APPENDICES

Appendices

Appendix 1 Member List of the Study Team

Member List of
The Project for Introduction of Clean Energy by Solar Electricity Generation System
in the Arab Republic of Egypt

Preparatory Survey 1 (Oct. 10-Oct. 24, 2009)

1.	Masakatu KOMORI	Team Leader	Senior Representative Egypt Office Japan International Cooperation Agency(JICA)
2.	Ken SAEKI	Planning Management	Grant Aid Project Management Division 3 Financing Facilitation and Procurement Supervision Department Japan International Cooperation Agency(JICA)
3.	Toshiyuki OMOTO	Procurement management Plan	Director First Construction Management Division First Management Department Japan International Cooperation System
4.	Hirotsugu KATO	Chief Consultant/ Photovoltaic System Planner	Oriental Consultants co., ltd
5.	Keiji YAMAZAKI	Interconnection/ Photovoltaic System Specialist	Oriental Consultants co., ltd
6.	Hiroshi OMURA	Equipment Specialist	Oriental Consultants co., ltd
7.	Sumio MORITA	Procurement Planning and Cost Estimation	Oriental Consultants co., ltd
8.	Yoshikazu TUKIDATE	Regulations/Environment-Social Consideration Specialist	Oriental Consultants co., ltd
9.	Masatoshi YOZA	Grid – Connected System Operating Specialist	Oriental Consultants co., ltd
10.	Masako YORITA	Architectural Planning	Oriental Consultants co., ltd
11.	Yuki KATO	Coordinator	Oriental Consultants co., ltd

Preparatory Survey 2 (Jan. 24-Feb. 21, 2010)

1.	Hirotsugu KATO	Chief Consultant/ Photovoltaic System Planner	Oriental Consultants co., ltd
2.	Keiji YAMAZAKI	Interconnection/ Photovoltaic Power System Specialist	Oriental Consultants co., ltd
3.	Hiroshi OMURA	Equipment Specialist	Oriental Consultants co., ltd
4.	Sumio MORITA	Procurement Planning and Cost Estimation	Oriental Consultants co., ltd
5.	Yoshikazu TUKIDATE	Regulations/Environment-Social Consideration Specialist	Oriental Consultants co., ltd
6.	Masatoshi YOZA	Grid – Connected System Operating Specialist	Oriental Consultants co., ltd

7.	Masako YORITA	Architectural Planning	Oriental Consultants co., ltd
8.	Yuki KATO	Coordinator	Oriental Consultants co., ltd

Preparatory Survey 3 (May. 14-May. 22, 2010)

1.	Shigeru OTAKE	Team Leader	Senior Representative Egypt Office Japan International Cooperation Agency(JICA)
2.	Hidemasa FUKUDA	Planning Management	Energy and Mining Division, Natural Resources and Energy Group, Industrial Development Department Japan International Cooperation Agency(JICA)
3.	Hirotsugu KATO	Chief Consultant/ Photovoltaic System Planner	Oriental Consultants co., ltd
4.	Keiji YAMAZAKI	Interconnection/ Photovoltaic System Specialist	Oriental Consultants co., ltd
5.	Hiroshi OMURA	Equipment Specialist	Oriental Consultants co., ltd
6.	Yuki KATO	Coordinator	Oriental Consultants co., ltd

Appendix 2 Study Schedule

Preparatory Survey 1 (Oct. 10-Oct. 24, 2009)

Date		Officials			Consultants							
		Team Leader	Planning Management	Procurement Management Plan	Chief Consultant/ Photovoltaic System Planner	Interconnected Photovoltanic System Specialist	Equipment Specialist	Procurement Planning and Cost Estimation	Regulations/ Environment-Social Consideration Specialist	Grid - Connected System Operating Specialist	Architectural Planning	Coordinator
		Masakatsu KOMORI	Ken SAEKI	Toshiyuki Omoto	Hirotsugu KATO	Keiji YAMAZAKI	Hiroshi OMURA	Sumio MORITA	Yoshikazu TSUKIDATE	Masatoshi YOZA	Masako YORITA	Yuki KATO
10-Oct	Sat	Dubai (08:50) → Cairo (10:40)			Tbilisi (04:40) → via Wien (06:20) , Wien (10:35) → Cairo (14:10)							with Cheif Consultant
11-Oct	Sun	08:30 Meeting with JICA Cairo Office, 11:00 Meeting with NREAExplanation and Discussion on Inception Report 16:30 Courtesy call to EOJ			08:30 Meeting with JICA Cairo Office, 11:00 Meeting with NREA Explanation and Discussion on Inception Report							
12-Oct	Mon	Moving to Alexandria, Field Survey at Alexandria, Meeting with E-JUST and Relevant Authorities										
13-Oct	Tue	10:00 Meeting with E-JUST and Relevant Authorities 10:30 Signing of M/M, Moving back to Cairo			10:00 Meeting with E-JUST and Relevant Authorities Moving back to Cairo							
14-Oct	Wed	Moving to Kuraymat Site, 09:00 Field Survey at Kuraymat Site Discussion with C/P about M/M						Survey for Procurement	Moving to Kuraymat Site, 09:00 Field Survey at Kuraymat Site12:00 Meeting with Relevant Authorities		Facility Planning	Ditto
15-Oct	Thu	09:00 Ministry of Higher Education, 11:00 Signing of M/M, 13:00 MOIC 14:00 Report to EOJ					Survey for Equipment	Survey for Procurement	Environment-Social Consideration Survey	Survry for Insolation	Survey for Construction/ Installation	Ditto
16-Oct	Fri	Leaving Cairo (18:30) → Dubai (00:05)			Review of Field Survey							Ditto
17-Oct	Sat	Dubai (00:05) → KIX (17:20) KIX (19:15) → HND (20:25) Arrival at Tokyo			Evaluation of candidate site and draw up discussion data							Ditto
18-Oct	Sun				Moving to Alexandria Study of justification for candidate sites							Ditto
19-Oct	Mon				Site Survey Meeting with Relevant Authorities		Site Suevey Survey for Equipment	Site Survey Survey for Procurement	Site Survey Environment-Social Consideration Survey	Site Survey System Operating Survey	Site Survey Survey for Construction/Installation	Ditto
20-Oct	Tue				09:30 Meeting with Relevant Authorities		Survey for Equipment	Survey for Procurement	Regulations Survey	Survry for Insolation	Survey for Construction/Installation	Ditto
21-Oct	Wed				09:30 Meeting with Relevant Authorities 13:30 Wrap-up meeting		Survey for Equipment Wrap-up meeting	Survey for Procurement Wrap-up meeting	Regulations Survey Wrap-up meeting	Survry for InsolationWrap-up meeting	Survey for Construction Wrap-up meeting	Ditto
22-Oct	Thu				Moving back to Cairo 15:30 Report to JICA Cairo Office		Moving back to Cairo 13:00 Meeting with Relevant Authorities	Moving back to Cairo Survey for Procurement	Moving back to Cairo Regulations Survey	Moving back to Cairo 13:00 Meeting with Relevant Authorities	Moving back to Cairo Survey for Construction	Ditto
23-Oct	Fri				Leaving Cairo (04:25) → via Frankfurt (08:45) , Frankfurt (13:55) →							Ditto
24-Oct	Sat				NRT (07:50) Arrival at Tokyo							Ditto

Preparatory Survey 2 (Jan. 24-Feb. 21, 2010)

Date		Consultants							
		Chief Consultant/ Photovoltaic System Planner	Interconnected Photovoltanic System Specialist	Equipment Specialist	Procurement Planning and Cost Estimation	Regulations/ Environment-Social Consideration Specialist	Grid – Connected System Operating Specialist	Architectural Planning	Coordinator
		Hirotsugu KATO	Keiji YAMAZAKI	Hiroshi OMURA	Sumio MORITA	Yoshikazu TSUKIDATE	Masatoshi YOZA	Masako YORITA	Yuki KATO
Jan.24	Sun	NRT (10:20) → FRA (14:05)		–	NRT (10:20) → FRA (14:05)				
Jan.25	Mon	FRA (13:25) → Cairo (18:25)		NRT (10:20) → FRA (14:05)	FRA (13:25) → Cairo (18:25)				
Jan.26	Tue	11:00 MTG with Ministry of International Cooperation 13:00 MTG with Ministry of Higher Education		FRA (13:25) → Cairo (18:25)	Survey of Procurement Equipment and Materials	12:00 MTG with Ministry of State for Environment Affairs、 15:00 MTG with Egyptian Meteorological Authority	Moving to Alexandria		with Cheif Consultant
Jan.27	Wed	11:00 MTG with Egyptian Electric Utility and Consumer Protection Regulatory Agency					Electricity and Solar Radiation Measurement	Preliminary MTG with E-JUST (Architecture)	Ditto
Jan.28	Thu	Cosideration of Photovoltaic System, Capacity & Panel Layout 15:30 MTG with JICA			Survey of Procurement Equipment and Materials	10:00 MTG with Ministry of State for Environment Affairs 13:30 Egyptian Meteorological Authority	Electricity and Solar Radiation Measurement	Preliminary MTG with E-JUST (Architecture)	Ditto
Jan.29	Fri	Moving to Alexandria					Analysis of Collected Data and Information		Ditto
Jan.30	Sat	Preparation for Kich-Off MTG							Ditto
Jan.31	Sun	Kick-Off MTG with E-JUST							Ditto
Feb.1	Mon	Site Survey							Ditto
Feb.2	Tue	MTG with relevant authority	Cosideration of Photovoltaic System, Capacity & Panel Layout		Survey of Procurement Equipment and Materials	MTG with relevant authority	Electricity and Solar Radiation Measurement	Consideration of Panel Layout Making Drawings	Ditto
Feb.3	Wed	Cosideration of Photovoltaic System, Capacity & Panel Layout			Site Survey	Social & Environmental Consideration	Electricity and Solar Radiation Measurement	Consideration on Panel Installation Making Drawings	Ditto
Feb.4	Thu	MTG with E-JUST			Construction Planning	Social & Environmental Consideration	MTG with E-JUST	MTG with E-JUST	Ditto
Feb.5	Fri	Team Meeting and Analysis of Collected Data and Information							Ditto
Feb.6	Sat	Survey on Display Installation Sites			Construction Planning	Social & Environmental Consideration	Electricity and Solar Radiation Measurement Calcuration of Generated Electricity	Alexandria (7:00)→ Cairo (9:15) Cairo (13:45)→ Istanbul (16:10) Istanbul (23:25)→	
Feb.7	Sun	Cosideration of Photovoltaic System, Capacity & Panel Layout			Construction Planning	Regulation Survey	Electricity and Solar Radiation Measurement Preparation of Equipment Specification	Tbilisi (3:40) Site Survey in Georgia, Preparation of Architectual Specification Detail Design	
Feb.8	Mon	MTG with E-JUST & Electricity Distribution Company			Construction Planning	Regulation Survey	Electricity and Solar Radiation Measurement MTG with Electricity Distribution Company	Site Survey in Georgia, Preparation of Architectual Specification	
Feb.9	Tue	MTG with E-JUST			Cost Estimation (Architecture)	Regulation Survey	MTG with E-JUST	Tbilisi (5:40)→ Istanbul(6:10) Istanbul (10:30)→ Cairo (12:45)	
Feb.10	Wed	Cosideration of Photovoltaic System Preparation of Equipment Specification			Cost Estimation (Architecture)	Regulation Survey	Consideration of Photovoltaic System Preparation of Equipment Specification	Preparation of Architectual Specification Making Layout Image	Ditto
Feb.11	Thu	Cosideration of Photovoltaic System Preparation of Equipment Specification			Cost Estimation (Architecture)	Cairo (04:25)→ FRA (07:50) FRA (13:35)→	Consideration of Photovoltaic System Preparation of Equipment Specification	Preparation of Architectual Specificatino Making Layout Image	Ditto
Feb.12	Fri	Team Meeting and Analysis of Collected Data and Information				NRT (08:35)	Team Meeting and Analysis of Collected Data and Information		Ditto
Feb.13	Sat	Cosideration of Photovoltaic System Preparation of Equipment Specification			Cost Estimation (Equipment)	–	Cosideration of Photovoltaic System Preparation of Equipment Specification	Making Survey Report, Drawings & Specification	Ditto
Feb.14	Sun	12:00 MTG with EJUST Cosideration of Photovoltaic System Preparation of Equipment Specification			MTG with EJUST Cost Estimation (Equipment)	–	MTG with EJUST Cosideration of Photovoltaic System Preparation of Equipment Specification	Making Survey Report, Drawings & Specification	Ditto
Feb.15	Mon	11:00 MTG with E-JUST & Electricity Distribution Company			Cost Estimation (Equipment)	–	MTG with E-JUST & Electricity Distribution Company	MTG with E-JUST	Ditto
Feb.16	Tue	Preparation for Wrap-Up MTG				–	Preparation for Wrap-Up MTG		
Feb.17	Wed	11:00 Wrap-Up MTG with E-JUST				–	Wrap-Up MTG with E-JUST		
Feb.18	Thu	Moving to Cairo Report to Embassy & JICA				–	Moving to Cairo Report toEmbassy & JICA		
Feb.19	Fri	Cairo (04:25)→ FRA (07:50) FRA (13:35)→		Analysis of Collected Data and Information	Cairo (04:25)→ FRA (07:50) FRA (13:35)→	–	Cairo (04:25)→ FRA (07:50) FRA (13:35)→		
Feb.20	Sat	NRT (08:35)		Cairo (04:25)→ FRA (07:50) FRA (13:35)→	NRT (08:35)	–	NRT (08:35)		
Feb.21	Sun	–	–	NRT (08:35)	–	–	–	–	–

Preparatory Survey 3 (May. 14-May. 22, 2010)

