sand only and nothing else. Dumping any type of waste into a hole created by the removal of a palm or tree, is strictly prohibited.
- Waste generated from the project should be managed according to the Waste Management Regulation of the Maldives.
- Dewatering work should be carried out after obtaining approval from the Utility Regulatory Authority.

Screening Institution: **Environmental Protection Agency of Maldives**

ސްކްރީނިންގ ކުރި އިދާރާ: **އެންވަޔަރަންމަންޓަލް ޕްރޮޓެކްޝަން އޭޖެންސީ**

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ދޫކުރި ތާރީޚް: **22 ނޮވެމްބަރ 2021**
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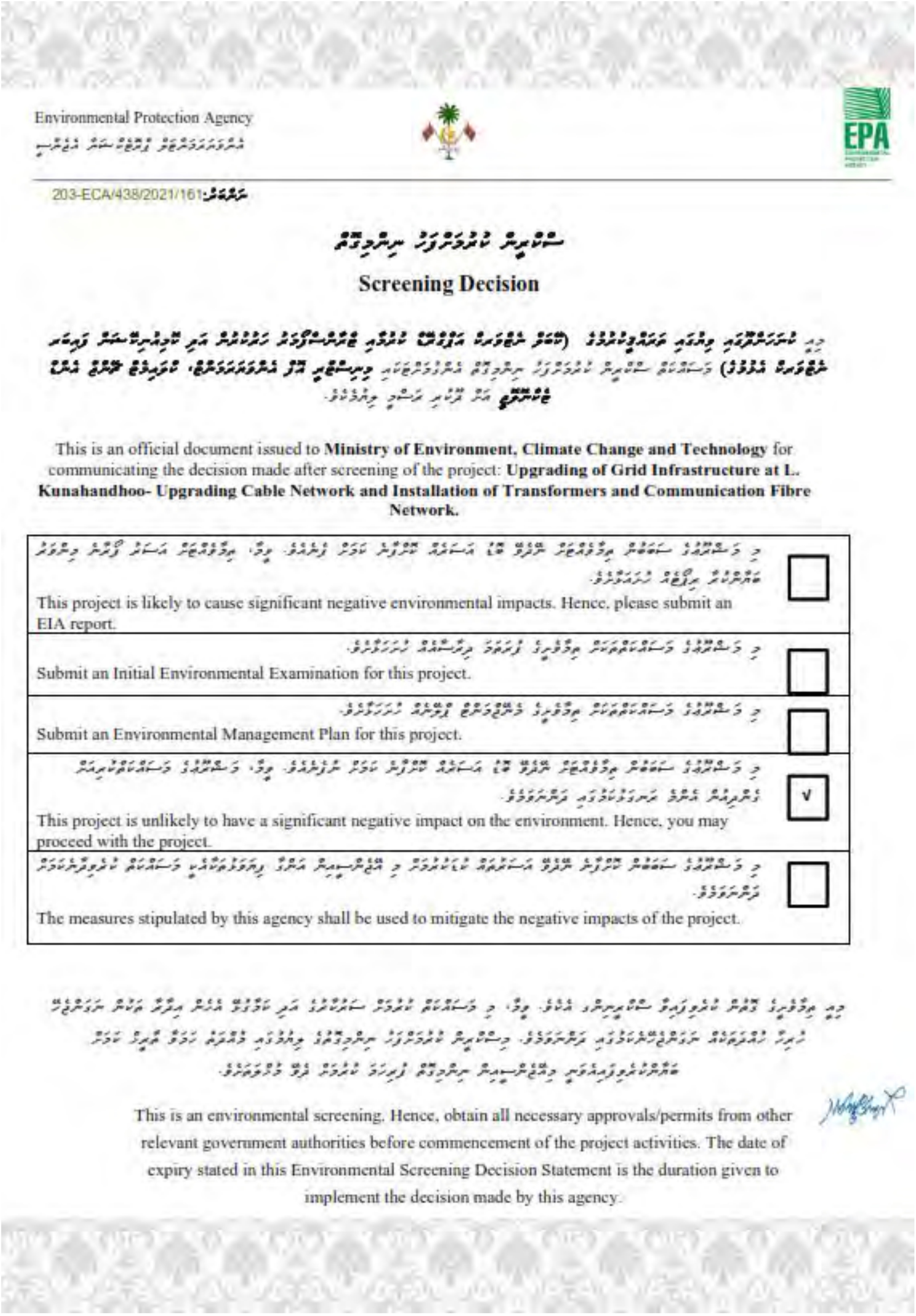
Name: **Mr. Ibrahim Naeem**
Designation: **Director General**

ނަން : **އަލްފާޟިލް އިބްރާހީމް ނައީމް**
މަޤާމު: **ޑިރެކްޓަރ ޖެނެރަލް**

Signature: ސޮއި:



Environmental Protection Agency

ނަންބަރު: 203-ECA/438/2021/161

Screening Decision

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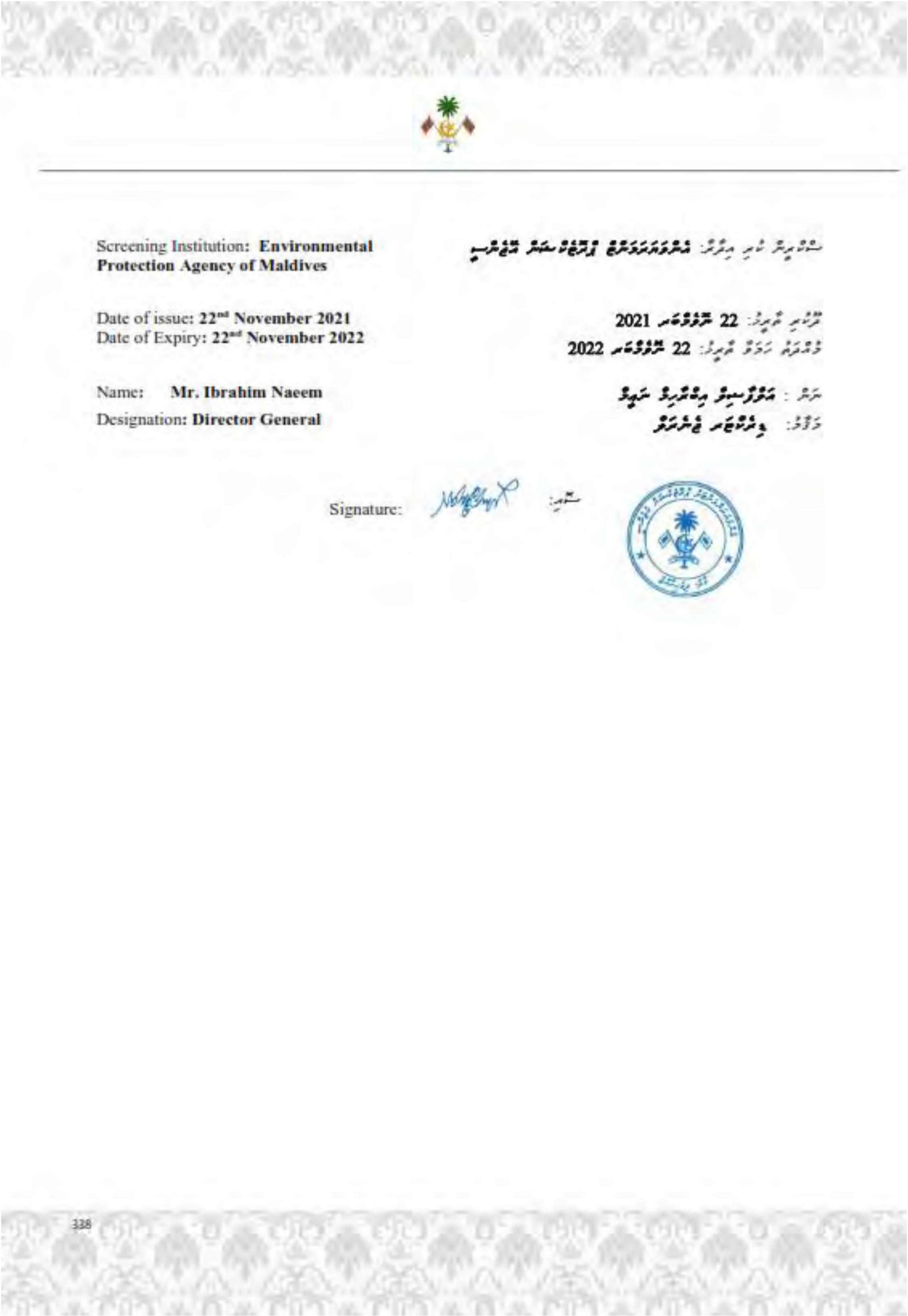

