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資料１．調査団員・氏名

グルジア国、エジプト国太陽光を活用したクリーンエネルギー導入計画　団員名簿

第一次協力準備調査団（2009 年 9 月 26 日～10 月 9 日）

1.	浅見　栄次	団長	独立行政法人国際協力機構 東・中央アジア部 中央アジア・コーカサス課
2.	金縄　知樹	計画管理	独立行政法人国際協力機構 資金協力支援部、設計・積算審査室
3.	及川　政行	調達管理計画	クラウンエイジェンツ
4.	加藤　宏承	業務主任/ 太陽光発電システム	（株）オリエンタルコンサルタンツ
5.	山崎　啓治	系統連系 太陽光発電システム	（株）オリエンタルコンサルタンツ
6.	大村　弘	機材・設備計画	（株）オリエンタルコンサルタンツ
7.	森田　澄夫	調達計画/積算 1	（株）オリエンタルコンサルタンツ
8.	月舘　吉一	制度・基準/環境社会配慮	（株）オリエンタルコンサルタンツ
9.	与座　昌敏	系統運用	（株）オリエンタルコンサルタンツ
10.	依田　雅子	建築設計	（株）オリエンタルコンサルタンツ
11.	加藤　佑希	業務調整	（株）オリエンタルコンサルタンツ

第二次協力準備調査団（2009 年 11 月 25 日～12 月 22 日）

1.	加藤　宏承	業務主任/ 太陽光発電システム	（株）オリエンタルコンサルタンツ
2.	山崎　啓治	系統連系 太陽光発電システム	（株）オリエンタルコンサルタンツ
3.	大村　弘	機材・設備計画	（株）オリエンタルコンサルタンツ
4.	森田　澄夫	調達計画/積算 1	（株）オリエンタルコンサルタンツ
5.	月舘　吉一	制度・基準/環境社会配慮	（株）オリエンタルコンサルタンツ
6.	与座　昌敏	系統運用	（株）オリエンタルコンサルタンツ
7.	依田　雅子	建築設計	（株）オリエンタルコンサルタンツ
8.	加藤　佑希	業務調整	（株）オリエンタルコンサルタンツ

協力準備追加調査 1（2010 年 8 月 28 日～9 月 5 日）

1.	住吉　央	エネルギー・資源課 課長	独立行政法人国際協力機構 産業開発部　資源・エネルギーグループ エネルギー・資源課 課長
2.	加藤　宏承	業務主任/ 太陽光発電システム	（株）オリエンタルコンサルタンツ

協力準備追加調査 2（2010 年 11 月 6 日～11 月 12 日）

1.	吉田　稔	土木	（株）オリエンタルコンサルタンツ

協力準備追加調査 3（2011 年 1 月 31 日～2 月 17 日）

1.	福若　雅一	資金協力技術アドバイザー	独立行政法人国際協力機構
2.	松田　博幸	計画管理	独立行政法人国際協力機構 産業開発部　資源・エネルギーグループ エネルギー・資源課
3.	加藤　宏承	業務主任/ 太陽光発電システム	（株）オリエンタルコンサルタンツ
4.	山崎　啓治	系統連系 太陽光発電システム	（株）オリエンタルコンサルタンツ
5.	森田　澄夫	調達計画/積算 1	（株）オリエンタルコンサルタンツ
6.	依田　雅子	建築設計	（株）オリエンタルコンサルタンツ
7.	今澤　悠次郎	土木	（株）オリエンタルコンサルタンツ

協力準備追加調査 4（2011 年 9 月 5 日～9 月 30 日）

1.	戸塚　眞治	ウズベキスタン事務所職員	独立行政法人国際協力機構
2.	杉本　巨	ウズベキスタン事務所職員	独立行政法人国際協力機構
3.	加藤　宏承	業務主任/ 太陽光発電システム	（株）オリエンタルコンサルタンツ
4.	山崎　啓治	系統連系 太陽光発電システム	（株）オリエンタルコンサルタンツ
5.	大村　弘	機材・設備計画	（株）オリエンタルコンサルタンツ
6.	依田　雅子	建築設計	（株）オリエンタルコンサルタンツ