Date		Officials		Consultants			
		Team Leader	Planning Management	Chief Consultant/ Photovoltaic System Planner	Interconnected Photovoltanic System Specialist	Equipment Specialist	Coordinator
		Shigeru OTAKE	Hidemasa FUKUDA	Hirotsugu KATO	Keiji YAMAZAKI	Hiroshi OMURA	Yuki KATO
May.14	Fri		NRT(21:40)EK319 → Dubai(04:35)	NRT (20:50) QR 803/D→ Doha (05:15)			with Cheif Consultant
May.15	Sat		Dubai(08:50)EK927→ Cairo(11:40)	Doha (13:50)QR 514/B → Cairo (17:15)			Ditto
May.16	Sun	Cairo 9:00: MTG with JICA Egypt Office 13:30: Courtesy Call to Ministry of International Cooperation Japanese Embassy(TBD) Ministry of Higher Education(TBD)					Ditto
May.17	Mon		Moving to Alexandria(Borg El Arab) 13:00-15:00 at MuCSAT(E-JUST) ・To explain briefly about mission purpose and summary paper from J-side ・To share the latest situation from E-JUST side				Ditto
May.18	Tue		Alexandria(Borg El Arab) 9:00 – 14:00 at MuCSAT(E-JUST) ・To discuss technical point and M/M(Minutes and Meetings) Meeting with E-JUST				Ditto
May.19	Wed	Alexandria(Borg El Arab) 9:00 – 12:00 ・To discuss technical point and M/M(Minutes and Meetings) 13:00 – 14:00 ・To sign M/M between Prof.Khairy and JICA representative					Ditto
May.20	Thu	Moving to Cairo 14:00: Report to JICA Egypt Office and Japanese Embassy			15:00 MTG with Electricity Distribution Company Moving to Cairo		Ditto
May.21	Fri		Cairo(10:30)MS651→ Riyadh(13:10)	Cairo (19:30) QR 515/A→ Doha (22:45)			Ditto
May.22	Sat		Riyadh *Return to Japan(5/25)	Doha (01:05) QR 802/D→ NRT (19:30)			Ditto

Appendix 3 List of Parties Concerned in the Recipient Country

Preparatory Survey 1 (Oct.10-Oct.24,2009)
Preparatory Survey 2 (Jan.24-Feb.21,2010)
Preparatory Survey 3 (May.14-May.22,2010)

1. Embassy of Japan

Kaoru ISHIKAWA	Ambassador
Takeshi ITO	Counselor, Head of the Economic Cooperation Section
Yousuke ASAI	First Secretary
Naruaki HISADA	First Secretary

2. JICA Egypt Office

Nakahiro IGURO	Chief Officer
Masakatu KOMORI	Senior Representative
Shigeru OTAKE	Senior Representative
Takurou TAKEUCHI	Staff
Noriyuki TSURUOKA	Staff
Ms. Mayada Magdy Ragheb	Chief Program Officer

3. New and Renewable Energy Authority （NREA）

Mr. Fathy Ameen Mohammad	Vice Chairman for Projects & Operations
Ms. Laila Georgy Yoissef	Vice Chairman for Studies, Researchers & Technical Affairs
Mr. Hassan H. Rakha	Head Sector for Photovoltaic Dept.
Mr. Naged K. Mahmoud	Senior Planning Eng., Ex. Chairman
Mr. Salah Abou Ouf	Director of PV Dept.
Mr. Khaled Mohamed Fekry	Director of R&D Sector
Mr. Reda Abd El hgaby Ismail	Project Manager
Mr. Mohamed Delim	Project Manager

4. Egypt-Japan University of Science and Technology (E-JUST)

Mr. Ahmed B.Khairy	President
Mr. Mohamed El-Sayed Regab	Acting Chairperson
Mr. Ahmed Hamza H. Ali	Professor
Mr. Abdel-Rahman Moussa	Consultant
Mr. Ahmed Abou Esmaeel	Director Mechanics Engineering
Mr. Mohamed Assem	Architectural consultant
Mr. Haytham M. Awad	Assistant Professor
Mr. Yehia Elmahgary	Project Manager
Mrs. Nermine Nadeer	President Office Manager
Mr. M. A. M. Hanafi	Professor, University of Alexandria
Mr. Yoshihisa MATSUSHITA	Associate professor
Mr. Amr Eid	Technical Support
Mr. Heba Gamal	Technical Support
Mr. Mohamed Ibraham	Technical Support

5. E-JUST JICA

Masakatsu OKUMOTO	Project Coordinator
Manabu TSUNODA	Project Advisor
Takasei OKANO	Specialist
Mariko ADACHI	Specialist

6. Ministry of Higher Education

Mr. Mohamed. G. Abou Ali	First Under-Secretary of State
Mr. Gad El Gady	Doctor Engineering and applied Geophysics

7. Ministry of International Cooperation

Mr. Nabil Abdel-Hamid Hassan	Minister's assistant for Asian Affaire
Mrs. Samiha Barakat Farag	General Director of Japanese Dept.
Ms. Amira Medhar	Economic Researcher at Egyptian Ministry of International Cooperation

8. Egyptian Electric Utility and Consumer Protection Regulatory Agency （EEUCPRA）

Mr. Hafez E. El-Salmawy	Managing Director
Mr. Hatem Mohamed Waheed	Manager of Central Administration of Licensing and Tariff Sector

9. Alexandria Electricity Distribution Company (AEDC)

Mr. Ibrahim Madi	Chairman of Board of Directors
Mrs. Nazineh Eassa	Deputy Chairman for Technical Affairs
Mr. Mahmoud Barakat	Manager for Control Center
Mr. Galal Sayed Ahmed	Vice Chairman
Mr. Nabil Mowad Farag	
Mr. Abdul Salam Mustafa	
Mr. Hamdy Fayed	

10. Consulting Engineer for Alexandria area

Dr. Ibrahim Megahed

Appendix 4 Minutes of Discussions

Minutes of Discussions
on the Preparatory Survey
on the Project for Clean Energy Promotion Using Solar Photovoltaic System

The Government of Japan has established Cool Earth Partnership as a new financial mechanism. Through this, Government of Japan is cooperating actively with developing countries' efforts to reduce greenhouse gasses emissions, such as efforts to promote clean energy. A new scheme of grant aid, "Program Grant Aid for Environment and Climate Change", was also created by Government of Japan as a component of this financial mechanism. According to the initiative of Cool Earth Partnership, the Japan International Cooperation Agency (hereinafter referred to as "JICA"), in consultation with Government of Japan, decided to conduct a Preparatory Survey (hereinafter referred to as "the Survey") on the Project for Clean Energy Promotion Using Solar Photovoltaic System in Arab Republic of Egypt (hereinafter referred to as "the Project").

JICA sent to Arab Republic of Egypt the Preparatory Survey Team (hereinafter referred to as "the Team"), scheduled to stay in the country from 10th to 23rd October, 2009.

The Team held discussions with the concerned officials of the Government of Arab Republic of Egypt and conducted a field survey.

In the series of discussions and field survey, both sides agreed to the documents attached hereto.

Cairo, 26th October, 2009

Mr. Masakatsu Komori
Leader
Preparatory Survey Team,
Japan International Cooperation Agency,
JAPAN

Eng. Abd El Rahman Salah El Din
Executive Chairman,

New and Renewable Energy Authority,
Arab Republic of Egypt

Prof. Ahmed B. Khairy
Acting President,
Egypt-Japan University of Science and Technology (E-JUST),
Arab Republic of Egypt

Witness

Dr. Nabil Abdel-Hamid Hassan
Assistant to Minister for Asian Affairs,
Ministry of International Cooperation
Arab Republic of Egypt

ATTACHMENT

1. Current Situation

The increase demand on the energy resources compared with available traditional resources e.g., petrol, natural gas and coal, point out to a likely possibility of facing gap between consumption and production in the future. In spite of the promising discoveries of those natural resources, the energy sector in Egypt put energy use rationalizing in its first priorities along with deepening the renewable energy utilization to save the natural resources.

Currently Egyptian Government targets to satisfy 20% of the generated electricity by renewable energy by 2020, including a 12% contribution from wind energy, beside the additional contribution of other renewable energy applications, such as the solar heating systems for the households and industrial uses, water pumping applications, lighting the remote communities using photovoltaic (hereinafter referred to as "PV") systems as well as different applications of the biomass energy.

The studies show that the solar energy is available with high intensities in Egypt. Egyptian Government is keen to introduce PV power generation systems, but so far, it is not so widely spread. The Team and the Egyptian Government discussed and confirmed to formulate the Project which generates the energy by PV system and connect to national grid as one of the solutions to promote the PV system widely in the entire country.

2. Objective of the Project

The objective of the Project is to promote clean energy utilization and achieve emissions reductions by installing the photovoltaic system to be connected to the national grid.

3. Projects Requested by the Egyptian Government

3-1. The Egyptian side requested two projects of installing the on-grid photovoltaic power generating system as follows. The location of the projects is shown in Annex-1.

Table 1 Projects requested by Egyptian Government

	Project 1	Project 2
Location	Kuraymat	Egypt-Japan University of Science and Technology (E-JUST)
Outline	The power produced is used for local load at the site and excess power will be transmitted to the utility grid.	The power produced is used for the community center of the University and excess power will be transmitted to the utility grid.
Requested equipment	(1) Solar module (2) Junction box (3) Inverter (4) Distribution board (5) Cables for electric distribution	(1) Solar module (2) Junction box (3) Inverter (4) Distribution board (5) Cables for electric distribution

	(6) Battery (7) Data collecting and display device (8) Security camera system (9) Street lighting	(6) Data collecting and display device (7) Security camera system (8) Street lighting

The Team explained that the results of the survey will be reported to JICA Headquarter and the Government of Japan. The final component and the design will be determined at the 2nd phase of the Preparatory Study. The Team and the Egyptian side agreed that there is a possibility that Government of Japan cannot support both projects due to the budget allocated to the Project.

3-2. The Egyptian side explained that there is no duplication between requested contents of the Project and any other plans implemented by the other donors or the Egyptian side.

4. Responsible Organization and Implementing Agency

The responsible organization and implementing agency for Project 1 (Kuraymat) will be the New and Renewable Energy Authority (NREA). (The organization chart of NREA is shown in Annex-2.)

The responsible organization and implementing agency for Project 2 (E-JUST) will be the Egypt-Japan University of Science and Technology. (The organization chart of E-JUST is shown in Annex-3.)

5. Japan's Program Grant Aid for Environment and Climate Change

The Egyptian side understood the Japan's Program Grant Aid for Environment and Climate Change scheme explained by the Team. (as described in Annex-4, 5,6,7 and 8).

6. Schedule of the Study

6-1. The Team will proceed to further survey in Egypt until 24th of October 2009 as the 1st phase of the Preparatory Survey.

6-2. After the completion of the 1st phase of the Preparatory Survey, the Team will report the results to JICA Headquarters and Government of Japan.

6-3. If the Cabinet approve the Project based on the results of the 1st phase of the Preparatory Survey, JICA will conduct the Preparatory Survey 2 for design.

7. Other Relevant Issues

7-1 Preparation of the site

The Egyptian side agreed that the land to be installed the product shall be allocated by the responsible organization and all necessary arrangement shall be completed by the time of the 2nd Phase of the Preparatory Survey.

7-2 Procurement of Equipment

The Team explained that, in accordance with the policy of Government of Japan, products of

Japan shall be procured for major equipment in the Project. The Egyptian side understood.

7-3 Coordination with Relevant Organizations

The responsible Organization for the Project shall be the focal point for the Team, and responsible for the coordination with relevant organizations. The Egyptian side agreed to establish a consultative committee in order to coordinate with the Japanese side which consists of the Embassy of Japan, the JICA office and the procurement agency. Terms of Reference of the Consultative Committee is referred to Annex-9.

7-4 Application of the Related Laws and Regulations

The Responsible Organization for the Project shall be responsible for the application of related laws and regulations for the operation of the Grid-Connected PV system before commissioning of the Project.

7-5 Application of the JICA Environment and Social Considerations Guideline

The Team explained the outline of JICA Environmental and Social Considerations Guideline (hereinafter referred to as "the JICA Guideline") to the Egyptian side. The Egyptian side took the JICA Guideline into consideration, and shall complete the necessary procedures

7-6 Operation and Maintenance

The Responsible Organization agreed to secure and allocate the necessary budget and personnel for the operation and maintenance of grid-connected PV system procured and installed under the Project.

7-7 Customs and Tax exemption

The Egyptian side agreed that the Egyptian side shall be responsible for the exemption and/or reimbursement (payment/assumption) of all customs, tax, levies and duties incurred in Egypt for implementation of the Project.

7-8. Counter Personnel for the Project

The Egyptian side shall provide necessary numbers of counterpart personnel to the Team during the period of their studies in Egypt.

7-9 The Egyptian side shall submit all the answers to the Questionnaire which the Team handed to the Egyptian side, by 22nd October.