Screening Institution: **Environmental Protection Agency of Maldives**

ސްކްރީނިންގ ކުރި އިދާރާ: **އެންވަޔަރަމަންޓަލް ޕްރޮޓެކްޝަން އެޖެންސީ**

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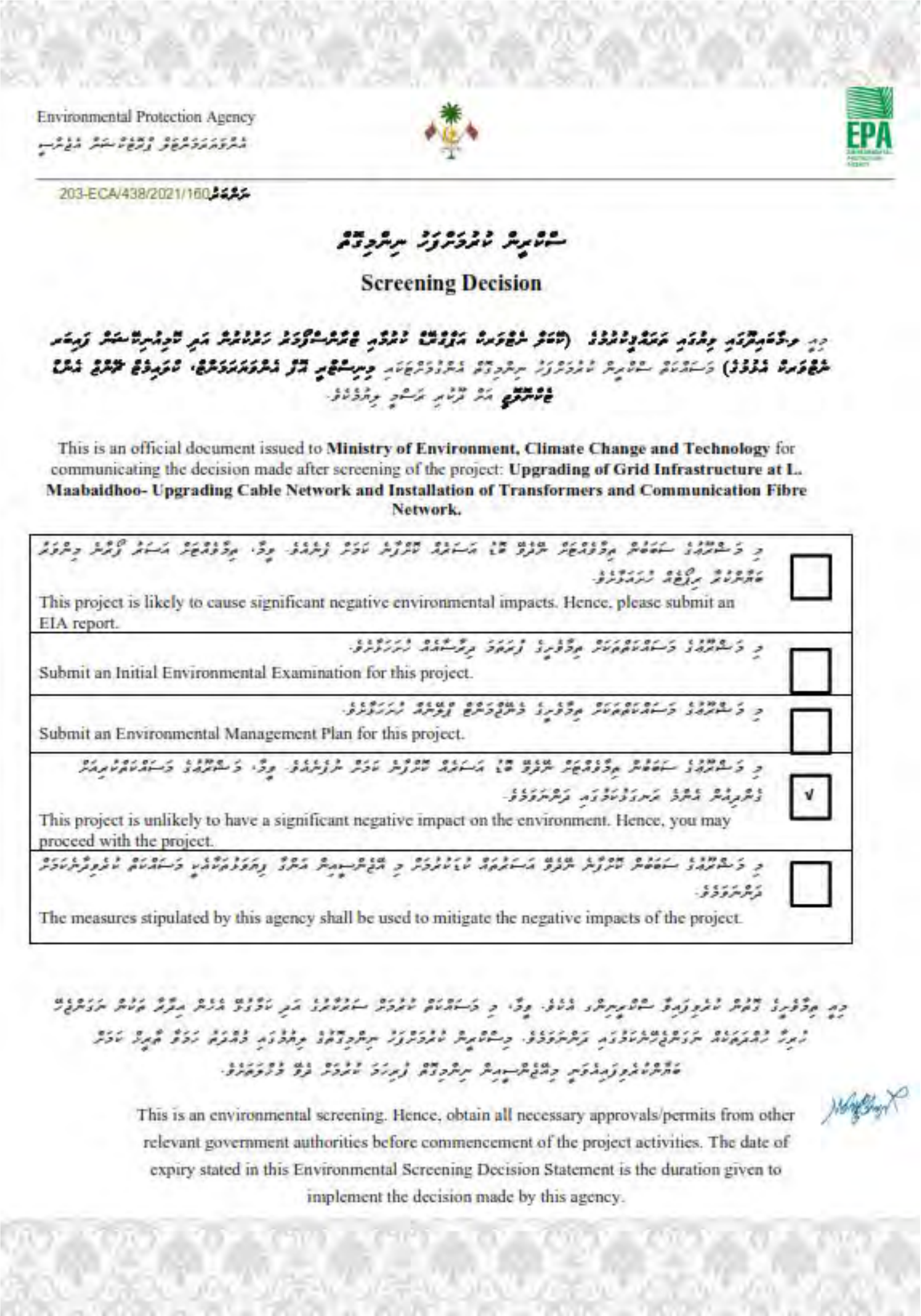
Name: **Mr. Ibrahim Naeem**
Designation: **Director General**

ނަން : **އަލްއުސްތާޛު އިބްރާހީމް ނަޢީމް**
މަޤާމު: **ޑިރެކްޓަރ ޖެނެރަލް**

Signature: ސޮއި:



Environmental Protection Agency

203-ECA/438/2021/160

Screening Decision

This is an official document issued to **Ministry of Environment, Climate Change and Technology** for communicating the decision made after screening of the project: **Upgrading of Grid Infrastructure at L. Maabaidhoo- Upgrading Cable Network and Installation of Transformers and Communication Fibre Network.**

This project is likely to cause significant negative environmental impacts. Hence, please submit an EIA report.	☐
Submit an Initial Environmental Examination for this project.	☐
Submit an Environmental Management Plan for this project.	☐
This project is unlikely to have a significant negative impact on the environment. Hence, you may proceed with the project.	☑
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Screening Institution: **Environmental Protection Agency of Maldives**

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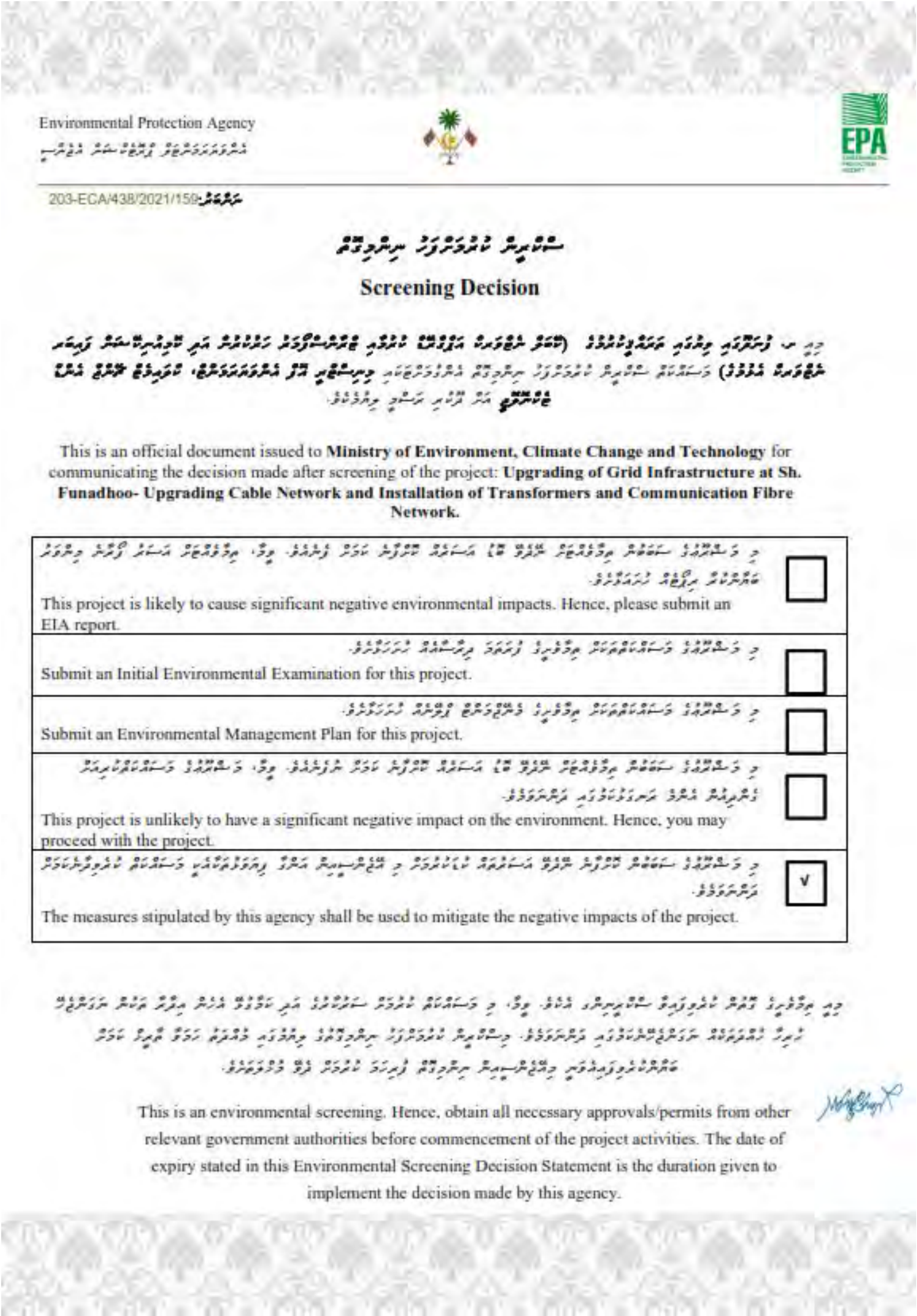
Name: **Mr. Ibrahim Naeem**
Designation: **Director General**

ނަން : **އަލްފާޟިލް އިބްރާހީމް ނައީމް**
މަޤާމު: **ޑިރެކްޓަރ ޖެނެރަލް**

Signature: ސޮއި:

338



Environmental Protection Agency

203-ECA/438/2021/159

Screening Decision

This is an official document issued to **Ministry of Environment, Climate Change and Technology** for communicating the decision made after screening of the project: **Upgrading of Grid Infrastructure at Sh. Funadhoo- Upgrading Cable Network and Installation of Transformers and Communication Fibre Network.**

☐ This project is likely to cause significant negative environmental impacts. Hence, please submit an EIA report.

☐ Submit an Initial Environmental Examination for this project.

☐ Submit an Environmental Management Plan for this project.

☐ This project is unlikely to have a significant negative impact on the environment. Hence, you may proceed with the project.

☑ The measures stipulated by this agency shall be used to mitigate the negative impacts of the project.