第三次協力準備調査団（2012 年 2 月 26 日～3 月 5 日）

1.	住吉　央	エネルギー・資源課 課長	独立行政法人国際協力機構 産業開発部　資源・エネルギーグループ エネルギー・資源課 課長
2.	加藤　宏承	業務主任/ 太陽光発電システム	（株）オリエンタルコンサルタンツ
3.	山崎　啓治	系統連系 太陽光発電システム	（株）オリエンタルコンサルタンツ
4.	大村　弘	機材・設備計画	（株）オリエンタルコンサルタンツ

資料２．調査行程

第一次協力準備調査（2009 年 9 月 26 日～10 月 9 日）

月日		官団員			コンサルタント							
		団長	計画管理	調達管理計画	業務主任/太陽光システム	系統連系太陽光発電システム	機材・設備計画	調達計画/積算1	制度・基準/環境社会配慮	系統運用	建築設計	業務調整
		浅見　栄次	金縄　知樹	及川　政行	加藤　宏承	山崎　啓治	大村　弘	森田　澄夫	月舘　吉一	与座　昌敏	依田　雅子	加藤　佑希
9月26日	土	成田発(12:20)−ミュンヘン着(17:35) LH715 ミュンヘン発(21:15)−										
9月27日	日	トビリシ着(03:00)　LH3214			成田発(12:20)−ミュンヘン着(17:35) LH715 ミュンヘン発(21:15)−							業務主任に同じ
9月28日	月	大使館表敬			トビリシ着(03:00)　LH3214 JICA表敬、大使館表敬、大使館安全ブリーフィング、 外務省表敬、 環境保全・天然資源省表敬および協議							業務主任に同じ
9月29日	火	環境保全・天然資源省インセプション協議・技術協議、 環境保全・天然資源省サイト調査、 財務省表敬、 エネルギー省表敬					環境保全・天然資源省技術協議、環境保全・天然資源省サイト調査、関係機関協議		業務主任に同じ	環境保全・天然資源省技術協議、環境保全・天然資源省サイト調査、関係機関協議		業務主任に同じ
9月30日	水	難民キャンプ候補サイト調査、 イリア国立大学・トビリシ第199学校候補サイト調査、関係機関協議										業務主任に同じ
10月1日	木	環境保全・天然資源省ミニッツ協議					候補サイト確認、機材・設備調査	候補サイト確認、調達調査	候補サイト確認、制度・基準調査	候補サイト確認、系統運営調査	候補サイト確認、施設現況調査	業務主任に同じ
10月2日	金	環境保全・天然資源省ミニッツ署名、 大使館へ報告					機材・設備調査	調達調査	環境社会配慮調査	系統運営調査	施設現況調査	業務主任に同じ
10月3日	土	トビリシ発(04:00)ーミュンヘン着(05:55) LH3215 ミュンヘン発(15:40)ー			関係機関協議・日射量調査		機材・設備調査	調達調査	制度・基準調査	日射量調査	施設現況調査	業務主任に同じ
10月4日	日	成田着(10:25) LH714			資料整理、団内会議							業務主任に同じ
10月5日	月				関係機関協議・日射量調査		機材・設備調査	調達調査	制度・基準調査	日射量調査	施設現況調査	業務主任に同じ
10月6日	火				関係機関・他ドナー協議		機材・設備調査	調達調査	環境社会配慮調査	系統運営調査	建設状況調査	業務主任に同じ
10月7日	水				先方実施計画・実施体制調査		機材・設備調査	調達調査	環境社会配慮調査	系統運営調査	建設状況調査	業務主任に同じ
10月8日	木				機材の数量及び仕様の妥当性の検討		機材・設備調査	調達調査	環境社会配慮調査	系統運営調査	建設状況調査	業務主任に同じ
10月9日	金				無償資金協力実施の意義の確認と基本構想の検討 事業効果の評価、課題の提示と協力実施に係る提言のまとめ （→引き続きエジプト現地調査へ）							業務主任に同じ