<List of Annex>

Annex-1 Organization Chart of NREA

Annex-2 Organization Chart of E-JUST

Annex-3 Outline of the requested Projects

Annex-4 Program Grant Aid for Environment and Climate Change

Annex-5 General Flow of Program Grant Aid for Environment and Climate Change

Annex-6 Flow of Funds for Project Implementation

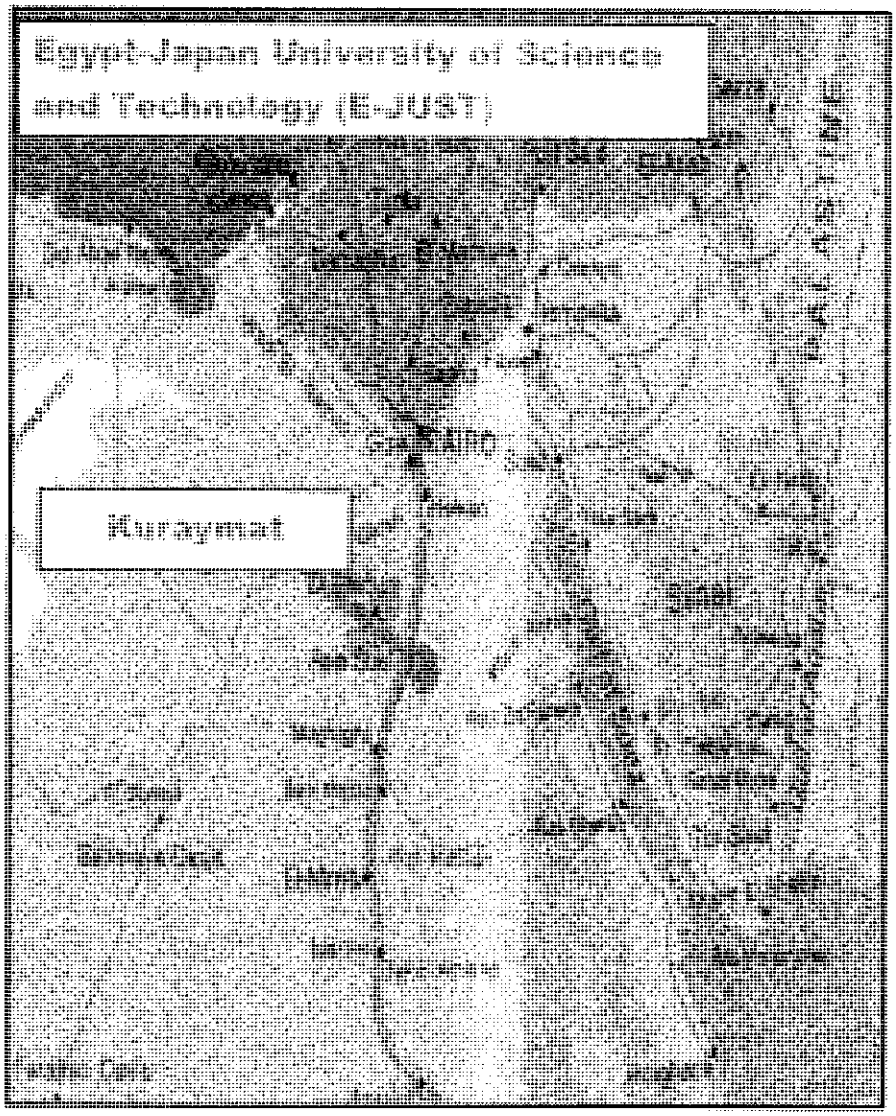
Annex-7 Project Implementation System

Annex-8 Major Undertakings to be taken by Each Government

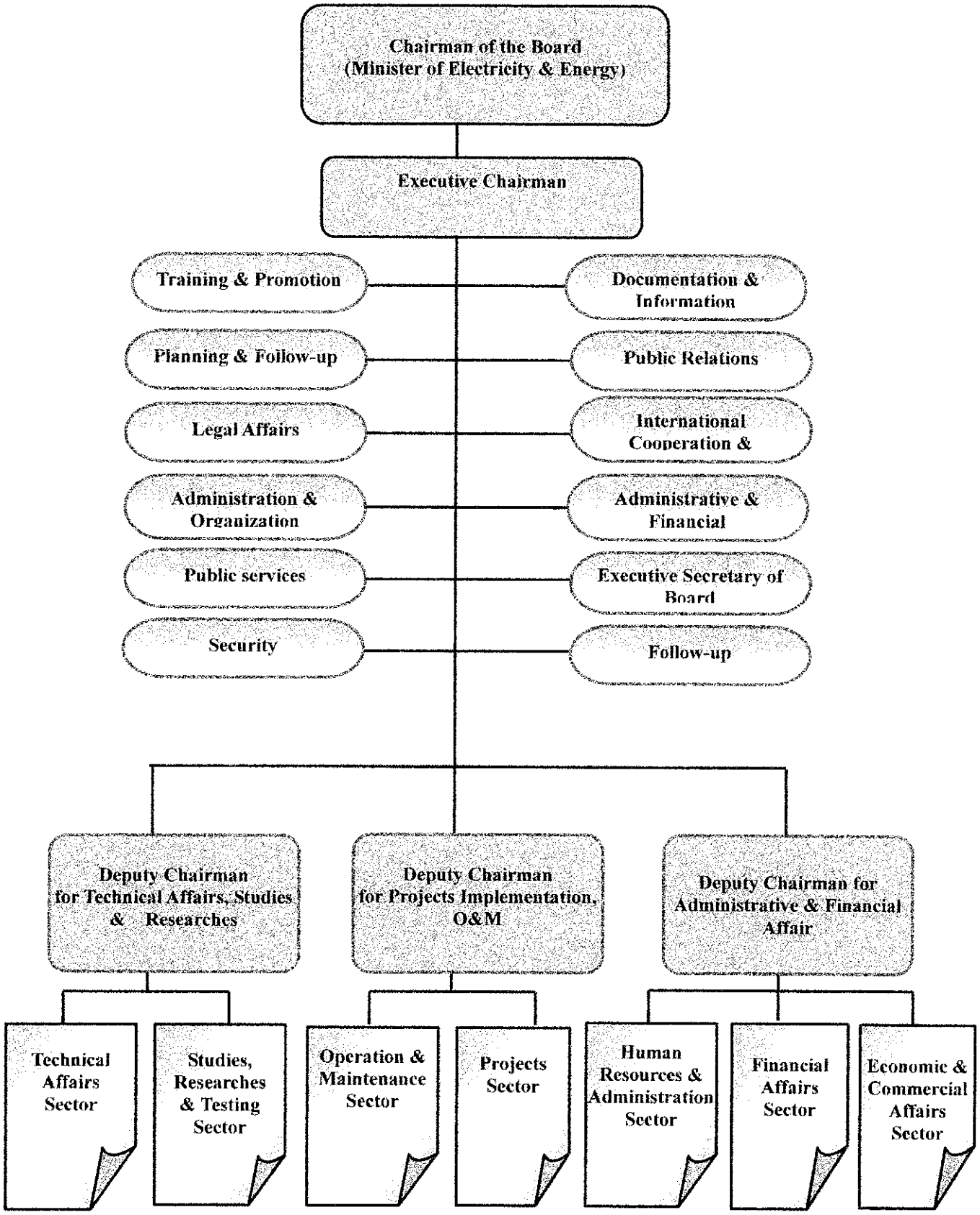
Annex-9 Terms of References of the Consultative Committee

Preparatory Survey on the Project for Clean Energy Promotion using Solar Photovoltaic System

Project Site Map



Project Site	Address
Egypt-Japan University of Science and Technology	60km west of Alexandria
Kuraymat Site	92 km south of Cairo

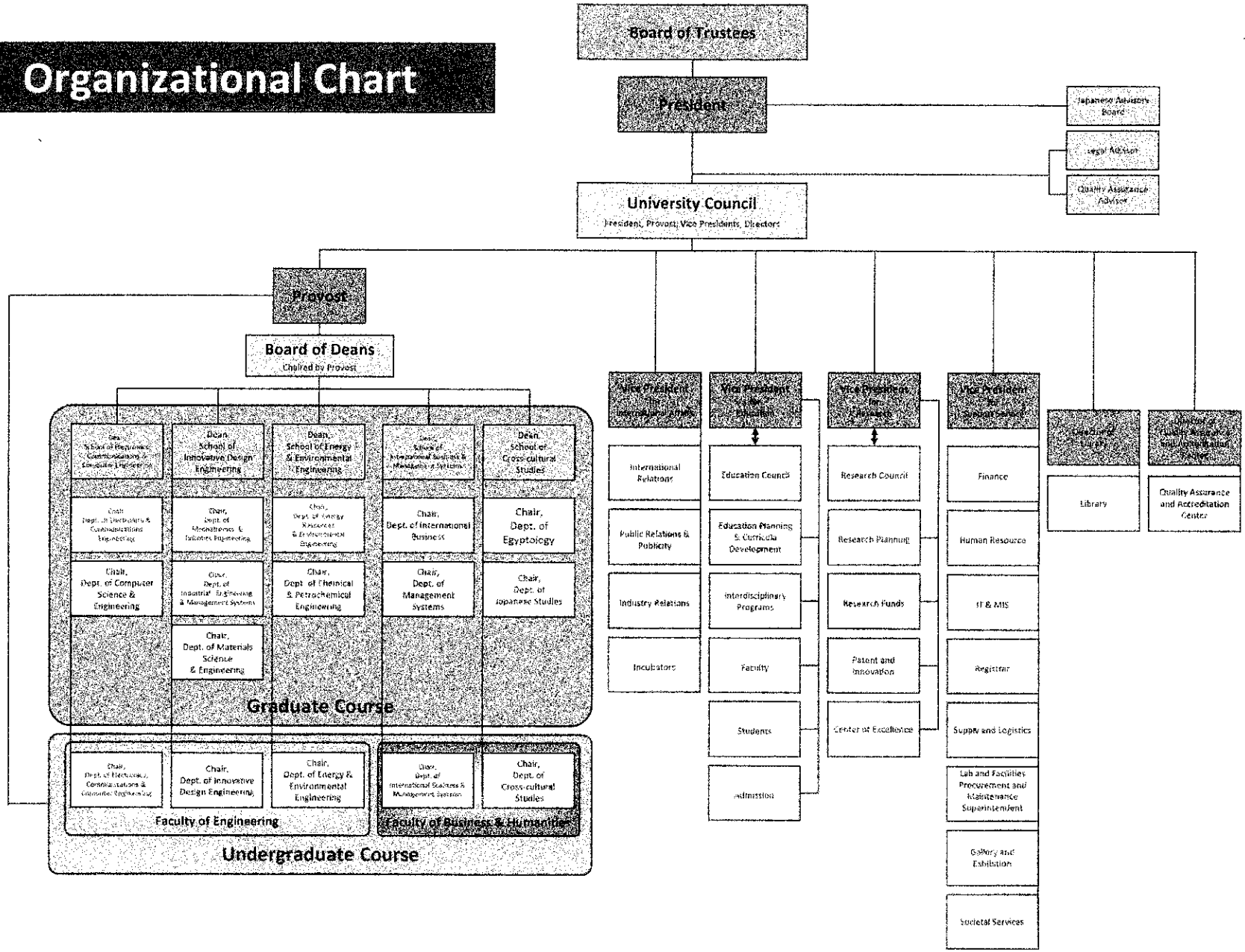


ORGANIZATIONAL CHART OF NREA

E-JUST

Annex – 3

Organizational Chart



A4-8

Program Grant Aid for Environment and Climate Change of the Government of Japan
(Provisional)

The Grant Aid provides a recipient country (hereafter referred to as "the Recipient") with non-reimbursable funds to procure the facilities, equipment, and services (engineering services and transportation of the products, etc.) for economic and social development of the country under principles in accordance with relevant laws and regulations of Japan. The Grant Aid is not supplied through the donation of materials as such.

Based on "Cool Earth Partnership" initiative of the Government of Japan, the Program Grant Aid for Environment and Climate Change (hereafter referred to as "GAEC") aims to mitigate effects of global warming by reducing GHGs emission (mitigation; e.g. improvement of energy efficiency) and to take adaptive measures (adaptation; e.g. measures against disasters related to climate change, including disaster prevention such as enhancing disaster risk management).GAEC may contain multiple components that can be combined to effectively meet these needs.

1. Procedures for GAEC

GAEC is executed through the following procedures.

Preparatory Survey 1	Preparatory Survey for project identification conducted by Japan International Cooperation Agency (JICA)
Application	Request made by a recipient country
Appraisal & Approval	Appraisal by the Government of Japan and Approval by the Cabinet
Determination of Implementation	The Notes exchanged between the Government of Japan and the Recipient Country
Grant Agreement (hereinafter referred to as the "G/A")	Agreement concluded between JICA and the Recipient
Preparatory Survey 2	Preparatory Survey for design conducted by JICA
Implementation	Procurement through the Procurement Agency by the Recipient

Firstly, if the candidate project for a GAEC is identified by the Recipient and the Government of Japan, the Government of Japan (the Ministry of Foreign Affairs) examines it whether it is eligible for GAEC. When the request is deemed appropriate, JICA, in consultation with the Government of Japan, conducts the Preparatory Survey (hereafter referred to as "the Survey") on the candidate project as Phase 1 of the Survey with Japanese consulting firms.

Secondly, the Recipient submits the official request to the Government of Japan, while the appropriateness, necessity and the basic components of the project are examined in the course of Phase 1 of the Survey,

Thirdly, the Government of Japan appraises the project to see whether it is suitable for Japan's GAEC. based on the Survey report prepared by JICA, and the results are then submitted to the Cabinet for approval.

Fourthly, the project, once approved by the Cabinet, becomes official with the Exchange of Notes (E/N) signed by the Governments of Japan and the Recipient.

Fifthly, JICA engages Grant Agreement (G/A) with the Recipient and executes the Grant by making payments of the amount agreed in the E/N and strictly monitors that the funds of the Grant are properly and effectively used.

Procurement Management Agent is designated to conduct the procurement services of products and services (including fund management, preparing tenders, contracts) for GAEC on behalf of the Recipient. The Agent is an impartial and specialized organization that will render services according to the Agent Agreement with the Recipient. The Agent is recommended to the Recipient by the Government of Japan and agreed between the two Governments in the Agreed Minutes ("A/M").