This is an environmental screening. Hence, obtain all necessary approvals/permits from other relevant government authorities before commencement of the project activities. The date of expiry stated in this Environmental Screening Decision Statement is the duration given to implement the decision made by this agency.

Mitigation measures:

- All works at the substation locations should be commenced after obtaining land use approval from the Maldives Land and Survey Authority.
- For every palm or tree removed, two palms for each palm removed and two trees for each tree removed, shall be planted on the island of Sh. Funadhoo.
- Palms and trees of extraordinary nature should not be uprooted.
- No palms and trees within the wetland area should be uprooted.
- No palms and trees should be removed from within the 15 meters outward of the wetland area.
- Palms and trees uprooted must be replanted elsewhere in Sh. Funadhoo as much as possible.
- If a palm or tree is removed, the hole shall be filled and securely tightened with sand only and nothing else. Dumping any type of waste into a hole created by the removal of a palm or tree, is strictly prohibited.
- Waste generated from the project should be managed according to the Waste Management Regulation of the Maldives.
- Dewatering work should be carried out after obtaining approval from the Utility Regulatory Authority.

Screening Institution: **Environmental Protection Agency of Maldives**

ސްކްރީނިންގ ކުރި އިދާރާ: **އެންވަޔަރަމަންޓަލް ޕްރޮޓެކްޝަން އޭޖެންސީ**

Date of issue: **22nd November 2021**
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Name: **Mr. Ibrahim Naeem**
Designation: **Director General**

ނަން : **އަލްފާޟިލް އިބްރާހީމް ނައީމް**
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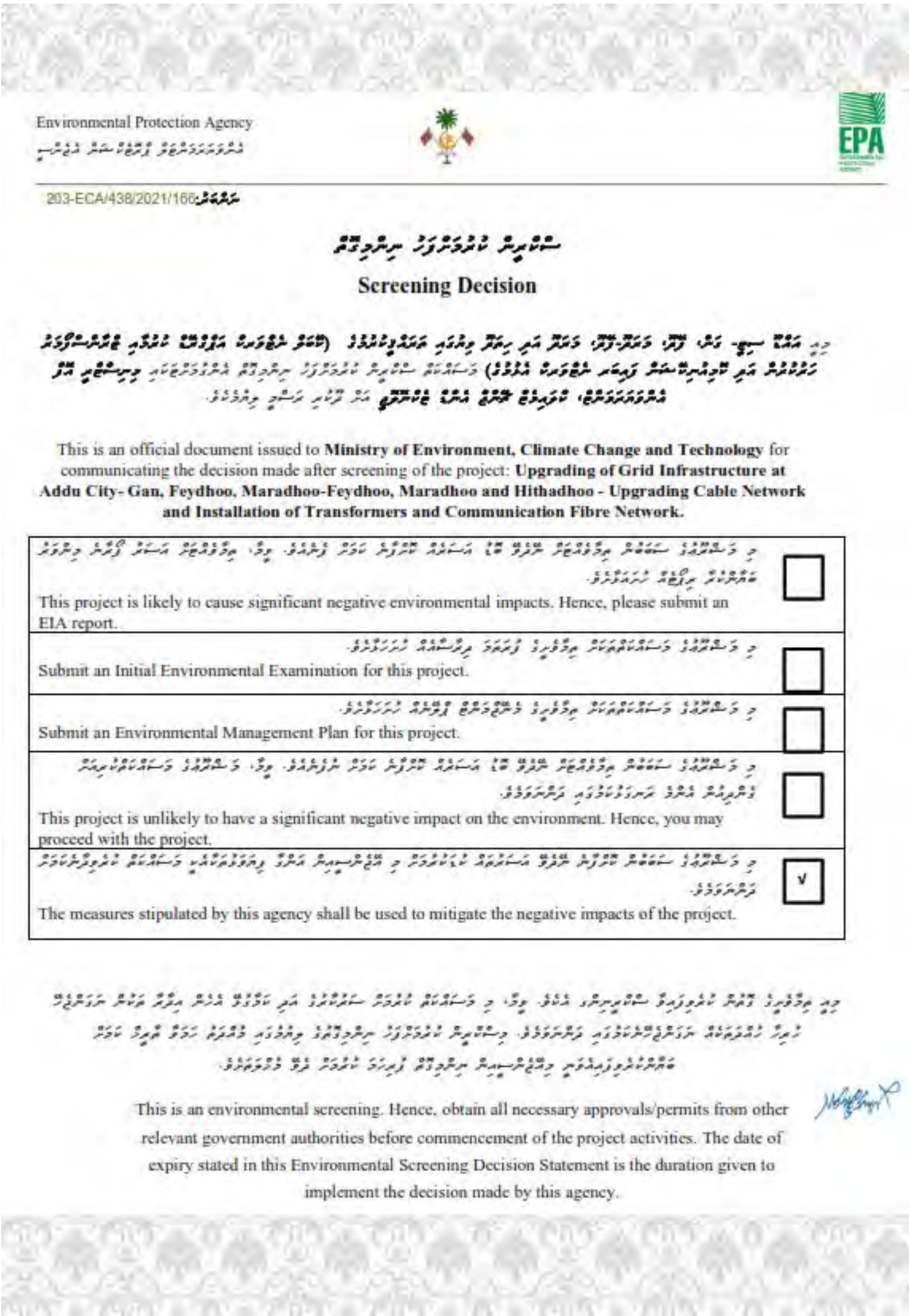
Signature: ސޮއި:



Environmental Protection Agency

203-ECA/438/2021/166

Screening Decision

This is an official document issued to **Ministry of Environment, Climate Change and Technology** for communicating the decision made after screening of the project: **Upgrading of Grid Infrastructure at Addu City- Gan, Feydhoo, Maradhoo-Feydhoo, Maradhoo and Hithadhoo - Upgrading Cable Network and Installation of Transformers and Communication Fibre Network.**

This project is likely to cause significant negative environmental impacts. Hence, please submit an EIA report.	☐
Submit an Initial Environmental Examination for this project.	☐
Submit an Environmental Management Plan for this project.	☐
This project is unlikely to have a significant negative impact on the environment. Hence, you may proceed with the project.	☐
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This is an environmental screening. Hence, obtain all necessary approvals/permits from other relevant government authorities before commencement of the project activities. The date of expiry stated in this Environmental Screening Decision Statement is the duration given to implement the decision made by this agency.

Mitigation measures:

- All works at the new substation location should be commenced after obtaining land use approval from the Maldives Land and Survey Authority.
- For every palm or tree removed, two palms for each palm removed and two trees for each tree removed, shall be planted on the island.
- Palms and trees of extraordinary nature should not be uprooted.
- No palms and trees within the Protected Area should be uprooted.
- No palms and trees should be removed from within the 15 meters outward of the Maakilhi Protected Area.
- Palms and trees uprooted must be replanted elsewhere in in the island as much as possible.
- If a palm or tree is removed, the hole shall be filled and securely tightened with sand only and nothing else. Dumping any type of waste into a hole created by the removal of a palm or tree, is strictly prohibited.
- Waste generated from the project should be managed according to the Waste Management Regulation of the Maldives.
- Dewatering work (if any) should be carried out after obtaining approval from the Utility Regulatory Authority.

Screening Institution: **Environmental Protection Agency of Maldives**

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Date of issue: **25th November 2021**
Date of Expiry: **25th November 2022**

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Name: **Mr. Ibrahim Naeem**
Designation: **Director General**

ނަން : **އަލްފާޟިލް އިބްރާހީމް ނަޢީމް**
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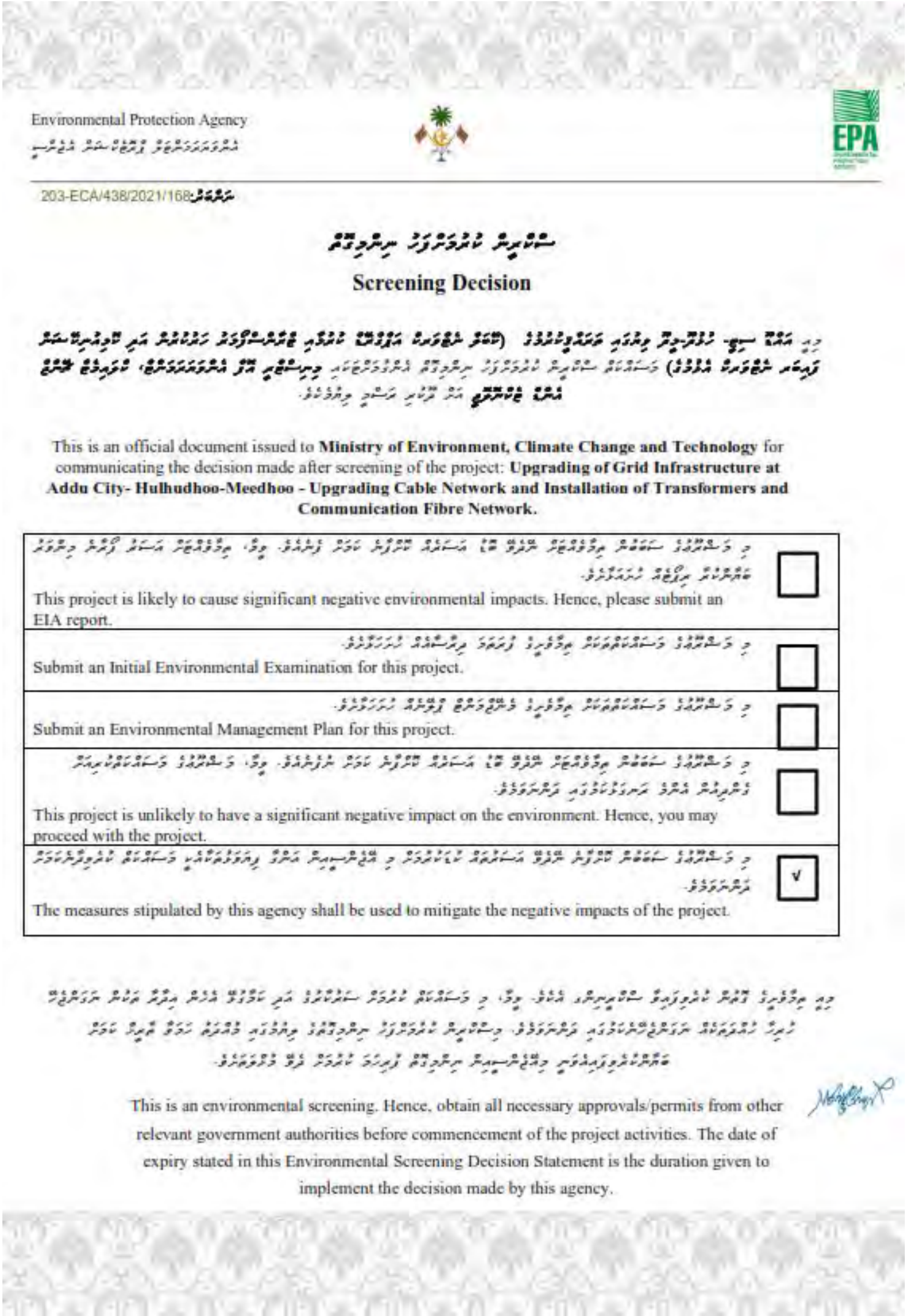