第二次協力準備調査（2009 年 11 月 25 日～12 月 22 日）

月日		官ベース団員	コンサルタント						
			業務主任/太陽光システム	系統連系太陽光発電システム	機材・設備計画	系統運用	調達計画/積算1	建築設計	制度・基準/環境社会配慮	業務調整
			加藤　宏承	山崎　啓治	大村　弘	与座　昌敏	森田　澄夫	依田　雅子	月舘　吉一	加藤　佑希
11月25日	水		成田発(12:05)−ウィーン着(16:00) OS52/D ウィーン発(22:25)−							
11月26日	木	大使館表敬	トビリシ着(05:00)　OS653/D							
			大使館表敬		設置場所測量、サイト調査		調達事情、単価調査	サイト測量	環境社会配慮調査	業務主任に同じ
11月27日	金	環境保全・天然資源省、エネルギー省、イリア国立大学表敬訪問、ミニッツ会議			設置場所測量、サイト調査		調達事情、単価調査	サイト測量	環境社会配慮調査	業務主任に同じ
11月28日	土	ミニッツ会議			設置場所測量、サイト調査		調達事情、単価調査	基本設計検討	環境社会配慮調査	業務主任に同じ
11月29日	日		資料整理							業務主任に同じ
11月30日	月	環境保全・天然資源省、イリア国立大学協議	太陽光発電システム、容量検討		受変電設備結線図・機器仕様検討		調達事情、単価調査	基本設計検討 協議用イメージ図作成	環境社会配慮調査 エネルギー省協議	業務主任に同じ
12月1日	火	環境保全・天然資源省、イリア国立大学協議	環境保全・天然資源省、イリア国立大学協議、太陽光発電システム、容量検討		受変電設備結線図・機器仕様検討		調達管理費の積算、調達計画の検討	基本設計検討 協議用イメージ図作成	環境社会配慮調査 石油ガス公社調査	業務主任に同じ
12月2日	水		環境保全・天然資源省、イリア国立大学協議	受変電設備結線図・機器仕様検討			調達事情、単価調査	環境保全・天然資源省、大学協議	環境社会配慮調査 ローカルコン調査	業務主任に同じ
12月3日	木		太陽光発電システム、容量検討				施工計画検討	基本設計検討 図面作成	環境社会配慮調査	業務主任に同じ
12月4日	金		太陽光発電システム、容量検討				施工計画検討	基本設計検討 図面作成	環境社会配慮調査	業務主任に同じ
12月5日	土		年間発電量等算出				施工計画検討	基本設計検討 図面作成	環境社会配慮調査	業務主任に同じ
12月6日	日		資料整理							
12月7日	月		環境保全・天然資源省協議				建築積算	テクニカルスペック検討	基準・制度調査	業務主任に同じ
12月8日	火		イリア国立大学協議、配電会社協議				建築積算、ボーリング会社打合せ	テクニカルスペック検討	基準・制度調査	業務主任に同じ
12月9日	水		太陽光発電システム、容量検討				建築積算、ボーリング作業管理	図面作成	基準・制度調査	業務主任に同じ
12月10日	木		太陽光発電システム、受変電設備結線図・機器仕様書作成				建築積算、ボーリング作業管理	図面作成	基準・制度調査	業務主任に同じ
12月11日	金		太陽光発電システム、受変電設備結線図・機器仕様書作成、イリア国立大学協議				建築積算、輸送会社打合せ	図面作成	基準・制度調査	業務主任に同じ
12月12日	土		太陽光発電システム、受変電設備結線図・機器仕様書作成、機材価格市場調査				建築積算	図面作成	トビリシ発(05:45)−ウィーン着(06:30) OS654/D	業務主任に同じ
12月13日	日		資料整理						ウィーン発(14:10)−	業務主任に同じ
12月14日	月	ミニッツ協議	イリア国立大学協議、太陽光発電システム、受変電設備結線図・機器仕様書作成				機材積算	図面作成	成田着(09:30) OS51/D	業務主任に同じ
12月15日	火	ミニッツ調印	イリア国立大学協議、太陽光発電システム、受変電設備結線図・機器仕様書作成				機材積算	図面作成		業務主任に同じ
12月16日	水	イリア国立大学協議	イリア国立大学協議、エネルギー省協議、環境省協議 太陽光発電システム、受変電設備結線図・機器仕様書作成				機材積算	イメージ図作成		業務主任に同じ
12月17日	木		テクニカルメモランダム、報告書作成				機材積算	イメージ図作成		業務主任に同じ
12月18日	金		環境保全・天然資源省、イリア国立大学協議				機材積算	環境保全・天然資源省、イリア国立大学協議		業務主任に同じ
12月19日	土		調査結果とりまとめ							業務主任に同じ
12月20日	日		資料整理							業務主任に同じ
12月21日	月		トビリシ発(05:45)ーウィーン着(06:30)　OS654/D ウィーン発(14:10)−							業務主任に同じ
12月22日	火		成田着(09:30)　LH585 OS51/D							業務主任に同じ