2 Preparatory Survey

1) Contents of the Survey

The purpose of the Preparatory Survey (hereafter referred to as "the Survey"), conducted by JICA on a requested project (hereafter referred to as "the Project"), is to provide the basic document necessary for the appraisal of the Project by the Government of Japan. The contents of the Survey are as follows:

- Confirmation of background, objectives, and benefits of the Project and institutional capacity of agencies and communities concerned of the Recipient necessary for project implementation.
- Evaluation of relevance of the Project to be implemented under the Grant Aid Scheme for Environment and Climate Change from a technical, social, and economic point of view.
- Confirmation of items agreed upon by both parties concerning the basic concept of the Project.
- Preparation of the design of the Project and reference document for tender.
- Estimation of cost for the Project.

The contents of the original request will be modified, as found necessary, in the design of the Project according to the guidelines of Japan's Grant Aid scheme.

The Government of Japan requests the Government of the Recipient to take whatever measures necessary to ensure its responsibility in implementing the Project. Such measures must be guaranteed even if they may fall outside the jurisdiction of the implementing organization of the Recipient. This has been confirmed by all relevant organizations of the Recipient through the Minutes of Discussions.

2) Selection of consulting firms

For the smooth implementation of the Survey, JICA will conduct the Survey with registered consulting firms. JICA selects the firms based on proposals submitted by firms with interest in implementing the Survey. The firms selected will carry out the Preparatory Survey and prepare a report, based on the terms of reference set by JICA.

3. Implementation of GAEC after the E/N

1) Exchange of Notes (E/N)

The content of GAEC will be determined in accordance with the Notes exchanged by the two

Governments concerned, in which items including, objectives of the project, period of execution, conditions and amount of the Grant Aid are confirmed.

2) Details of Procedures

Details of procedures on procurement and services under GAEC will be agreed between the authorities of the two governments concerned at the time of the signing of the G/A.

Essential points to be agreed are outlined as follows:

a) JICA will supervise the implementation of the Project.
b) Products and services will be procured and provided in accordance with JICA's "Procurement Guidelines for the Program Grant Aid for Environment and Climate Change."
c) The Recipient will conclude a contract with the Agent.
d) The Agent is the representative acting in the name of the Recipient concerning all transfers of funds to the Agent.

3) Focal points of "Procurement Guidelines for the Program Grant Aid for Environment and Climate Change"

a) The Agent

The Agent is the organization, which provides procurement of products and services on behalf of the Recipient according to the Agent Agreement with the Recipient. The Agent is recommended to the Recipient by the Government of Japan and agreed between the two Governments in the A/M.

b) Agent Agreement

The Recipient will conclude the Agent Agreement, in principle, within two months after the signing of the G/A, in accordance with the A/M. The scope of the Agent's services will be clearly specified in the Agent Agreement.

c) Approval of the Agent Agreement

The Agent Agreement is prepared as two identical documents and the copy of the Agent Agreement will be submitted to JICA by the Recipient through the Agent. JICA confirms whether the Agent Agreement is concluded in conformity with the E/N, A/M, and G/A and the Procurement Guidelines for the Program Grant Aid for Environment and Climate Change then approves the Agent Agreement.

The Agent Agreement concluded between the Recipient and the Agent will become effective after the approval by JICA in a written form.

d) Payment Methods

The Agent Agreement will stipulate that "Regarding all transfers of the fund to the Agent, the Recipient will designate the Agent to act on behalf of the Recipient and issue a Blanket Disbursement Authorization ("the BDA")to conduct the transfer of the fund (hereinafter referred to as "the Advances") to the Procurement Account from the Recipient Account.

The Agent Agreement will clearly state that the payment to the Agent will be made in Japanese yen from the Advances and that the final payment to the Agent will be made when the total remaining amount become less than three percent (3%) of the Grant and its accrued interests excluding the Agent's fees.

e) Products and Services Eligible for Procurement

Products and services to be procured will be selected from those defined in the G/A.

f) Method of Procurement

When conducting the procurement, sufficient attention will be paid to transparency in selecting the firms and for this purpose, competitive tendering will be employed in principle.

g) Tender Documents

The tender documents should contain all information necessary to enable tenderers to prepare valid offers for the products and services to be procured by GAEC.

The rights and obligations of the Recipient, the Agent and the firms supplying products and services should be stipulated in the tender documents to be prepared by the Agent. Aside from this, the tender documents will be prepared in consultation with the Recipient.

h) Pre-qualification Examination of Tenderers

The Agent may conduct a pre-qualification examination of tenderers in advance of the tender so that the invitation to the tender can be extended only to eligible firms. The pre-qualification examination should be performed only with respect to whether the prospective tenderers have the capability of concluding the contracts.

For this, the following points should be taken into consideration:

(1) Experience and past performance in contracts of similar kind
(2) Financial credibility (including assets such as real estate)
(3) Existence of offices and other items to be specified in the tender documents.
(4) Their potentialities to use necessary personnel and facilities.

i) Tender Evaluation

The tender evaluation should be implemented on the basis of the conditions specified in the tender documents.

Those tenderers which substantially conform to the technical specifications and other stipulations of the tender documents, will be judged in principle on the basis of the submitted price, and the tenderer who offers the lowest price will be designated as the successful tenderer.

The Agent will submit a detailed evaluation report of tenders to JICA for its information, while the notification of the results to the tenderers will not be premised on the confirmation by JICA.

j) Additional procurement

If there is any remaining balance after the competitive and/or selective tendering and/or direct negotiation for a contract, and if the Recipient would like to procure additional items, the Agent is allowed to conduct this additional procurement, following the points mentioned below:

(1) Procurement of same products and services
When the products and services to be additionally procured are identical with the initial tender and a competitive tendering is judged not efficient, additional procurement can be conducted by a negotiated contract with the successful tenderer of the initial tender.

(2) Other procurements
When products and services other than those mentioned above in (1) are to be procured, the procurement should be conducted through competitive tendering. In this case, the products and services for additional procurement will be selected from among those in accordance with the G/A.

l) Conclusion of the Contracts

In order to procure products and services in accordance with the guideline, the Agent will conclude contracts with firms selected by tendering or other methods.

k) Terms of Payment

The contract will clearly state the terms of payment. The Agent will make payment from the "advances," against the submission of the necessary documents from the firm on the basis of the conditions specified in the contract. When the services are the object of procurement, the Agent may pay certain portion of the contract amount in advance to the firms on the conditions that such firms submit the advance payment guarantee worth the amount of the advance payment to the Agent.

4) Undertakings required by the Government of the Recipient Country

In the implementation of the Grant Aid Project, the Recipient is required to undertake necessary measures as the following:

a) To secure land necessary for the sites of the Project and to clear, level and reclaim the land prior to commencement of the Project.
b) To provide facilities for distributing electricity, water supply and drainage and other incidental facilities in and around the sites.
c) To ensure all the expense and prompt execution for unloading, customs clearing at the port of disembarkation and domestic transportation of products purchased under the Grant Aid,
d) To ensure that customs duty, internal taxes and other fiscal levies that may be imposed in the Recipient with respect to the purchase of the Components and the Agent's services will be exempted by the Government of the Recipient.
e) To accord all the concerned parties, whose services may be required in connection with supply of the products and services under the contracts, such facilities as may be necessary for their entry into the Recipient and stay therein for the performance of their work.

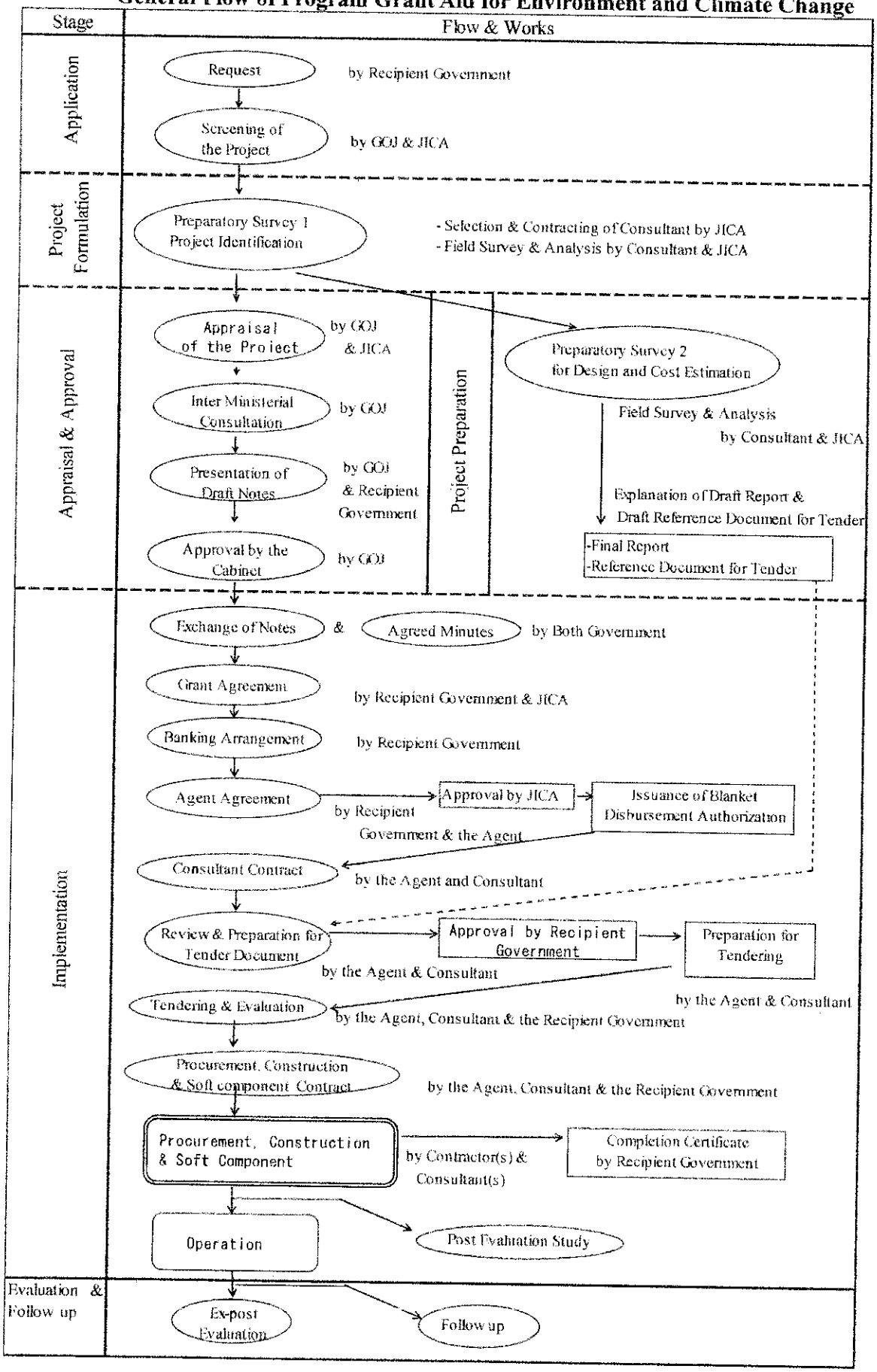
5) "Proper use of funds"

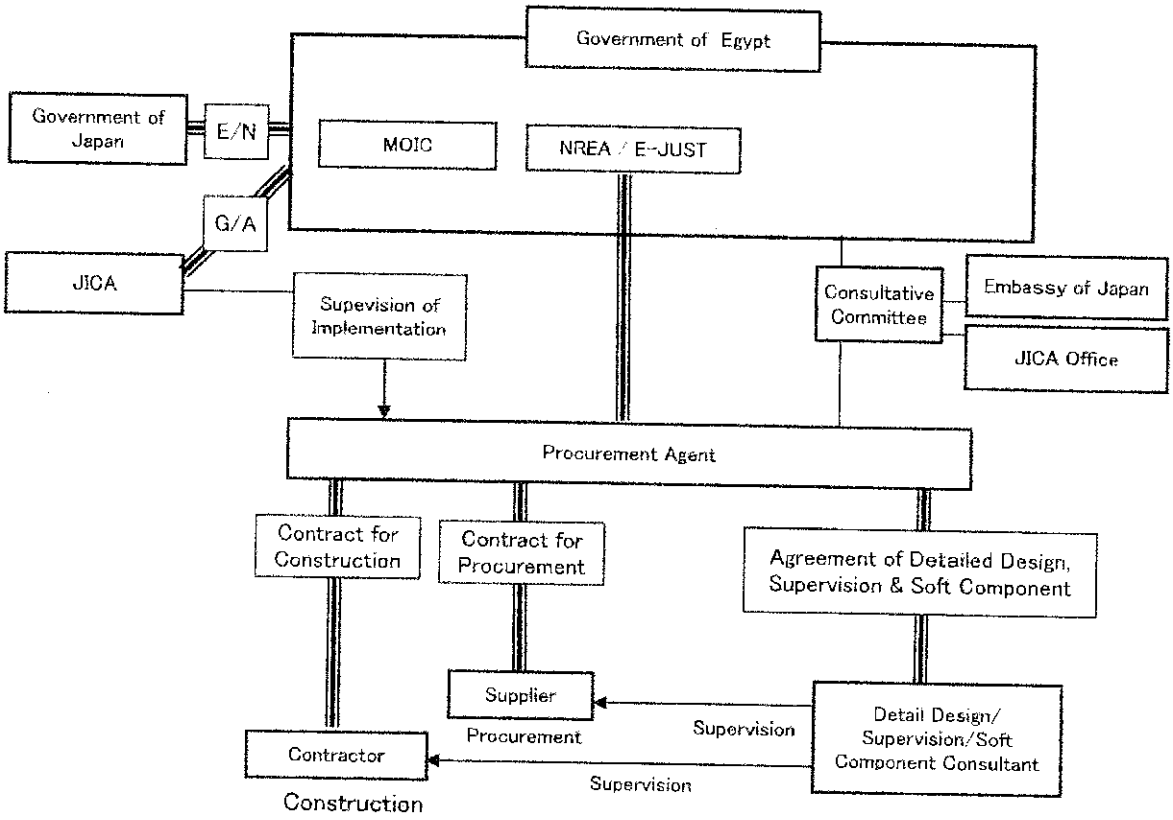
The Recipient is required to operate and maintain the facilities constructed and equipment purchased under the Grant Aid properly and effectively and to assign personnel necessary for this operation and maintenance as well as to bear all the expenses other than those covered by the Grant Aid.