Environmental Protection Agency

203-ECA/438/2021/168

Screening Decision

This is an official document issued to **Ministry of Environment, Climate Change and Technology** for communicating the decision made after screening of the project: **Upgrading of Grid Infrastructure at Addu City- Hulhudhoo-Meedhoo - Upgrading Cable Network and Installation of Transformers and Communication Fibre Network.**

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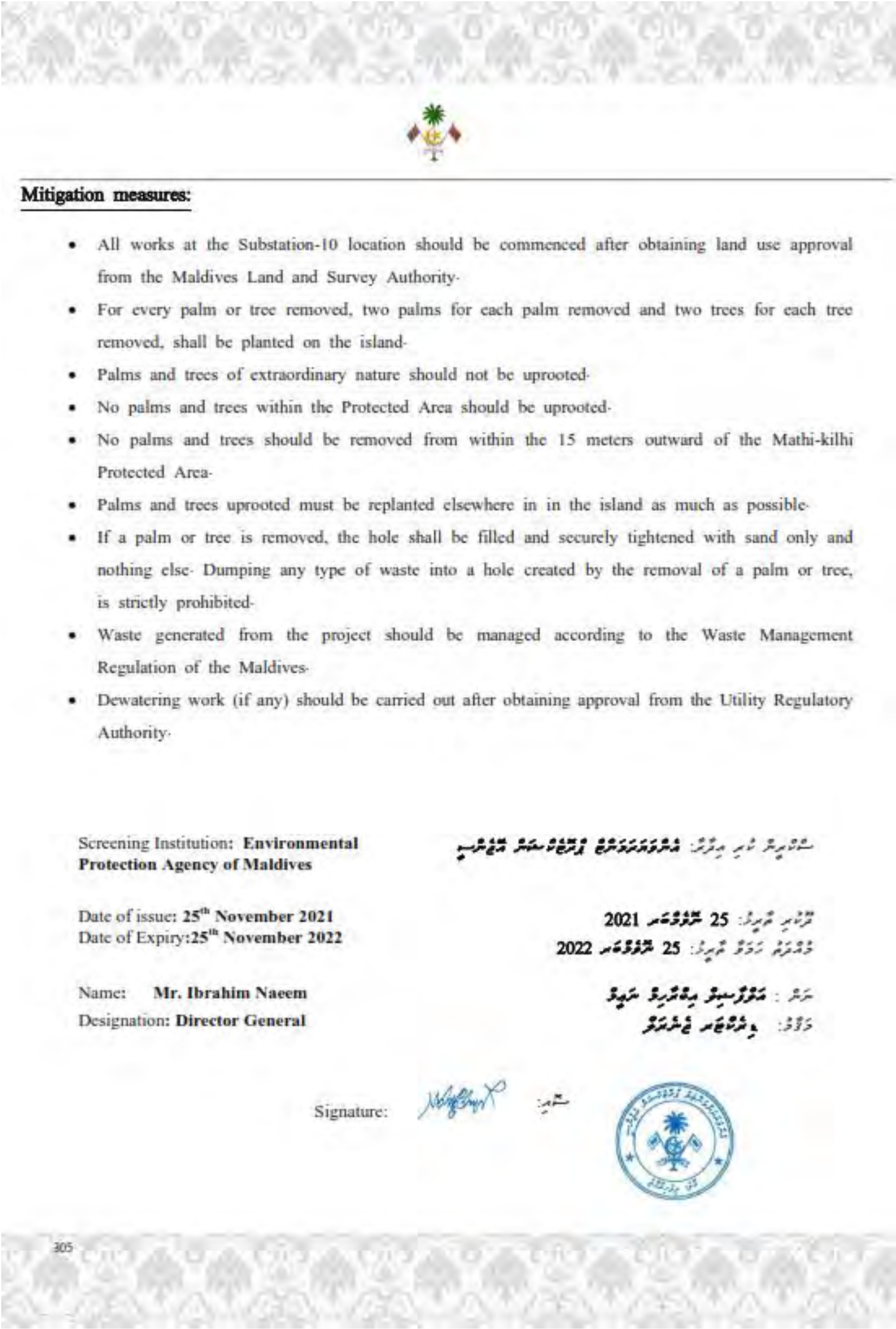

Mitigation measures:

- All works at the Substation-10 location should be commenced after obtaining land use approval from the Maldives Land and Survey Authority.
- For every palm or tree removed, two palms for each palm removed and two trees for each tree removed, shall be planted on the island.
- Palms and trees of extraordinary nature should not be uprooted.
- No palms and trees within the Protected Area should be uprooted.
- No palms and trees should be removed from within the 15 meters outward of the Mathi-kilhi Protected Area.
- Palms and trees uprooted must be replanted elsewhere in in the island as much as possible.
- If a palm or tree is removed, the hole shall be filled and securely tightened with sand only and nothing else. Dumping any type of waste into a hole created by the removal of a palm or tree, is strictly prohibited.
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Screening Institution: **Environmental Protection Agency of Maldives**

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Name: **Mr. Ibrahim Naeem**
Designation: **Director General**

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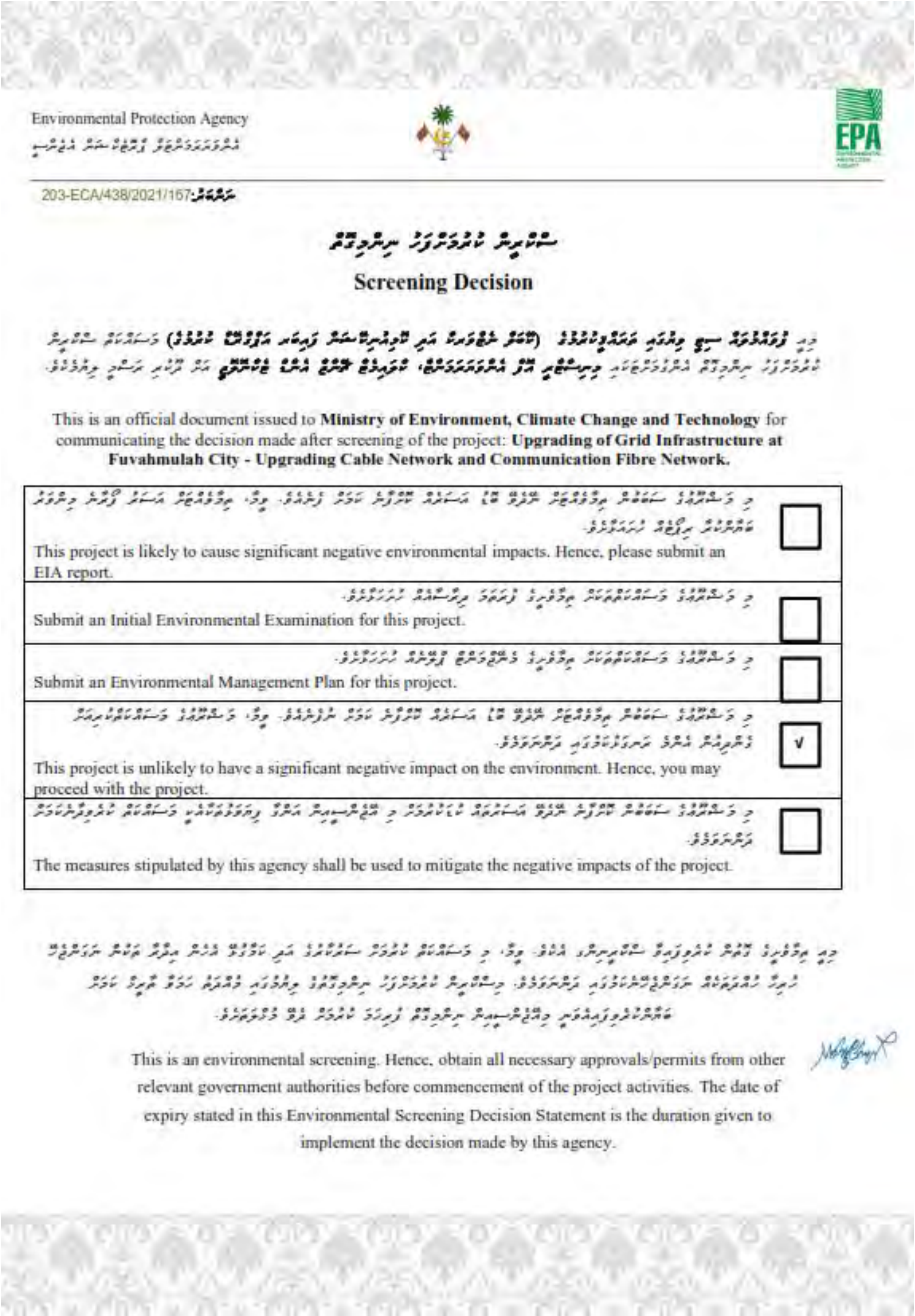
Signature: ސޮއި:



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Screening Decision

This is an official document issued to **Ministry of Environment, Climate Change and Technology** for communicating the decision made after screening of the project: **Upgrading of Grid Infrastructure at Fuvahmulah City - Upgrading Cable Network and Communication Fibre Network.**

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Name: **Mr. Ibrahim Naeem**

Designation: **Director General**

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މަޤާމު: **ޑިރެކްޓަރ ޖެނެރަލް**

Signature:

ސޮއި:

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Annex 2: General Description of Construction Activities under Grid Upgrading

Given below is the general method that needs to be followed when laying cables (both MV and LV) and Communication fibre network:

- First, the trench shall be excavated to 1 meter
- Then the trench shall be filled with minimum of 5cm thick layer of clean or screened sand. The power cables shall be laid on this layer.
- A layer of at least 10 cm of clean or screened sand shall be deposited immediately over the cable.
- A yellow plastic warning tape shall then be laid on this layer for the entire length of the cable route, followed by a soft layer of sand carefully rammed. The yellow plastic warning tape shall have printed in black the following message;

CAUTION CAUTION CAUTION ELECTRIC CABLE BELOW

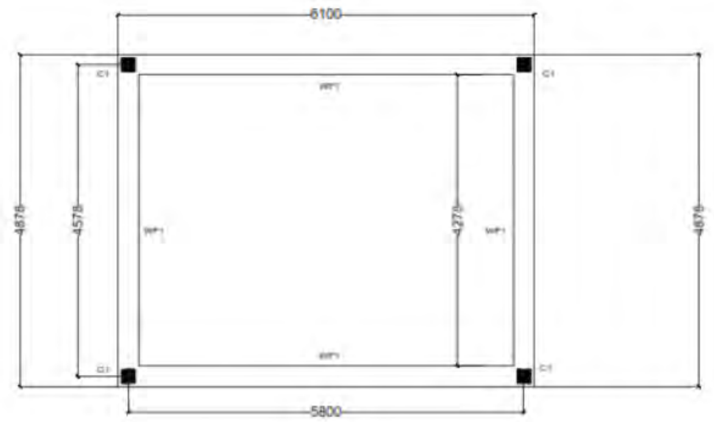
- Cable trench shall be cleaned from dirt etc. before closing.
- Trenches shall be closed as soon as possible to avoid excessive ingress of dirt, damage and inconvenience to the pedestrians and traffic.
- Only excavated material for trenching shall be used for backfilling or sand purchased specifically for this purpose.
- The trench shall be filled and levelled by the contractor to the existing level prior to trenching.
- Where several cables occupy the same trench appropriate distances and separation methods shall be used as per the installation standards of URA.

Some of the islands where cables are to be laid have paved roads and dedicated ducts for cable laying in these islands the dedicated ducts shall be utilized for installation of the cables.

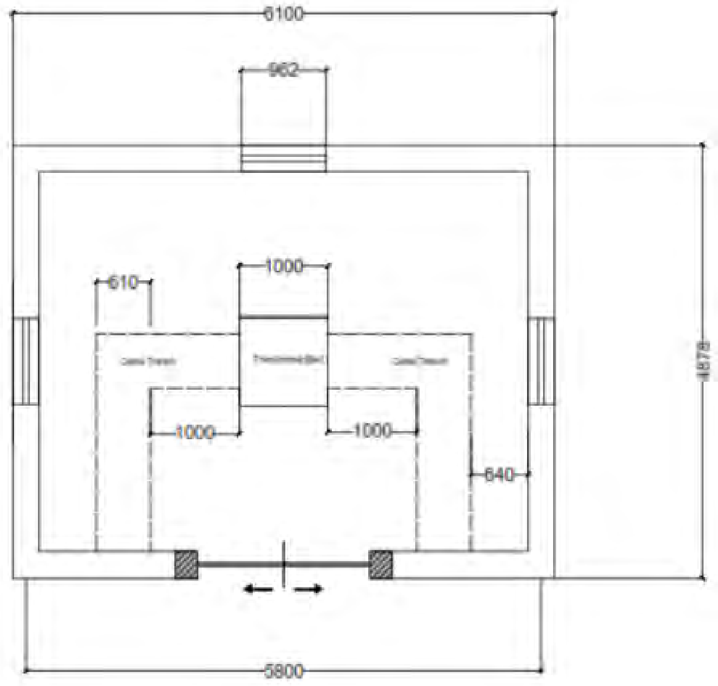
In some islands the cables cross ashphalt roads and there are no appropriate crossing provisions. In such cases the contractor will be required to cut the ashphalt and resurface following cable burying works or alternatively the contractor may use horizontal directional drilling for crossing of ashphalt roads.

Construction of Substations

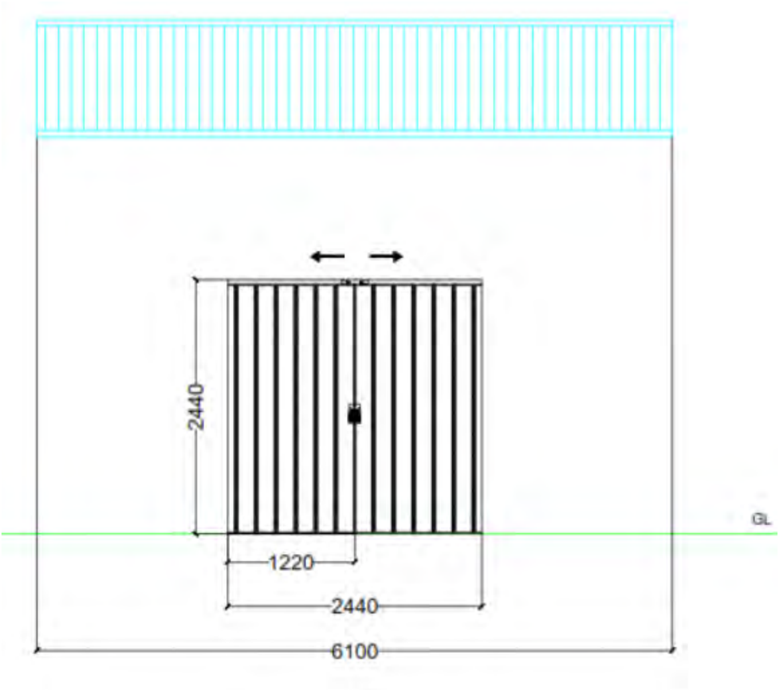
For islands where MV networks are to be installed Substations need to be constructed to house the transformers and the related switch gear units. The Figure below shows are typical layout drawing of substations to be constructed under the project.



Foundation Details



Floor Plan



Front elevation

The steps involved in construction will be for a simple single-story building with raft foundation. The steps can be summarized as below:

1. Clearance of shrubs and levelling
2. Foundation works (raft foundation)
3. Brick works
4. Finishing works

Other than cable laying and substations construction, internal works within the powerhouse, existing substations and installation of distribution boxes will be undertaken in all islands.

Annex 3: Detailed concept for each island

1. Thinadhoo

i. General Description of the project

This subproject involves grid modernization and upgrading at Thinadhoo under component 3 of the project. The project involves the following subcomponents:

1. Upgrading MV cable network
2. Communication Fibre network
3. Installation new Substations

ii. Upgrading Existing MV cable network

Expanding of the 11 KV MV ring main network of Thinadhoo to establish electricity distribution network in the reclaimed area of Thinadhoo. This include installation of approximately 2.35 km of new conductor lines (3Cx 185 sqmm, 11 KV cables) connecting the following substations (marked in map).

- Substation No 13 to No 15
- Substation No 16 to No 17
- Substation No 17 to No 18
- Substation No 18 to No 12

Upgrading the existing cable routes (replacing existing cables) connecting the following substations (marked in map) to 3Cx185 sqmm of medium voltage power lines which is equivalent to a total of 2.4 km cables approx.