協力準備追加調査 1（2010 年 8 月 28 日～9 月 5 日）

月日		官団員	コンサルタント
		団長	業務主任/太陽光システム
		住吉　央	加藤　宏承
8月28日	土		成田発(13:35)→イスタンブール着(19:40) TK0515 イスタンブール発(23:30)→
8月29日	日		トビリシ着(02:45) TK386
8月30日	月	成田発→ウィーン着 ウィーン発→	関係機関協議
8月31日	火	トビリシ着 エネルギー省協議 大使館表敬 サイト調査 団内会議	関係機関協議 団内会議
9月1日	水	環境保全・天然資源省協議	
9月2日	木	環境保全・天然資源省協議	
9月3日	金	環境保全・天然資源省協議 大使館へ報告	
9月4日	土	トビリシ発→ウィーン着 ウィーン発→	トビリシ発(04:05)→イスタンブール着(05:35) TK387 イスタンブール発(18:30)→
9月5日	日	成田着	成田着(11:15) LH 714TK050

協力準備追加調査 2（2010 年 11 月 6 日～11 月 12 日）

月日		土木
		吉田　稔
11月6日	土	成田発(13:25)→ミュンヘン着(17:35) LH715 ミュンヘン発(21:10)→
11月7日	日	トビリシ着(03:55) LH 2556
11月8日	月	環境保全・天然資源省表敬訪問 サイト調査
11月9日	火	環境保全・天然資源省ヒアリング サイト調査
11月10日	水	サイト調査 環境保全・天然資源省調査結果報告
11月11日	木	トビリシ発(04:55)→ミュンヘン着(05:55) LH 2557 ミュンヘン発(15:35)→
11月12日	金	成田着(11:20) LH 714

協力準備追加調査 3（2011 年 1 月 31 日～2 月 17 日）

月日		官団員		コンサルタント				
		資金協力技術アドバイザー	計画管理	業務主任/太陽光システム	土木	建築設計	系統連系太陽光発電システム	調達計画/積算1
		福若雅一	松田博幸	加藤 宏承	今澤 悠次郎	依田 雅子	山崎 啓治	森田 澄夫
1月31日	月			成田発(14:25)→イスタンブール着(20:05) TK51 イスタンブール発(23:25)→				
2月1日	火			→トビリシ着(3:40) TK386 環境保全・天然資源省表敬、サイト調査				
2月2日	水			土木調査、サイト調査				
2月3日	木			土木調査、サイト調査				
2月4日	金			土木調査、サイト調査				
2月5日	土	成田発(13:25)→ミュンヘン着(17:35) LH715 ミュンヘン発(21:10)		調査結果とりまとめ				
2月6日	日	→トビリシ着(03:55) LH2556 サイト視察（環境保全・天然資源省） サイト視察（大学） 団内打合せ		サイト視察（環境保全・天然資源省） サイト視察（大学） 団内打合せ				
2月7日	月	調査結果取りまとめ、団内打合せ ミニッツ協議				太陽光発電システム、容量、 パネル設置計画検討		成田発(14:25)→イスタンブール着(20:05) TK051 イスタンブール発(23:25)→
2月8日	火	ミニッツ協議 大使館表敬				太陽光発電システム、容量、 パネル設置計画検討		→トビリシ着(03:40) TK386
2月9日	水	トビリシ発(04:55)→ミュンヘン着(05:55) LH2557 ミュンヘン発(15:35)→		太陽光発電システム、容量、 パネル設置計画検討	土木検討	太陽光発電システム、容量、 パネル設置計画検討		単価調査
2月10日	木	成田着(11:20) LH714		太陽光発電システム、容量、 パネル設置計画検討	土木検討	太陽光発電システム、容量、 パネル設置計画検討		単価調査
2月11日	金			12:00 環境保全・天然資源省、配電会社協議				単価調査
2月12日	土			太陽光発電システム、容量、 パネル設置計画検討	土木検討	太陽光発電システム、容量、 パネル設置計画検討		トビリシ発(05:15)→イスタンブール着(05:45) TK387 イスタンブール発(17:50)→
2月13日	日			太陽光発電システム、容量、 パネル設置計画検討	土木検討	太陽光発電システム、容量、 パネル設置計画検討		→成田着(12:25) TK050
2月14日	月			調査結果とりまとめ				
2月15日	火			環境保全・天然資源省協議				
2月16日	水			トビリシ発(18:25)→イスタンブール着(18:55) TK383 イスタンブール発(23:55)→				
2月17日	木			→関西国際空港着(17:55) TK46 関西国際空港発(19:45)→羽田着(21:00) NH148				