6) "Export and Re-export" of products

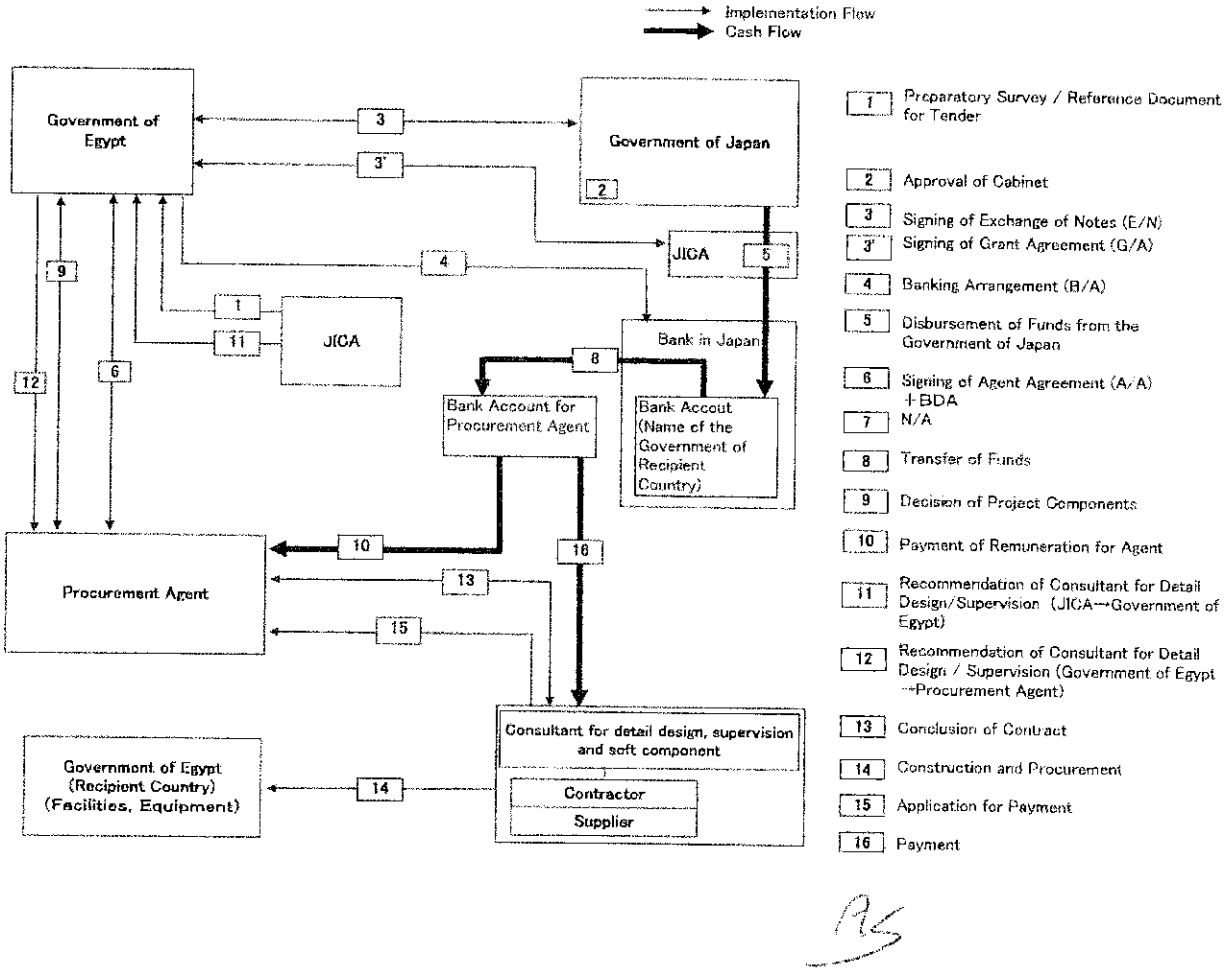
The products purchased under the Grant and its accrued interest will not be exported or re-exported from the Recipient.

General Flow of Program Grant Aid for Environment and Climate Change




Government of Egypt
Government of Japan
E/N
MOIC
NREA / E-JUST
G/A
JICA
Supevision of Implementation
Consultative Committee
Embassy of Japan
JICA Office
Procurement Agent
Contract for Construction
Contract for Procurement
Agreement of Detailed Design, Supervision & Soft Component
Supplier
Procurement
Supervision
Detail Design/ Supervision/Soft Component Consultant
Contractor
Supervision
Construction

Flow of Funds for Project Implementation



Major undertakings to be taken by each Government

No.	Items	To be covered by Grant Aid	To be covered by Recipient Side
1	To secure land		●
2	To clear, level and reclaim the site when needed urgently		●
3	To construct gates and fences in and around the site		●
4	To construct a parking lot if necessary		●
5	To construct roads		
	1) Within the site	●	
	2) Outside the site and Access road		●
6	To construct the facility and install the equipment	●	
7	To provide facilities for the distribution of electricity, water supply, drainage and other incidental facilities if necessary:		
	1)Electricity		
	a. The power distribution line to the site		●
	b. The drop wiring and internal wiring within the site	●	
	c. The main circuit breaker and transformer for the site	●	
	2) Water Supply		
	a. The city water distribution main to the site		●
	b. The supply system within the site (receiving and elevated tanks)	●	
	3) Drainage		
	a. The city drainage main (for conveying storm water, sewage, etc. from the site)		●
	b. The drainage system within the site (for sewage, ordinary waste, storm water, etc.)	●	
	4) Gas Supply		
	a. The city gas main to the site		●
	b. The gas supply system within the site	●	
	5) Telephone System		
	a. The telephone trunk line to the main distribution frame/panel (MDF) of the building		●
	b. The MDF and the extension after the frame/panel	●	
	6) Furniture and Equipment		
	a. General furniture		●
	b. Project equipment	●	
8	To bear the following commissions applied by the bank in Japan for banking services based upon the Bank Arrangement (B/A):		
	1) Payment of bank commission		●
9	To ensure all the expense and prompt execution of unloading and customs clearance at the port of disembarkation in the recipient country		
	1) Marine or air transportation of the products from Japan or third countries to the recipient	●	
	2) To ensure all the expense and prompt execution of unloading, tax exemption and customs clearance of the products at the port of disembarkation		●
	3) Internal transportation from the port of disembarkation to the project site	●	
10	To accord Japanese nationals and / or nationals of third countries, including persons employed by the agent whose services may be required in connection with the Components such facilities as may be necessary for their entry into recipient country and stay therein for the performance of their work.		●
11	To ensure that customs duties, internal taxes and other fiscal levies which may be imposed in the recipient country with respect to the purchase of the Components and to the employment of the Agent will be exempted by the Government of recipient country		●
12	To maintain and use properly and effectively the facilities that are constructed and the equipment that is provided under the Grant.		●
13	To ensure environmental and social consideration for the Programme.		●

Terms of Reference of the Consultative Committee (Provisional)

1. To confirm an implementation schedule of the Programme for the speedy and effective utilization of the Grant and its accrued interest.

2. To discuss the modifications of the Programme, including modification of the design of the facility.

3. To exchange views on allocations of the Grant and its accrued interest as well as on potential end-users.

4. To identify problems which may delay the utilization of the Grant and its accrued interest, and to explore solutions to such problems.

5. To exchange views on publicity related to the utilization of the Grant and its accrued interest.

6. To discuss any other matters that may arise from or in connection with the G/A.

Minutes of Discussions
on the Preparatory Survey
on the Project for Introduction of Clean Energy by Solar Electricity Generation System
in Arab Republic of Egypt
(Explanation on Draft Final Report)

In October 2009 and January 2010, the Japan International Cooperation Agency (hereinafter referred to as "JICA") dispatched the Preparatory Survey Teams on the Project for Clean Energy Promotion Using Solar Photovoltaic System (hereinafter referred to as "the Project") in Arab Republic of Egypt (hereinafter referred to as "Egypt"), and through discussions, field surveys and technical examination of the results of the surveys in Japan, JICA prepared a Draft Final Report of the Outline Design.

In order to explain and to consult with the concerned officials of the Government of Egypt on the component of the Draft Final Report, JICA sent to Egypt the Preparatory Survey Team for Draft Final Report Explanation (hereinafter referred to as "the Team"), which is headed by Mr. Shigeru Otake, Deputy Resident Representative in JICA Egypt Office, from May 16th to 20th, 2010.

And as a result of discussion, both sides confirmed the main items described on the attached sheets.

Cairo, June 20th, 2010

Mr. Shigeru Otake
Leader
Preparatory Survey Team
Japan International Cooperation Agency
Japan

Prof. Ahmed B. Khairy
Acting President,
Egypt-Japan University of Science and Technology (E-JUST)
Arab Republic of Egypt

Dr. Mohamed G. Abou Ali
First Under Secretary of State
Ministry of Higher Education
Arab Republic of Egypt

Witness

Mr. Nabil Abdel-Hamid Hassan
First Under Secretary of State
Ministry of International Cooperation
Arab Republic of Egypt

ATTACHMENT

1. Components of the Draft Final Report

The Egypt side agreed and accepted in principle the components of the Draft Final Report explained by the Team.

2. Program Grant Aid for Environment and Climate Change of the Government of Japan

The Egypt side understood components of the Minutes of Discussion signed by both sides on 26th October, 2009 (hereinafter referred to as "the previous M/D"), and would take the necessary measures confirmed on the previous M/D for smooth implementation of the Project following procedures of the Program Grant Aid for Environment and Climate Change of the Government of Japan as described in **Annex-4, 5, 6, 7 and 8 of the previous M/D**.

3. Schedule of the Study

JICA will complete the final report in accordance with the confirmed items and send it to Egypt-Japan university of Science and Technology (hereinafter referred to as "E-JUST") by August 2010.

4. Confirmation of progress made from the previous M/D

4.1. Project site and capacity of PV module

Both sides confirmed that project site is E-JUST Club & Mall. The Team explained that the design capacity of Photovoltaic (PV) modules to be procured and installed in E-JUST Club & Mall is 420kW based on the result of outline design and cost estimation.

4.2. Application of the Related Laws and Regulations

Based on the previous M/D, the Team reconfirmed that Egypt side has agreed to install the PV system and to have it connected to the national grid. It was also confirmed by both sides that E-JUST shall obtain the permission of the Egyptian Electric Utility and Consumer Protection Regulatory Agency for the installation and operation of the PV system to be connected to the national grid by November 2010.

5. Items of Equipment to be procured

The Team explained that the items of equipment to be procured as shown in Annex-1 based on the results of the Preparatory Surveys conducted in October 2009 and January 2010. After discussion, both sides confirmed that the major equipment such as PV modules consists of PV cells and Power Conditioners should be products of Japan. It was also confirmed by both sides that products of third country could be acceptable for other equipment as a part of components. But Egypt side requested products of Japan are preferable for all equipment to be procured and Japan side took it into consideration.

6. Soft Component

The Team explained that the following items are included in the soft component of the Project.

(1) Technical guidance on operation and maintenance of the PV system
(2) Technical guidance on operation and maintenance of the interconnection system to the grid
(3) Technical guidance on utilization of power generating and meteorological data from the PV system

7. Project Cost

The Egypt side agreed that the Project cost should not exceed the upper limit of amount agreed on in E/N and G/A. Both sides confirmed that the Project cost contains procurement cost of equipment, the cost for transportation up to the Project Site, installation cost, the Procurement Agent fee, and the consultant fee that includes the cost for soft component for the technical assistance of operation and maintenance of the equipment and PV system as a whole.

The Egypt side understood that the Project Cost Estimation attached as Annex-2 is not final and is subject to change by the result of examination through revision of the Outline Design Study.

8. Project Schedule and E-JUST CLUB & MALL Construction Schedule

Both sides confirmed tentative implementation schedule of the Project as shown in Annex-3. Both sides also confirmed that implementation schedule of the Project and E-JUST CLUB & MALL is inseparably connected. Therefore, both sides understood that both sides should implement each construction certainly and share information of each current implementation schedule continually.

9. Ownership and Responsibilities for Operation and Maintenance

The Egypt side has reconfirmed that E-JUST is the owner of the equipment for the PV system to be procured by the Project, and E-JUST is responsible for Operation and Maintenance (O&M) of the said equipment.

The Egypt side confirmed that the estimated cost for O&M described in the Draft Final Report and agreed that E-JUST will secure necessary budget and assign necessary personnel for the O&M of the PV system procured and installed under the Project.

10. Procurement Process of the Project

Both sides reconfirmed that procurement process would be supervised by the Procurement Agent (hereinafter referred to as "the Agent") in necessary consultation with the Consultative Committee (hereinafter referred to as "the Committee"). And both sides also reconfirmed roles of the Agent as follows;

(1) The Agent renders the services stipulated in the provisions of the G/A as well as the E/N for the Project;
(2) The Agent will undertake the procurement procedure necessary for the Project according to the provisions of the G/A and E/N and any other concerned guidelines;
(3) JICA will provide the Draft Final Report and Final Report to the Agent; and

(4) The Agent will commence the procurement according to the contents of the Final Report of the Outline Design.

The Team explained that if tender price exceeds the amount agreed on G/A and E/N, quantity or/and items of the equipment would be reduced until the cost for the Project comes down to the amount agreed on G/A and E/N.

The Egypt side agreed that if there is a remaining amount of the cost for the Project after tenders, additional items of equipment would be procured based on an equipment lists which will be set in the Final Report.