- Substation No 10 to No 11
- Substation No 11 to No 12
- Substation No 12 to No 13
- Substation No 15 to No 16
- Subsation No 13 to No 14

iii. Communication Fibre network

Establishing a dedicated fibre network for real time operation and monitoring of the various sub components of the hybrid grid (solar PV, BESS, Diesel generators) and all the substations forming the MV ring of the network. The fibre network connecting the substations listed under point 1 above will follow the route as the new/replacement power lines. In addition, the route for the remaining substations (SS 14 to PH Transformer) and PV sites to PH. The route of fibre network is marked in blue in Figure 2. The same trench as the MV network will be used for the purpose of communication network.

iv. New Substations

Installation of 4 no's of step-down transformers (800 KVA) (SS-18, SS-17, SS-16, SS-15)[2] and related switchgear is planned to cater the transmission requirements of the expanded network for the mentioned reclaimed area. The transformers will stepdown the electricity at 11kV from the main ring to distribute to LV feeders down the network which carry power to the customers (Figure 1). All these transformers will be placed in transformer huts. In addition, two existing transformers within existing substations will be replaced.

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[2] Land approval attained for 05 new substations in reclaimed land (see Annex 1) there is discussion based on fund availability that all five will be installed through the project.

2. Fuvahmulah City

For Fuvahmulah City under grid upgrading the works are only minor as it will involve only interconnection of solar PV to existing grid. Figure below shows the cable route for interconnection.

3.Hulhudhoo-Meedhoo

i. Installation of MV transmission network and Communication optical fibre

The existing transmission and distribution network for Hulhudhoo and Meedhoo islands are planned to be upgraded. Currently the transmission is achieved through a radial type network with two feeders F1 and F2 serving the load centres with F1 connecting Substation no's 1 to 3 and F2 connecting substation no's 4 to 8. The cable size for the existing lines is 3C x 70 sq mm.

FENAKA has plans to relocate the PH to a location further from the residential area. As part of the upgrading works distribution power lines will be installed to serve from the new PH location to existing loads (PH relocation or construction will not be part of works carried under ARISE).

The upgraded transmission network will consist of two rings with ring 1 supplied by feeder 1 and feeder 2 from PH connecting substation no's (1,9,13,2,3,10) and ring 2 supplied by feeder 3 and feeder 4 connecting substation no's (4,5,6,7,12). An interconnection of the two rings is achieved with a link between SS13 and SS4 (Figure 1).

The existing MV cables for the transmission lines will be expanded to cover new sections and the existing lines will also be upgrade from 70 sqmm cables to 120 sqmm cables.

The communication fibre network will be established along the same route as the MV cable laying route (Figure below).

ii. Construction/Installation of new transformer substations

3 No’s of new substations (SS10, SS09, SS13) will be added to the expanded network (SS7 to SS13) for stepdown of the electricity at 11kV from the main lines to LV feeders down the network which carry power to the customers (Figure above).

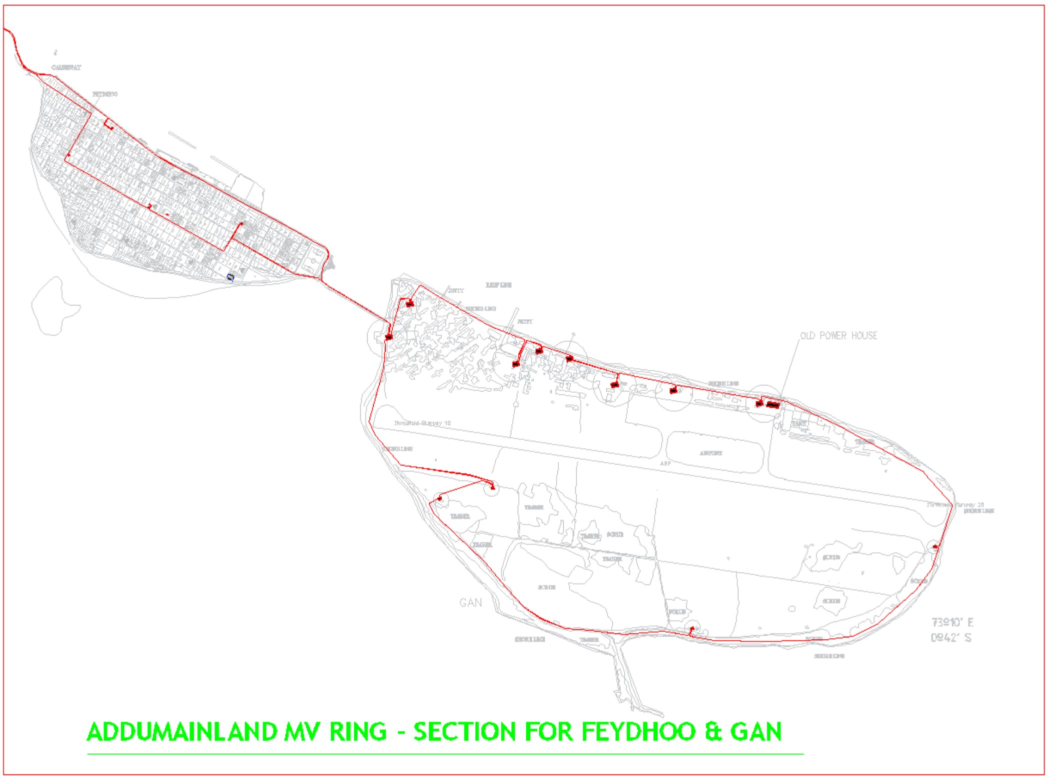
4. Hithadhoo, Maradhoo, Maradhoo-Feydhoo, Feydhoo, Gan

i. Description of the project

For Addu City, Hithadhoo, Maradhoo, Maradhoo-Feydhoo, Feydhoo and Gan under grid upgrading the works will involve expansion of the existing MV grid network, this is to facilitate the PV installation through the project and to minimize voltage drop and to cater to growth in electricity demand in Addu City. Detailed scope is given in the sections below.

iii. Installation of MV transmission network and Communication optical fibre

- Replacing the 3Cx70 sqmm, medium voltage, ring main distribution cable network for Addu-mainland with 3Cx185 sqmm cables as per the marked routes in the below maps.
- Installation of fiber optic cable communication ring along the same route as the MV cable network.
- Installation of new powerhouse main panel.



iv. Transformer upgrades and installation of new transformers

Replacement of transformers at substations 10 (500 KVA) (near Hussain Raha pre-school), 14 (500 KVA) (near FENAKA Marukazee Engineenugey office), 18 (Medhe Aari magu infront of media center), 48 (200 KVA) (Southern utilities limited, bi-water Moolekede station) and 52 (500 KVA) (Bi-water pumping station near Gaburusthaan) with higher rating transformers of 800 KVA capacity equipped with ring main units and low voltage panels.

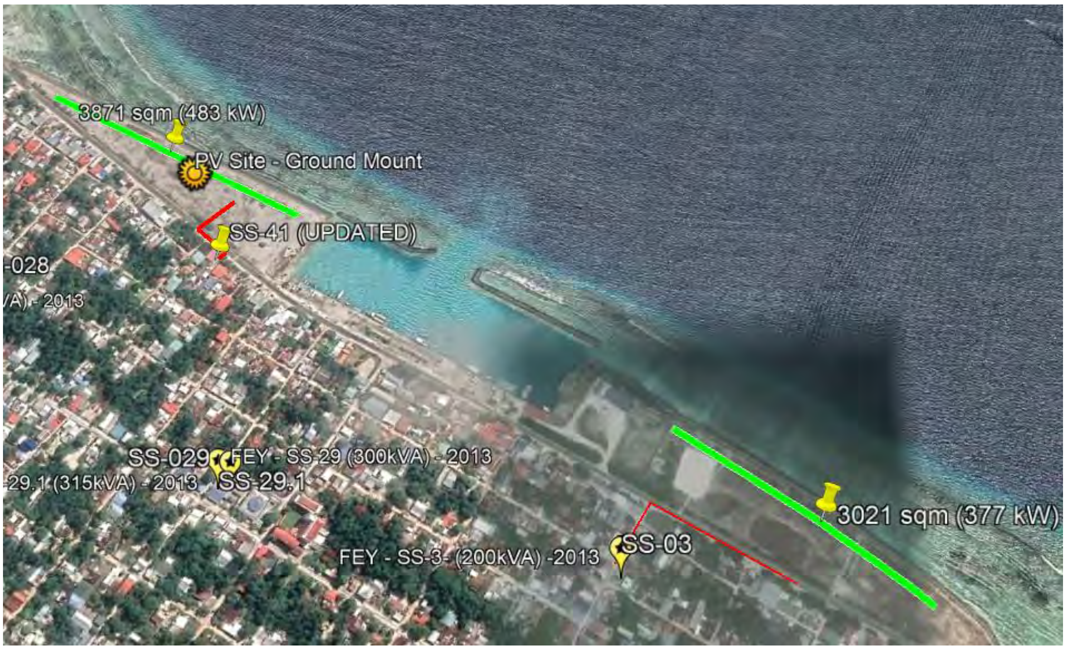
v. Interconnection related upgrades

To support the PV installations added to the addu-mainland grid specific upgrades are required at network connection points and grid connection cables will be routed from the solar PV sites to the identified connection points as detailed below. Fiber optic communication cables will also be installed along the same routes to enable communication connection to the main communication ring and allow instantaneous communication between PV plant inverters and Energy Management System in the central power house.