協力準備追加調査 4（2011 年 9 月 5 日～9 月 30 日）

月日		官団員	業務主任/ 太陽光システム	系統連系太陽光発電システム	機材・設備計画	建築設計
		杉本 巨	加藤 宏承	山崎 啓治	大村 弘	依田 雅子
9月5日	月		NRT発(12:00)-イスタンブール着(18:05) TK051　イスタンブール発 (23:30)-			
9月6日	火		トビリシ着(02:45) TK386			
		トビリシ着	グルジア空港管理会社(UAG)表敬、サイト調査			
9月7日	水	経済開発省表敬 UAGミニッツ協議	サイト調査、UAG協議			
9月8日	木	ミニッツ協議	サイト調査・UAG及び関係機関協議			
9月9日	金	大使館報告	サイト調査・UAG及び関係機関協議			
9月10日	土	トビリシ発	イリア・チャフチャヴァゼ国立大学サイト調査			
9月11日	日		資料整理			
9月12日	月		太陽光発電システム容量・レイアウト検討		機材・設備検討	基本設計検討
9月13日	火		太陽光発電システム容量・レイアウト検討		機材・設備検討	基本設計検討
9月14日	水		太陽光発電システム容量・レイアウト検討		機材・設備検討	基本設計検討
9月15日	木		太陽光発電システム容量・レイアウト検討		機材・設備検討	基本設計検討 図面作成
9月16日	金		太陽光発電システム案作成			
9月17日	土		太陽光発電システム案作成			
9月18日	日		資料整理			
9月19日	月		UAG及び関係機関協議			
9月20日	火		太陽光発電システム容量・レイアウト検討		機材・設備検討	基本設計検討 図面作成
9月21日	水		太陽光発電システム容量・レイアウト検討		機材・設備検討	基本設計検討 図面作成
9月22日	木		UAG及び関係機関協議			
9月23日	金		太陽光発電システム、受変電設備結線図・機器仕様書作成			イメージ図作成
9月24日	土		太陽光発電システム、受変電設備結線図・機器仕様書作成			イメージ図作成
9月25日	日		資料整理、団内会議			
9月26日	月		太陽光発電システム、受変電設備結線図・機器仕様書作成			イメージ図作成
9月27日	火		テクニカルメモランダム、報告書作成			
9月28日	水		UAG及び関係機関協議			
9月29日	木		トビリシ発(04:05－イスタンブール着(05:35) TK 387 イスタンブール発(16:55) TK50			
9月30日	金		NRT着(10:10)			

第三次協力準備調査　（2012 年 2 月 26 日～3 月 5 日）

月日		官団員	業務主任/ 太陽光システム	系統連系太陽光発電システム	機材・設備計画
		住吉　央	加藤　宏承	山崎　啓治	大村　弘
2月26日	日		成田(14:40)TK051/D→ イスタンブール(20:00) イスタンブール(23:25)TK386/D→		
2月27日	月		トビリシ(03:40) JIC事務所ミーティング		サイト調査
2月28日	火	成田(12:50)LH7203→ ミュンヘン(17:05) ミュンヘン(21:15)LH2556→	サイト調査、UAG及びイリア国立大学との協議		サイト調査
2月29日	水	トビリシ(03:59) 経済開発省とのミニッツ協議	経済開発省とのミニッツ協議		サイト調査
3月1日	木	UAG及びイリア国立大学とのミニッツ協議			サイト調査
3月2日	金	ミニッツ締結、大使館表敬訪問及び報告	ミニッツ締結、大使館表敬訪問及び報告		サイト調査
3月3日	土	トビリシ(04:55)LH2557→ ミュンヘン(06:00) ミュンヘン(15:35)LH714→	資料整理		
3月4日	日	成田(11:15)	トビリシ(05:20)TK387/D→ イスタンブール(05:50) イスタンブール(18:40)TK050/D→		
3月5日	月		成田(13:10)		

資料３．関係者（面会者）リスト

関係者（面会者）リスト

第一次協力準備調査　（2009年 9月26日～10月 9日）
第二次協力準備調査　（2009年11月25日～12月22日）
協力準備追加調査 1（2010 年 8 月 28 日～9 月 5 日）
協力準備追加調査 2（2010 年 11 月 6 日～11 月 12 日）
協力準備追加調査 3（2011 年 1 月 31 日～2 月 17 日）
協力準備追加調査 4（2011 年 9 月 5 日～9 月 30 日）
第三次協力準備調査　（2012 年 2 月 26 日～3 月 5 日）