The Egypt side also understood that decision on addition or reduction of the equipment to be procured would be made through necessary consultation among members of the Committee.

11. The Consultative Committee

The Egypt side understood that the E-JUST chair the Committee in order to facilitate consultation and procurement process. The Terms of Reference of the Committee was settled in Annex-9 of the previous M/D.

The chair of the Committee

(1) Representative of E-JUST

The members of the Committee

(1) Representative(s) of E-JUST (including Super intendant)
(2) Representative(s) of the Ministry of Higher Education (MOHE)
(3) Representative(s) of the Ministry of International Cooperation (MOIC)
(4) Representative(s) of the Ministry of Finance (MOF)
(5) Representative(s) of Egyptian Electric Utility and Consumer Protection Regulatory Agency
(6) Representative(s) of the Alexandria Electricity Distribution Company (AEDC)
(7) Representative(s) of Embassy pf Japan
(8) Representative(s) of JICA Egypt Office

The meeting of the Committee shall be held immediately after the signing of the contract between the Agent and the consultant.

Further meetings shall be held upon request of either the Egypt side or the Japan side. The Agent may advise both sides on the necessity to call a meeting of the Committee.

12. Undertakings required by the Recipient Country

The Team requested the Egypt side to abide by the following undertakings by the Egypt side in addition to major undertakings described in the previous M/D. The Egypt side agreed to do so.

(1) Environment and Social Considerations

Both sides confirmed that the project does not require full-scale EIA. E-JUST shall be responsible for submitting the simplified EIA application Form, which is generally called "EIA Form", to the Ministry of Environmental Affairs and getting the permission by September 2010.

(2) Allocation of land/space for installation of PV system

The owner of the land where the following equipment and materials for PV system will be installed is E-JUST. The E-JUST had already agreed to offer its land for the installation of the system. It is not require any procedure in Egypt side concerning the agreement to use necessary land space within the E-JUST for the implementation of the Project.

1) for PV Modules
2) for underground cables between equipment
3) for Power Conditioner Cubicle
4) for Temporary stockyard

(3) Preparation for the Site

E-JUST should clear and level the space for PV system installation as the preparation of the site until December 2010.

(4) Construction permissions

Both sides confirmed that the E-JUST should obtain building permission of New Borg El Arab City Authority for the frame structure of the PV system by November 2010.

(5) Assignment of Counterpart Personnel

1) Overall project management

The Egypt side assigned following personnel for overall project management, coordination in each organization, and secretary of the Committee

E-JUST: Prof. Ahmed Hamza H. Ali

2) Soft Component

The Egypt side agreed to assign necessary personnel in accordance with the soft component implementation plan proposed by the Team.

The Egypt side shall inform the name of the focal Counterpart Personnel from the following organizations to JICA at the first Consultative Committee meeting.

- E-JUST: 12 person
- AEDC: 6 person

Other personnel will be assigned from each organization as required at the time of installation.

(6) Customs and Tax Exemption

Both sides confirmed that E-JUST and MOHE shall be responsible for the exemption of all customs, tax, levies and duties incurred in Egypt for implementation of the project

(7) Banking Arrangement

Both sides confirmed that the conclusion of the Banking Arrangement (B/A) is a very important factor to implement the Program smoothly and E-JUST and MOHE should be responsible for taking the necessary measures.

13. Confidentiality of the Project

Both sides confirmed that all the information related to the Project shall not be released to any outside parties before conclusion of all the contract(s) for the Project because they are confidential document that contains information related to the tender.

Such information includes the followings:

a) detailed drawings, specifications, and other technical information of the facilities and equipment;

b) cost estimation;

c) the Draft Final Report;

d) the Final Report

<List of Annex>

Annex-1 List of Equipment

Annex-2 Project Cost Estimation (Confidential)

Annex-3 Implementation Schedule for the Project and E-JUST CLUB & MALL

List of Major Equipment

Equipment		Quantity
Grid-connected Photovoltaic System		1 system
	1-1. Photovoltaic (PV) Module	420 kW
	1-2. Supporting structure for PV modules	1 set
	1-3. Power Conditioners	1 set
	1-4. Connecting box	1 set
	1-5. Power collecting box	1 set
	1-6. PV system connection board	1 set
	1-7. Data management and monitoring system	1 set
	1-8. Meteorological observation instruments	1 set
	1-9.Large display	1 set
	1-10.Sign board	1 set
	1-11 PV information system	1 set
	1-12 Maintenance equipment	1 set

Project Cost Estimation (Confidential)

This cost estimate is provisional and would be further examined by the Government of Japan for the approval of the Grant Aid.

1. Cost to be borne by the Japanese side: approximately ¥ million

Item	Amount (Million Japanese Yen)
1. Procurement cost of equipment and materials	
2. Procurement Agent & Consulting Services Fee	
3. Total (1+2)	

2. Cost to be borne by the Egypt side: approximately Egyptian Pounds

Item	Amount (Egyptian Pounds)
1. Installation of the substation and medium voltage lead-in cables for 11kV	855,000
2. Water pipe work	4,910
3. Installation of security camera	120,000
4. Installation of fence	18,446
5. Site preparation	198,380
6. Payment of commission to Japanese bank	57,800
7. Total (I.)	1,254,536

3. Cost to be borne by the Egypt side for Operation and Maintenance (every year)
(1) Electricity cost for the data management and monitoring system, the large display, etc.
Approximately 57,400 (Egyptian Pounds)
(2) Labor cost for cleaning of the PV modules
Approximately 4,900 (Egyptian Pounds)
(3) Personnel expense for operation and maintenance staff for the PV system
Approximately 72,000 (Egyptian Pounds)
(4) Water charge for cleaning of the PV modules
Approximately 1,600 (Egyptian Pounds)
(5) The Internet connection cost
Approximately 3,270 (Egyptian Pounds)
(6) Consumable materials cost
Approximately 8,030 (Egyptian Pounds)
(7) Total Approximately 147,200 (Egyptian Pounds)

The equipment to be procured in the Project can be operated and maintained by the maintenance staff of the facilities (E-JUST). The O&M work will take up a little time of the staff on daily basis, which is evaluated in money term.

At intervals the equipment will require replacement of worn out parts and consumables. In the short run, most of parts and consumables to be needed will be covered by those provided in the Project, only minor, locally available items have to be purchased by Egypt side. After the provisions of the Project have run out, necessary items that have to be purchased by Egypt side will increase.

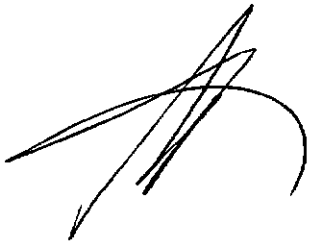
4. Conditions for estimation

(1) Time of estimation: February 2010

(2) Foreign exchange rate: US$ 1.00 = JP¥ 92.15
Egyptian pounds 1.00 = JP¥ 16.78

(3) Others:

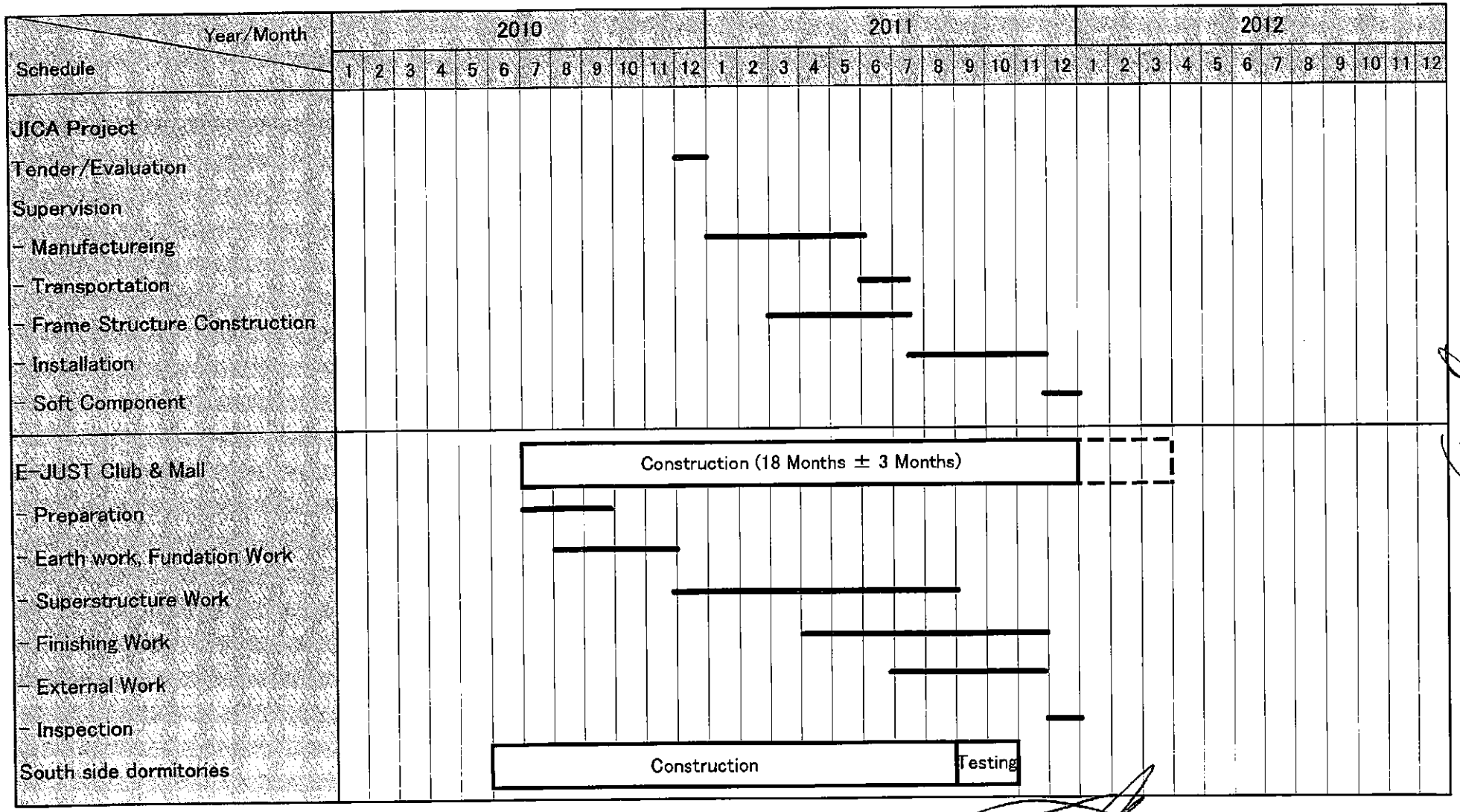
The above estimation was carried out in accordance with relevant rules and the guideline of Japan's Grant Aid.



Annex-3

Implementation Schedule for the Project and E-JUST CLUB & MALL

19, May, 2010



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Appendix 5 Soft Component (Technical Assistance) Plan

JAPAN INTERNATIONAL COOPERATION AGENCY

THE PROJECT FOR INTRODUCTION OF CLEAN ENERGY BY SOLAR ELECTRICITY GENERATION SYSTEM IN ARAB REPUBLIC OF EGYPT

SOFT COMPONENT (TECHNICAL ASSISTANCE) PLAN

OCTOBER 2010

ORIENTAL CONSULTANTS CO.,LTD.

Table of Contents

1 Background of Implementing Soft Component

1-1 Project Background

Arab Republic of Egypt (hereinafter referred to as "Egypt"), as one of the Non-Annex I countries of the Kyoto Protocol, ratified the United Nations Framework Convention on Climate Change (UNFCCC) and set its strategic target to increase the percentage of renewable energy using solar and wind power to 20% of the total electric generating capacity by 2020, in accordance with the greenhouse gasses emissions reduction policy.

The export of oil and natural gas has an important role in foreign currency revenue of Egypt, however, according to an estimate, domestic oil and natural gas will be depleted by 2020 due to increased electricity demand by rapid economic development. The Egyptian Electrical Holding Company (hereinafter referred to as "EEHC") formulated the 6th Five-year plan (2007～2012) to meet its high electricity demand which increases by 6.35% annually. According to the estimation of this plan, additional electricity generating capacity of 7,750MW using combined cycle gas turbines (CCGT), amounting to 37% of the total power generating capacity of 2012, will be required. Under these circumstances, Egypt has started focusing more on utilizing renewable energies such as hydro, wind, photovoltaic, geothermal and biomass power generation.

As for countermeasures for climate change, the New and Renewable Energy Authority (hereinafter referred to as "NREA") was set up to drive forward renewable energy under the umbrella of the Ministry of Electricity and Energy in 1986, promoting changeover of energy sources from oil to more clean energies. In the Five-year plan (2007～2012), 1,490MW, about 5% of total capacity of the newly constructed power generating plants by 2010 is planned to be covered by renewable energy. It was also adopted in the Supreme Council of Energy in 2008 that renewable energy would be increased up to 20% of total domestic electricity demand by 2020.

This project aims at contributing to expedite introduction of grid-connected solar photovoltaic (PV) system and reduce greenhouse gasses emissions in Egypt blessed with the energy of sunlight.

To achieve above said objectives, introduction of grid-connected solar PV system equipment and technical assistance for operation and maintenance called "Soft Component" are programmed for E-JUST (Egypt – Japan University of Science and Technology) located in Borg El Arab city. The responsible organization and implementing agency of the Project are to be both E-JUST, and the introducing grid-connected solar PV system is planned to connect to the grid of existing electrical power system, it is essentially required to cooperate with AEDC (Alexandria Electricity Distribution Company) which is the power supply company for E-JUST in Alexandria area.