- 8 MW FPV at RAF (Port area lagoon)
  (11 KV power cable and FOC from solar PV site to the power house)

- ½ MW PV at Hithadhoo Harbour area
  - Removing transformer at the existing SS45
  - At the location marked below, construct new substation and relocation of transformer from existing SS 45.
  - Installation of new ring main unit and reconnect transformer to the network.
  - Installation of 11 KV power cable and FOC from solar PV site to SS 45

- 800 kW PV at Feydhoo harbor area
  - Installation of 11 KV power cable and FOC from solar PV site to SS 45



- 1/2 MW PV at Hithadhoo stadium
  - Installation of 11 KV power cable and FOC from solar PV site to SS 18

- 250 kW PV Maradhoo Feydhoo Harbour area lagoon
    - Installation of 11 KV power cable and FOC from solar PV site to SS 26 and SS27

5. Eydhafushi

i. Installation of MV transmission network

The distribution network of Eydhafushi is currently a low voltage network (400V) in which eight feeders from the power house connects the distribution boxes leading to households.

Considering the growing demand of power and also to overcome the power quality issues from increased renewable addition, the network for Eydhafushi need to be upgraded to a medium voltage (11 kV) network with installation of step up and step-down transformers along with required switch gears.

Thus, under the project two step up transformers will be installed in the power house (2x2500 KVA transformer with HV panel) from which a medium voltage ring of 3cx120 mm^2 will be run through the island connecting following substations (also marked in map)

- PH (Transformer T-1) to SS-1
- SS-1 to SS-2
- SS-2 to SS-3
- SS-3 to SS-4
- SS-4 to SS-5
- SS_5 to PH (Transformer T-2)

Also, the below LV cable connections from the transformers to upstream distribution boxes will be carried.

- SS-1 to Distribution box (A) (95sqmm cable)
- SS-1 to Distribution box (B) (95 sqmm cable)
- SS-2 to Distribution box (C) (50 sqmm cable)
- SS-2 to Distribution box (D) (95 sqmm cable)
- SS-2 to Distribution box (E) (50 sqmm cable)
- SS-2 to Distribution box (F) (50 sqmm cable)
- SS-3 to Distribution box (G) (50 sqmm cable)
- SS-3 to Distribution box (H) (50 sqmm cable)
- SS-5 to Distribution box (I) (70 sqmm cable)

Furthermore, for integrating of the PV systems installed under the ARISE, cables will be laid from PV transformers to interconnecting transformers (potentially SS-1, SS-2 and SS-4 as marked in map)

ii. Installation of new Substations

To establish the new MV network two step-up transformers (in the power house) and 5 step-down transformers will be installed (marked in map in yellow). The step-down transformers will be installed with construction of substations (transformer houses) to place transformers and related switch gear units. Locations of step-down transformers distributed throughout the island is marked in map.

iii. Communication Fibre Network

Establishing a dedicated fibre network for real time operation and monitoring of the various sub components of the hybrid grid (solar PV, BESS, Diesel generators) and all the substations forming the MV ring of the network will also be carried. The fibre network connecting the substations will follow the same route as the MV cable marked in the map (red path in the map).

6. Hinnavaru

i. Installation of MV transmission network

This subproject involves grid modernization and upgrading at Hinnavaru under component 3 of the project. The project involves the following subcomponents:

7. Upgrading MV cable network
8. Communication Fibre network
9. Installation of MV cable network and LV connection from transformers to distribution boxes

Installation of MV cable network and LV connection from transformers to distribution boxes

The distribution network of Hinnavaru is currently a low voltage network (400V) where seven feeders from the power house connects the distribution boxes leading to households.

Considering the growing demand of power and also to overcome the power quality issues from increased renewable addition, the network for Hinnavaru need to be upgraded to a medium voltage (11 kV) network with installation of step up and step-down transformers along with required switch gears.

Thus, under the project a medium voltage ring of 3cx120 mm^2 will be laid connecting following substations (also marked in map)

- PH (Transformer T-1) to SS-1
- SS-1 to SS-2
- SS-2 to SS-3
- SS-3 to SS-4
- SS-4 to SS-5
- SS_5 to PH (Transformer T-2)

Also, the below LV cable connections from the transformers to upstream distribution boxes will be carried.

- SS-1 to Distribution box A-2 (95sqmm cable)
- SS-1 to Distribution box B-2 (95 sqmm cable)
- SS-2 to Distribution box C-7 (50 sqmm cable)
- SS-2 to Distribution box D-6 (95 sqmm cable)
- SS-2 to Distribution box F-4 (50 sqmm cable)
- SS-2 to Distribution box B-5 (50 sqmm cable)
- SS-3 to Distribution box B-9 (50 sqmm cable)
- SS-3 to Distribution box A-8 (50 sqmm cable)
- SS-4 to Distribution box A-11 (95 sqmm cable)
- SS-5 to Distribution box E-6 (70 sqmm cable)
- SS-5 to Distribution box F-9 (95 sqmm cable)
- SS-5 to Distribution box G-10 (70 sqmm cable)

Furthermore, for integrating of the PV systems installed under the ARISE, cables will be laid from PV transformers to interconnecting transformers (potentially SS-3, SS-4 and PH as marked in map)

ii. Installation of new substations

To establish the new MV network two step-up transformers (in the power house) and 5 step-down transformers will be installed (marked in map in pink). The step-down transformers will be installed with construction of substations (transformer houses) to place transformers and related switch gear units. Locations of step-down transformers distributed throughout the island is marked in map.

iii.Communication Fibre Network

Establishing a dedicated fibre network for real time operation and monitoring of the various sub components of the hybrid grid (solar PV, BESS, Diesel generators) and all the substations forming the MV ring of the network will also be carried. The fibre network connecting the substations will follow the same route as the MV cable marked in the map (blue path in the map).

7. Fonadhoo

i. Installation of MV Transmission Network

Currently the distribution network for L. Fonadhoo comprise of two separate MV feeders from PH which includes:

- MV feeder 1 from PH to transformer 1
- MV feeder 2 from powerhouse to SS 3 to SS 1
- 5 LV feeders for areas closer to the power house.

Under the grid upgrades for ARISE, the MV network is to be expanded with addition of two new substations and the radial MV feeders will be formed to two separate MV rings (Figure 1). The following cable segments of size (3C x 70 sqmm 6.35/11 kV) will be installed:

MV ring 1

PH to SS 2 (Existing)

SS2 to SS4 (NEW - 0.7 km)

SS4 to PH (NEW - 0.5 km)

MV ring 2

PH to SS3 to SS1 (Existing)

SS1 to SS5 (NEW - 0.9 km)

SS5 to PH (NEW - 1.9 km)

ii. Installation of new substations

Installation of substations with transformers of 500 KVA rating, ring-main units and LV panels at locations marked below for **SS4 & SS5 (Figure 1).** In addition two step up transformers will be installed inside the powerhouse.

iii. Communication Fibre Network

Establishing a fiber optic communication network for the effective operation of the solar PV, diesel and BESS hybrid power system

In general, the communication cables will be routed along the same routes as the MV cables.

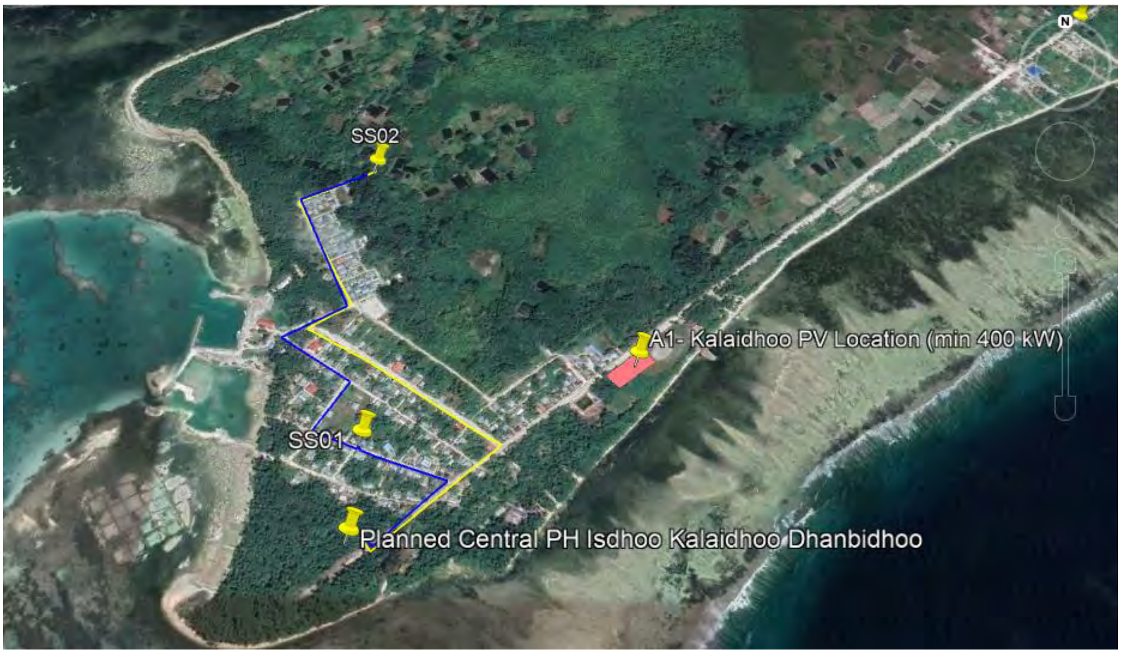
8. Isdhoo Kallaidhoo & Dhanbidhoo

i. Installation of MV Network

Installation of medium voltage ring transmission network from the central power house for Isdhoo, Kalaidhoo and Dhanbidhoo to the islands of Isdhoo and Kalaidhoo (Figure 1,2,3).