1-2 Necessity of implementing the Soft Component

E-JUST will operate and maintain the grid-connected solar photovoltaic system (here in after referred to as "PV system") in the first time after introduction of the system under this Project. Therefore, it is unavoidably necessary for operation and management staff to master the basic principles, operation procedures of the PV system and troubleshooting method whenever fault of the system is detected. Furthermore, it is necessary to formulate the work flow consisting of collection, compilation, analysis and recording with respect to power generating and meteorological data.

It is indispensable to communicate, collaborate and cooperate with Alexandria Electricity Distribution Company (AEDC) in order to ensure secure, stable and safe operation of the PV system which is connected to the grid owned by AEDC.

AEDC has been supplying power to Alexandria area and owns enough knowledge and technical understanding in power distribution, operation and maintenance. Meanwhile, since AECD has been inexperienced to the connection with a PV system, this technical assistance for AEDC is required to cover guidance for connecting to the PV system of this project.

Accordingly, the JICA study team proposed implementation of a soft component for E-JUST and AEDC, aiming at smooth and sustainable operation of the PV system.

Table 1 Outline of the Project

Equipment procurement for PV system		
Grid-connected solar PV system	Usage of power	Needs
	Power generated by PV system connecting to the existing grid is supplied to facilities of E-JUST	To increase the percentage of renewable energy such as solar and wind power up to 20% of the total electric power generating capacity by 2020, in accordance with the greenhouse gasses emissions reduction policy
Technical Assistance for grid-connected PV system (Soft Component)		
Technical assistance	Content of training	Needs
	Training on basic knowledge of PV system and on the operation and maintenance thereof including inspection and troubleshooting.	To address insufficient knowledge for operation and management of PV system, because it has hardly been introduced in Egypt up to now.

Table 2 Outline of E-JUST CLUB & MALL

Project Site：E-JUST CLUB & MALL Compound (60km to the west of Alexandria)	
Implementing agency	E-JUST
Location	E-JUST CLUB & MALL, New Borg EL Arab city, Alexandria, Arab Republic of Egypt
Owner of the land	E-JUST
Licensing	E-JUST
Power generating capacity	Approximately420kW
Estimated amount of annual power generated by the PV system	Approximately641,000kWh
Area of installation	Approximately7,000m^2
Usage of power	Power supply for the sport club, the shopping mall, and the dormitories

1-3 Organization for Operation and Maintenance

E-JUST:

Department of Energy and Environmental Engineering will be in charge of operation and maintenance of the PV system of this project. The main technical staff group for the operation and maintenance consists of 4 technical staff (automatic control engineer, communication engineer, chemical engineer and civil engineer). Another 8 technical staff and 4 security staff in addition to the main technical staff group denoted above will be involved in operation and maintenance

AEDC:

The PV system of this project will be connected to the grid of ADEC which is the responsible electricity distribution company in Alexandria and vicinity area. Therefore, 6 technical staff from AEDC, who is in charge of operation and maintenance of the area including E-JUST CLUB & MALL, will be engaged in the O&M work of grid-connection part of the PV system to be introduced under this Project.

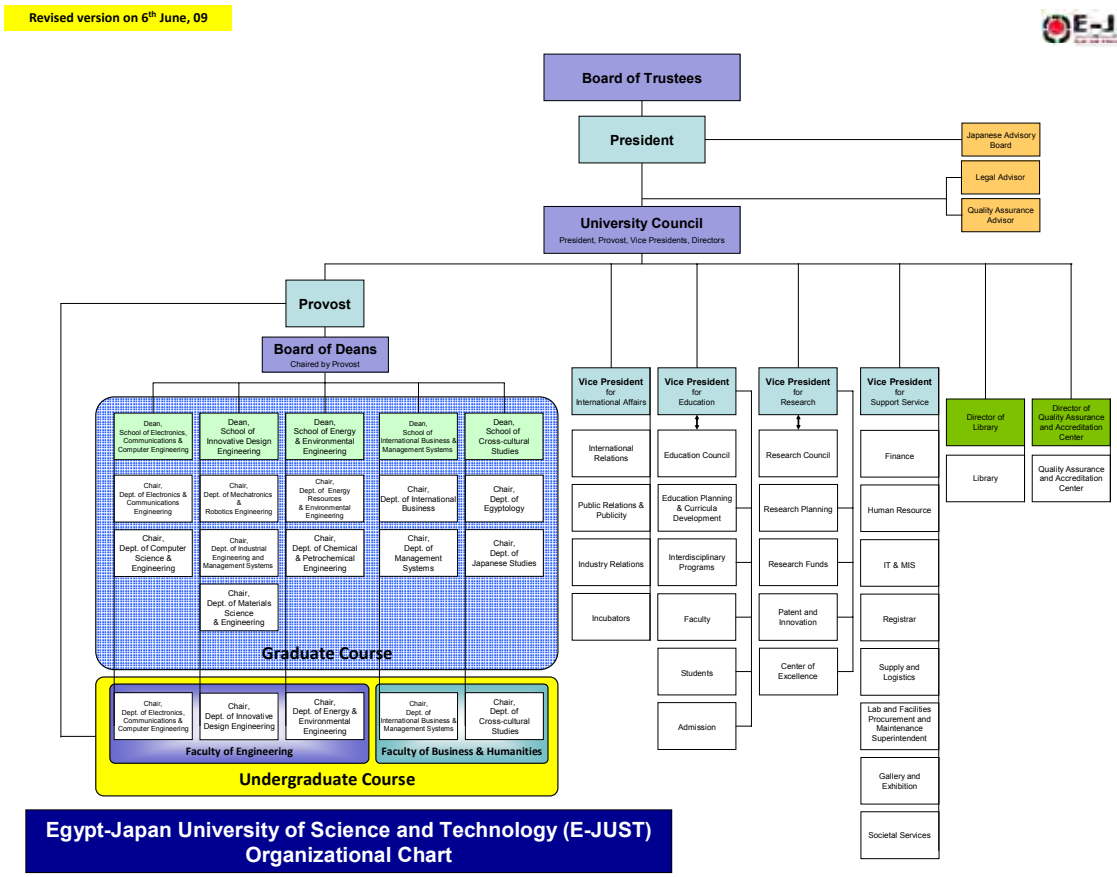

Figure 1 E-JUST Organization Structure

2 Objectives of the Soft Component

Objectives of the soft component are set as follows to ensure smooth start-up and sustainability of the system to be introduced;

1. The trainees obtain the ability to appropriately operate and maintain the PV system
2. The trainees obtain the ability to appropriately operate and maintain the interconnection system to the grid
3. The trainees obtain the ability to appropriately utilize the power generating and meteorological data through the process of compilation, edition, processing, and other necessary arrangement.

3 Outcomes of the Soft Component

Outcomes which are needed to be accomplished at the end of the soft component program are set as follows;

1. Trainees understand operation and maintenance method of the PV system including preventive maintenance and troubleshooting method
2. Trainees understand operation and maintenance method of the interconnection system to the grid including setting up method, preventive maintenance and troubleshooting method
3. Trainees understand operation and maintenance method of equipment concerning power generating and meteorological observation including preventive maintenance and troubleshooting, and also understand data arrangement, edition, processing, utilization method and meaning of utilization of data

4 Verification of the Degree of Attainment

Well designed interactive training approach will be programmed for helping participants take their motivation on the soft component program. Program consists of practical session utilizing equipment which will be newly introduced by this project as well as lecture session. Basically participants will be supposed to be checked their knowledge and understanding level of the contents of the soft component timely by examination and so on.

The verify method of the degree of attainment are expressed in the following table.

Table 3 Outcomes and verify methods of the degree of attainment

Outcome	Verification method	Confirmation criteria
1. Trainees understand operation and maintenance method of the PV system including preventive maintenance and troubleshooting method	1-1 By final paper and practice exams on the items concerning operation and maintenance of PV system. In these exams, items such as names and role of each equipment, troubleshooting method, equipment checking method, cleaning and so on are included. 1-2 By preparation of forms of daily /monthly check sheet of PV system, record of trouble and troubleshooting which will be made by the trainees	1-1 Confirming 80% right answer ratio or more for the final paper and practice exam. 1-2 Confirming completion of check sheet, fault record and troubleshooting forms.
2. Trainees understand operation and maintenance method of the interconnection system to the grid including setting up method, preventive maintenance and troubleshooting method	2-1 By final paper exams on the items concerning interconnection system to the grid (names and roles of each equipment, troubleshooting method, equipment checking method and so on) 2-2 By final paper and practice exams on the items concerning the setup of reverse power flow 2-3 By preparation of forms of daily /monthly check sheet of PV system, record of trouble and troubleshooting which will be made by the trainees	2-1 Confirming 80% right answer ratio or more for the final paper and practice exam 2-2 Confirming 80% right answer ratio or more for the final paper and practice exam 2-3 Confirming completion of check sheet, fault record and troubleshooting forms.
3. Trainees understand operation and maintenance method of equipment concerning power generating and meteorological observation including preventive maintenance and troubleshooting, and also understand data arrangement, edition, processing, utilization method and meaning of utilization of data	3-1 By final paper exams on the items concerning operation and maintenance of power generating and meteorological observation equipment (names and roles of each equipment, troubleshooting method, equipment checking method and so on) 3-2 By preparation of forms of daily /monthly check sheet of PV system, record of trouble and troubleshooting which will be made by the trainees 3-3 By preparation of form of financial statement of operation and maintenance activity which will be made by the trainees 3-4 By preparation of presentation materials for a public relations using which will be made by the trainees. Data such as decrease in CO_2 emission, power generating and meteorological data are supposed to be expressed in these presentation materials.	3-1 Confirming 80% right answer ratio or more for the final paper and practice exam 3-2 Confirming completion of check sheet, fault record and troubleshooting forms. 3-3 Confirming completion of financial statement form 3-4 Confirming completion of presentation material

5 Activities of the Soft Component

5-1 Activity

The activity steps which are needed to attain above said outcomes are denoted as follows.

【Outcome 1：Trainees understand operation and maintenance method of the PV system including preventive maintenance and troubleshooting method】

This program consists of lecture session using texts on PV system and its component, work flow materials and manuals, and practical session utilizing the PV system which will be newly introduced by this project.

<Contents>

a) Technical guidance on basic theory and structure of the PV system
b) Technical guidance on the function and features of the main equipment (the PV modules, connection boxes, the power conditioners and so on)
c) Technical guidance on troubleshooting of the PV system targeting rapid and proper response to the faults. Explanation of sample failure due to improper operation and its preventive countermeasure is also included.
d) Technical guidance on technology, skill and planning of daily and periodic inspection for the PV system
e) Technical guidance on various checks such as earth resistance and insulation resistance measurements for the PV system
f) Technical guidance on planning replacement of equipment and dispatching procedure of manufacturer's engineer when it is required such as repair work for the PV system
g) Technical guidance on financial plans for the operation and maintenance for the PV system

【Outcome 2: Trainees understand operation and maintenance method of the interconnection system to the grid including setting up method, preventive maintenance and troubleshooting method】

This program mainly deals with the function and features of the main equipment needed for interconnection to the grid. This program consists of lecture session using materials on troubleshooting of connection side in case of system trouble and work flow materials, and practical session utilizing electrical substation and the PV system which will be newly introduced by this project.

<Contents>

a) Technical guidance on equipment components of the substation which is the connection point to the grid
b) Technical guidance on the functions and features of the circuit breakers, protection equipment, transformers, and measurement equipment
c) Technical guidance on troubleshooting of the interconnection system to the grid targeting rapid and proper response to the faults
d) Technical guidance on technology, skill and planning of daily and periodic inspection of the interconnection system to the grid

e) Technical guidance on various checks such as earth resistance and insulation resistance measurements for the interconnection system to the grid
f) Technical guidance on setting and operation for reverse power flow
g) Technical guidance on planning replacement of equipment and dispatching procedure of manufacturer's engineer when it is required such as repair work for the interconnection system

【Outcome 3: Trainees understand operation and maintenance method of equipment concerning power generating and meteorological observation including preventive maintenance and troubleshooting, and also understand data arrangement, edition, processing, utilization method and meaning of utilization of data】

This program mainly deals with the function and features of the main equipment needed for data management and monitoring systems. This program consists of lecture session using manuals and work flow materials on data processing, analytic method and data transmission to the large display, and practical session utilizing data management and monitoring equipment, PV information system and large display which will be newly introduced by this project.

<Contents>

a) Technical guidance on configuration of measurement equipment of the PV system
b) Technical guidance on equipment configuration and function of the PV Information system
c) Technical guidance on configuration, function and features of the meteorological observation equipment
d) Technical guidance on data collecting and handling methods such as compiling database in relation to power generating and meteorological data
e) Technical guidance on analysis and evaluation skill of power generating and meteorological data and its operation such as budgetary planning of power purchase.
f) Technical guidance on promotion of public relations activity utilizing various data including chart which is processed and transmitted to the large display
g) Technical guidance on planning replacement of equipment and dispatching procedure of manufacturer's engineer when it is required such as repair work for PV Information system

5-2 Deliverable by Egyptian side

Deliverables by Egyptian side are following documents which the trainees should finalize within this soft component.

- Manual on PV system operation and maintenance
- Manual on data arrangement, processing and utilization
- Manual on troubleshooting
- Daily/periodic inspection form
- Daily/monthly check sheet
- Financial statements on operation and maintenance related to the PV system

5-3 Resource for the soft component implementation

Resource for the soft component implementation is planned in the following table. The trainees (target group) consist of implementing agency of E-JUST and AEDC

Table 4 Resource for the soft component implementation

Egyptian side	Japanese side
Trainee (Target group): E-JUST staff 12 persons ADEC staff 6 persons Place: E-JUST staff: E-JUST AEDC staff: AEDC	Experts: PV system operation and maintenance 1.5MM Interconnection 1.5MM Data management and PV information system 1.5MM Training period: 30 days

It is planned to have 3 experts of PV system operation and maintenance, interconnection, and data management and PV information system are planned. Each expert deals with items needed for attainment of each outcome, that is, the expert of PV system operation and maintenance for outcome 1, Interconnection for outcome 2, Data management and PV information system for outcome 3 in Table 3.