The power cable for the ring is a 3C x 70 sqmm cable. The network development for Dhanbidhoo does not fall under the scope of this project and will be implemented as a separate work by FENAKA.

Kalaidhoo part of the network	Central PH to SS- 01 to SS-02	Aprx 1.44 km
	SS-02 to CPH	Aprx 1.42 km
Isdhoo part of the network	CPH – SS03- SS04- SS05	Aprx 4.063 km
	SS05 – PH	Apprx 3.8 km
Kalaidhoo	Not under the scope of the ARISE	


SS02
A1- Kalaidhoo PV Location (min 400 kW)
SS01
Planned Central PH Isdhoo Kalaidhoo Dhanbidhoo


Harbour PV (32 kW)
Near farms (232 kW)
SS05
Near Stadium (2195sqm = 274 kW)
SS04
SS03
Planned Central PH Isdhoo Kalaidhoo Dhanbidhoo

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ii. Installation of New Substations

6 substations will be constructed for the integrated power network of Isdhoo, Kalaidhoo and Dhanbidhoo under the project. Each substation will be equipped with a 500 KVA transformer, ringmain unit and a low voltage panel. SS01, SS02 is planned for Kalaidhoo, SS03, SS04, SS05 is for Isdhoo and SS06 is for Dhanbidhoo.

iii. Coomunication Fibre Network

Establishing a fiber optic communication network for the effective operation of the solar PV, diesel and BESS hybrid power system

The fiber optic communication cables will be installed along the same trencehes through which the power cable of the MV rings are routed and the PV systems planned for the islands will be connected to the main communication ring cable.

9. Maabaidhoo

i. LV Network Upgrade

- Installation of 9 separate low voltgae feeders (400V, 3 phase) from the power house to the residential load centres. The approximate length of these distribution feeders are in below table and feeder routes originating from the power house and extending to the different parts of the islands is illustrated in Figure 1.

Feeder A	814 m
Feeder B	950 m
Feeder C	774 m
Feeder D	780 m
Feeder E	1096 m
Feeder F	630 m
Feeder G	932 m
Feeder H	577 m

- Installation of additional distribution boxes

To provide electricity access to the newly populated areas additional distribution boxes are also to be installed in the island. Thirty (24) new distribution boxes will be installed in total for the upgraded network.

ii. Communication Fibre Network

Installation of fiber optic cables from the PV installation areas to the power house as to enable timely communication, and dispatch control commands between PV inverters and energy management systems in the power house area. The communication cables will follow the same routes as the LV feeders leading to the power house from the area of the PV installation.

10. Kunahandhoo

i. Upgrading of LV network

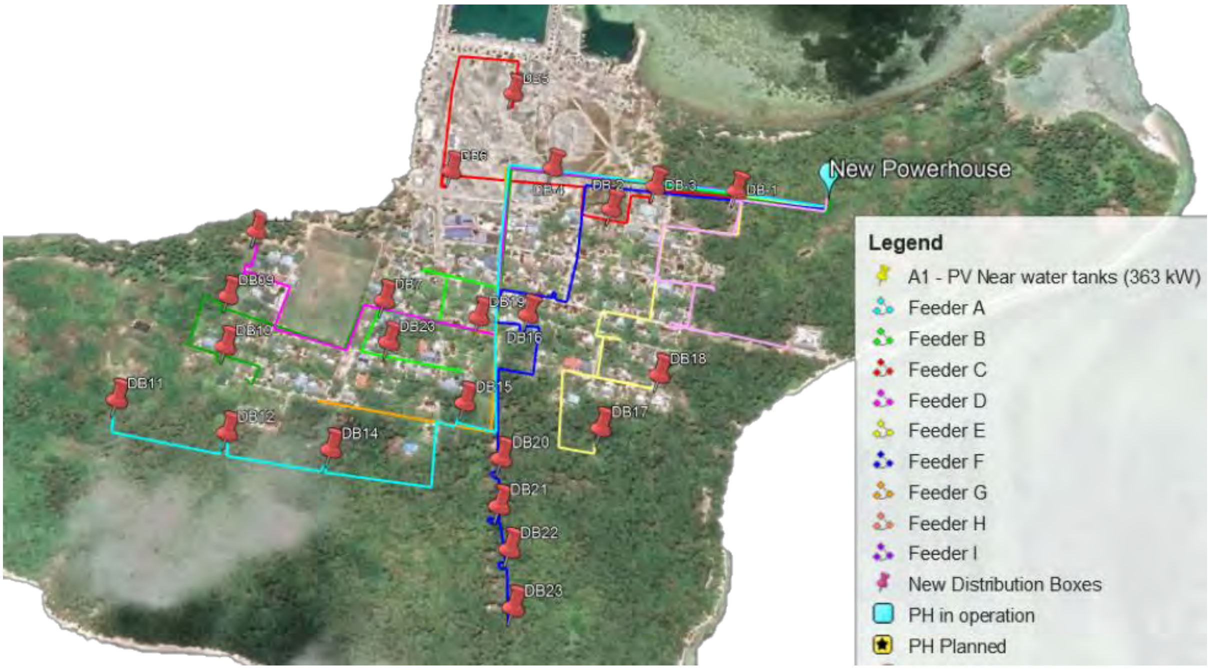
- Installation of 9 separate low voltgae feeders (400V, 3 phase) from the power house to the residential load centres

The approximate length of these distribution feeders are in below table and feeder routes originating from the power house and extending to the different parts of the islands is illustrated in Figure 1. All the existing DB’s will be disconnected from the power cables currently inuse and conencted to the newly installed feeders. The feeders and all the distribution boxes (existing and newly installed ones) along the path of each feeder is shown in Figure 2.

Feeder A	900 m
Feeder B	840 m
Feeder C	1337 m
Feeder D	1131 m
Feeder E	1127 m
Feeder F	1460 m
Feeder G	1390 m
Feeder H	1310 m
Feeder I	1415 m

- ➢ Installation of additional distribution boxes

To provide electricity access to the newly populated areas additional distribution boxes are also to be installed in the island. 23 new distribution (Figure 1) boxes will be installed and with the existing distribution boxes a total of 53 DB's will be there in the entire network.



ii. Communication Fibre network for PV sites

Installation of fiber optic cables from the PV installation areas to the power house as to enable timely communication, and dispatch control commands between PV inverters and energy management systems in the power house area. The communication cables will follow the same routes as the LV feeders leading to the power house from the area of the PV installation.

11.Hithadhoo

i. Upgrading of LV Network

Installation of 9 separate low voltgae feeders (400V, 3 phase) from the power house to the residential load centres. The approximate length of these distribution feeders are in below table and feeder routes originating from the power house and extending to the different parts of the islands is illustrated in Figure below. The feeder cables will connect to the existing distribution boxes and no new distribution boxes will be added to the network.

Feeder A	800 m
Feeder B	962 m
Feeder C	1147 m
Feeder D	1285 m
Feeder E	1185 m
Feeder F	604 m
Feeder G	987 m
Feeder H	956 m
Feeder I	956

ii. Communication Fibre network for PV sites

Installation of fibre optic cables from PV installation sites to the power house sites. The fibre communication will be routed along the same paths as the feeder line closest to the PV site.

12. Sh. Funadhoo

i. Installation of new MV network

Installation of medium voltage ring transmission network between the powerhouse and the transformers.

The power cable for the ring is approximately 3C x 70 sqmm cable.

ii. Installation of new substation

3 new substations will be constructed as part of this grid upgrading project (Figure below).

13.Kulhudhuhfushi City

i. Installation of MV network

Considering the growing demand of power and also to overcome the power quality issues from increased renewable addition, the current carrying capacity of the entire network needs to be increased. To achieve this, the cable size of the entire medium voltage ring network (over an approx length of 9.3km) is planned to be upgraded to 3Cx185 mm^2 cables. Length of cable sections forming the MV ring are given below and also marked in Figure 1.

- PH feeder 1 to SS No 1 (857m)

- SS No 1 to Port SS (410m)

- Port SS to Hospital SS (410m)

- Hospital SS to SS2 (1500m)

- SS2 to SS3 (1500 m)

- SS3 to SS4 (410m)

- SS4 to SS5 (836 m)

-SS5 to SS6 (1518 m)

- SS6 to MWSC SS (825m)

- MWSC SS to PH Feeder 2 (825m)

ii. Replacement of two existing transformers

Replacement of existing transformers SS6 and SS4.

iii. Installation of Communication Network

Communication network will go through the same route as the MV network shown in Figure.

Annex 4: Typical Schedule of Implementation per island

Activity/Month	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**	**11**	**12**
Mobilization and Temporary Site Setup	■											
Site Preparation	■											
Cable laying		■	■	■	■	■	■	■	■			
Fibre Network Installation		■	■	■	■	■	■	■	■			
Construction of Substation		■	■	■	■	■	■	■	■			
Commissioning/testing										■	■	■