Manuals on PV system operation and maintenance, power generating and meteorological data, data management and others, and work flow materials will be used for the soft component. PV system, data management and monitoring system and PV information system will be used during the practice session. Operation and maintenance method of each system and troubleshooting method will be also covered during the guidance. Since it is needed to cover above said specialties, experts should be selected from experienced PV system makers which own knowledge in these fields.

6 Resource procurement plan

6-1 Dispatch of Japanese consultants

Since Egypt is inexperienced to introducing exceeding 400kW PV capacity system, it's recommended to utilize international resource for guidance of this program instead of outsourcing to local resource. In this report, it is assumed to have Japanese consultants for guidance of this program.

In addition, since the staff of target group doesn't have enough command of English for lecture in English as a result of site surveys, it is planned to have interpreter(s) during the consultant's guidance.

6-2 Selection of expert

Since it's needed to cover these specialties, experts should be selected from PV system makers which experienced similar projects in the past and own knowledge in these fields. Eexperts will be selected by the technical proposal and interview. Technical performance will be taken into account at the selection and related cost must be covered by financial budget under this Project.

7 Implementation Schedule of the soft component

Schedule of the soft component is expressed in the following chart

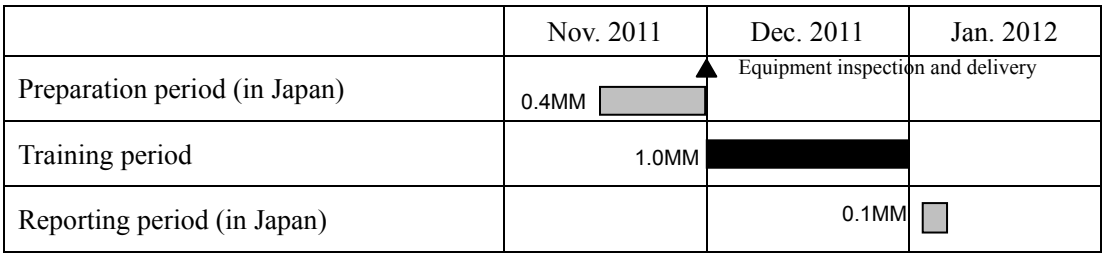

Figure 2 Implementation schedule

8 Deliverable of the soft component

Deliverables of the soft component are shown below. The total soft component period is estimated to be 1.5 months consisting of 0.5 months of preparation period in Japan and 1.0 months of training period in Egypt. Since the soft component implementation is deemed short period due to the one month training period in Egypt, the documents to be submitted are final report to the implementing agency and soft component completion report in Japanese version attached with above final report to JICA.

Table 5 Deliverable list

1. Final Report (written in English, to the implementing agency)
   - ① Plan and Implementation of Activities
   - ② Plan and Accomplishment of Outputs
   - ③ Factors that have affected Accomplishment of Outputs
   - ④ Problems on Development and Recommendations for Sustainability of Outputs
   - ⑤ Items of documents so on. as the part of Outputs
2. Completion report (written in Japanese, to JICA, according to the guideline of soft component completion report)
   - ① Summary of the project (Name of the project, E/N execution date, E/N budget and agreement price of consultant's service)
   - ② Summary of the soft component (cost, background, objectives, outcomes, planned activity, experts, trainees, training period (schedule and M/M), actual activity achievement and degree of attainment)
   - ③ Necessary improvement and recommendation to achieve objectives and sustain the project
   - ④ Attached documents(soft component schedule, CV of experts, trainee list, attendance sheet and deliverable list)
   - ⑤ Other materials (final report (completion report to the implementing agency, manuals made within the soft component program, textbooks, and results of exams etc.) and others (video, pictures and newspapers etc.))

9 Responsibility of the implementing agency

In order that the equipment to be introduced by the project will be effectively and continuously utilized, E-JUST is required to implement the following items

- E-JUST is required to revise the instruction manual if necessary
- E-JUST is required to have communication regularly with AEDC for better operation and maintenance
- E-JUST is required to endeavor to develop human resources continuously to keep the sustainability of the above said activities

Appendix 6　Other Relevant Data／Solar Radiation Simulation

Solar Radiation Simulation

1. Estimated Annual Power Generation (Actual Solar Radiation with shadow effect)

A1. ATRIUM (40 kW)	57,324	kWh/year
B1. PLAZA (180 kW)	276,596	kWh/year
C1. PARKING (200 kW)	307,755	kWh/year
D1. Total Power Generation	641,675	kWh/year

2. Estimated Annual Power Generation (Solar Radiation without shadow effect)

A2. ATRIUM (40 kW)	59,253	kWh/year
B2. PLAZA (180 kW)	277,096	kWh/year
C2. PARKING (200 kW)	307,884	kWh/year
D2. Total Power Generation	644,233	kWh/year

3. Solar Radiation Percentage

(A) ATRIUM

A1. Power Generation (Actual Solar Radiation with shadow effect)	57,324	kWh/year
A2. Power Generation (Solar Radiation without shadow effect)	59,253	kWh/year
Solar Radiation Percentage	**0.967**	

(B) PLAZA

B1. Power Generation (Actual Solar Radiation with shadow effect)	276,596	kWh/year
B2. Power Generation (Solar Radiation without shadow effect)	277,096	kWh/year
Solar Radiation Percentage	**0.998**	

(C) PARKING

C1. Power Generation (Actual Solar Radiation with shadow effect)	307,755	kWh/year
C2. Power Generation (Solar Radiation without shadow effect)	307,884	kWh/year
Solar Radiation Percentage	**0.9996**	

(D) TOTAL

D1. Power Generation (Actual Solar Radiation with shadow effect)	641,675	kWh/year
D2. Power Generation (Solar Radiation without shadow effect)	644,233	kWh/year
Solar Radiation Percentage	**0.9960**	

A. ATRIUM

PV Output PV: 40 kW
Total Coefficient Kt: 0.7
Slope Coefficient Ks: 1.02
Panel Direction 236 ℃(South West)
Panel Slope 30 °

A1. Actual Solar Radiation

Month	PV Rated Output (kW)	Solar Radiation (kWh/d)	Slope Coefficient	Total Coefficient	Radiation Coefficient	No. of Days	Power Generation (kWh)
1	40	3.04	1.02	0.7	0.91	31	2,449
2	40	3.94	1.02	0.7	0.94	28	2,962
3	40	5.32	1.02	0.7	0.97	31	4,569
4	40	6.62	1.02	0.7	0.98	30	5,559
5	40	7.56	1.02	0.7	0.99	31	6,626
6	40	8.36	1.02	0.7	1	30	7,163
7	40	8.13	1.02	0.7	0.99	31	7,126
8	40	7.48	1.02	0.7	0.98	31	6,490
9	40	6.38	1.02	0.7	0.97	30	5,302
10	40	4.94	1.02	0.7	0.94	31	4,111
11	40	3.54	1.02	0.7	0.91	30	2,760
12	40	2.80	1.02	0.7	0.89	31	2,206
Estimated annual power generation						365	57,324

A2. 100% Solar Radiation

Month	PV Rated Output (kW)	Solar Radiation (kWh/d)	Slope Coefficient	Total Coefficient	Radiation Coefficient	No. of Days	Power Generation (kWh)
1	40	3.04	1.02	0.7	1	31	2,691
2	40	3.94	1.02	0.7	1	28	3,151
3	40	5.32	1.02	0.7	1	31	4,710
4	40	6.62	1.02	0.7	1	30	5,672
5	40	7.56	1.02	0.7	1	31	6,693
6	40	8.36	1.02	0.7	1	30	7,163
7	40	8.13	1.02	0.7	1	31	7,198
8	40	7.48	1.02	0.7	1	31	6,622
9	40	6.38	1.02	0.7	1	30	5,466
10	40	4.94	1.02	0.7	1	31	4,374
11	40	3.54	1.02	0.7	1	30	3,033
12	40	2.8	1.02	0.7	1	31	2,479
Estimated annual power generation						365	59,253

B. PLAZA

PV Output PV:	180 kW
Total Coefficient Kt:	0.7
Slope Coefficient Ks:	1.06
Panel Direction	146 ℃(South East)
Panel Slope	30 °

C1. Actual Solar Radiation

Month	PV Rated Output (kW)	Solar Radiation (kWh/d)	Slope Coefficient	Total Coefficient	Radiation Coefficient	No. of Days	Power Generation (kWh)
1	180	3.04	1.06	0.7	0.99	31	12,461
2	180	3.94	1.06	0.7	1	28	14,734
3	180	5.32	1.06	0.7	1	31	22,027
4	180	6.62	1.06	0.7	1	30	26,525
5	180	7.56	1.06	0.7	1	31	31,301
6	180	8.36	1.06	0.7	1	30	33,497
7	180	8.13	1.06	0.7	1	31	33,661
8	180	7.48	1.06	0.7	1	31	30,970
9	180	6.38	1.06	0.7	1	30	25,563
10	180	4.94	1.06	0.7	1	31	20,453
11	180	3.54	1.06	0.7	0.99	30	14,042
12	180	2.80	1.06	0.7	0.98	31	11,361
Estimated annual power generation						365	276,596

B2. 100% Solar Radiation

Month	PV Rated Output (kW)	Solar Radiation (kWh/d)	Slope Coefficient	Total Coefficient	Radiation Coefficient	No. of Days	Power Generation (kWh)
1	180	3.04	1.06	0.7	1	31	12,587
2	180	3.94	1.06	0.7	1	28	14,734
3	180	5.32	1.06	0.7	1	31	22,027
4	180	6.62	1.06	0.7	1	30	26,525
5	180	7.56	1.06	0.7	1	31	31,301
6	180	8.36	1.06	0.7	1	30	33,497
7	180	8.13	1.06	0.7	1	31	33,661
8	180	7.48	1.06	0.7	1	31	30,970
9	180	6.38	1.06	0.7	1	30	25,563
10	180	4.94	1.06	0.7	1	31	20,453
11	180	3.54	1.06	0.7	1	30	14,184
12	180	2.80	1.06	0.7	1	31	11,593
Estimated annual power generation						365	277,096

C. PARKING

PV Output PV:	200 kW
Total Coefficient Kt:	0.7
Slope Coefficient Ks:	1.06
Panel Direction	146 ℃(South East)
Panel Slope	30 °

C1. Actual Solar Radiation

Month	PV Rated Output (kW)	Solar Radiation (k	Slope Coefficient	Total Coefficient	Radiation Coefficient	No. of Days	Power Generation (kWh)
1	200	3.04	1.06	0.7	1	31	13,985
2	200	3.94	1.06	0.7	1	28	16,371
3	200	5.32	1.06	0.7	1	31	24,474
4	200	6.62	1.06	0.7	1	30	29,472
5	200	7.56	1.06	0.7	1	31	34,779
6	200	8.36	1.06	0.7	1	30	37,219
7	200	8.13	1.06	0.7	1	31	37,401
8	200	7.48	1.06	0.7	1	31	34,411
9	200	6.38	1.06	0.7	1	30	28,404
10	200	4.94	1.06	0.7	1	31	22,726
11	200	3.54	1.06	0.7	1	30	15,760
12	200	2.80	1.06	0.7	0.99	31	12,752
Estimated annual power generation						365	307,755

C2. 100% Solar Radiation

Month	PV Rated Output (kW)	Solar Radiation (k Wh/d)	Slope Coefficient	Total Coefficient	Radiation Coefficient	No. of Days	Power Generation (kWh)
1	200	3.04	1.06	0.7	1	31	13,985
2	200	3.94	1.06	0.7	1	28	16,371
3	200	5.32	1.06	0.7	1	31	24,474
4	200	6.62	1.06	0.7	1	30	29,472
5	200	7.56	1.06	0.7	1	31	34,779
6	200	8.36	1.06	0.7	1	30	37,219
7	200	8.13	1.06	0.7	1	31	37,401
8	200	7.48	1.06	0.7	1	31	34,411
9	200	6.38	1.06	0.7	1	30	28,404
10	200	4.94	1.06	0.7	1	31	22,726
11	200	3.54	1.06	0.7	1	30	15,760
12	200	2.80	1.06	0.7	1	31	12,881
Estimated annual power generation						365	307,884

Appendix 7 References

No.	NAME	FORM	Original or Copy	Issuing Institution	Date of Publication
1	TOR of Architecture Competition of E-JUST	Book	Copy	E-JUST	2009
2	Directory Structure and File Naming Convention	Book	Copy	E-JUST	2008
3	Strategic Vision and Mission of E-JUST	Book	Copy	E-JUST	2008
4	Graduate Program	Book	Copy	E-JUST	2008
5	History of E-JUST	Book	Copy	E-JUST	2008
6	Meteorological Data	Book	Copy	E-JUST	2008
7	Ministry of Electricity and Energy Annual Report	Book	Copy	Ministry of Electricity and Energy	2008
8	Financial Data for NREA	Book	Copy	NREA	2010
9	Price List for Cables in Egypt	Book	Copy	NREA	2010
10	NREA Annual Report	Book	Copy	NREA	2007
11	Egyptian Solar Radiation Atlas	Book	Original	NREA	1998
12	Custom Law	Book	Copy	Ministry of Finance	2005
13	Custom Law Tariff	Book	Copy	Ministry of Finance	2008
14	The Income Tax Law	Book	Copy	Ministry of Finance	2005
15	The Environment Law	Book	Copy	Ministry of Finance	1994
16	EIA guidelines	Book	Copy	Ministry of State for the Environment	2007
17	Alexandria Electricity Company Distribution Brochure	Book	Original	AEDC	2008