1. 在グルジア日本国大使館

畦地　勇	参事官
宝川　真純	専門調査員

2. JICA　グルジア事務所

山中　美子	プロジェクトアドバイザー
David Mgaloblishvili	コーディネーター

3. JICA　ウズベキスタン事務所

戸塚　眞治	事務所職員
杉本　巨	事務所職員

4. 経済・持続的開発省（Ministry of Economy and Sustainable Development）

Vera Kobalia	Minister
George Karbelashvili	Deputy Minister

5. 環境保全・天然資源省（Ministry of Environment Protection and Natural Resources of Georgia）

Mr. Giorgi Khachidze	Minister
Mr. Alex Machavariani	First Deputy Minister
Mr. Gocha Mamatsashvili	First Deputy Minister
Mr. Tushishvili	Deputy Head of Department of Integrated Environmental Management
Mr. Giorgi Putkaradze	Head of Administrative Department
Mr. Paata Chipashvili	Head of Department of Integrated Environmental Management
Mr. Tornike Phulariani	Head of Environmental Policy Division
Ms. Nino Sharashidze	International Department
Mr. Grigol Lazriev	Department of Sustainable Development
Ms. Medea Inashvi	Department of Sustainable Development

6. 外務省（Ministry of Foreign Affair of Georgia）

Mr. M. Tsikhelashvili	Head of Department of International Economic, Cultural and Humanitarian Relations
Ms. Nana Gaprindashvili	Counselor, Department of Asia, Africa, Australia and Pacific Rim

7. 財務省（Ministry of Finance of Georgia）

Mr. Dimitri Gvindadze	Deputy Minister

8. エネルギー・天然資源省（Ministry of Energy and Natural Resources of Georgia）

Mr. Archil Nikolaishvili	Deputy Minister
Mr. David Shazikadze	Deputy Head of Energy Department
Ms. Marita Arabidze	Senior Experts, International Relations and Investment Projects Department
Mr. Givi Sekania	Chief Specialist, International Relations Division
Mr. Ucha Uchaneishvili	

9. 難民キャンプ

Mr. Goska Kolbaia	Ministry of Refugees and Accommodation of Georgia
Mr. Giorgi Skehgelaia	Ministry of Refugees and Accommodation of Georgia
Mr. Avtandil Lhochishvili	Akhalgori Municipality Parliament, Head of Parliament

10. イリア国立大学

Mr. Gigi Tevzadze	Professor, Rector
Mr. Kakha Karchkhadze	Head of Commercialisation Department

11. トビリシ地区配電会社（Tbilisi Electricity Network：TELASI）

Mr. Tariel Kandelaki	Head of Distribution Network Department
Mr. Temur Gamrekelashvili	Head of L/V Maintenance department
Ms. Rusudan Dochviri	Head of New Customers service office

12. United Airports Georgia Ltd. (UAG)

Ms. Keti Aleksidze	Director
Nodar Lominadze	Deputy Director
Ketivan Vardosanidze	Staff

13. TAV

Mr. Mete Erkal	General Manager
Ms. Tea Zakaradze	HR & Administration Manager
Mr. Candemir Akyildiz	Terminal Operation Manager
Mr. Tamaz Andguladze	Deputy General Manager
Mr. Giorgi Gozalishvili	External Relations Manager
Mr. Levent Akdag	Information Technology Manager
Mr. Bahadir Ataloy	Technical Chief
Mr. Teimusaz Jvassheishvil	Technical Maintenance assistant
Mr. Samushia Tamaz	Electrical System Sheff
Mr. Mdevadze Mikheil	Electrical Engineer

資料４．討議議事録（M/D）

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

The Government of Japan (hereinafter referred to as "GoJ") has established Cool Earth Partnership as a new financial mechanism. Through this, GoJ 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 GoJ 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 GoJ, decided to conduct a Preparatory Survey (hereinafter referred to as "the Survey") on the Project for Clean Energy Promotion Using Solar Photovoltaic System in Georgia (hereinafter referred to as "the Project").

JICA sent to Georgia the Preparatory Survey Team (hereinafter referred to as "the Team"), headed by Mr. Eiji ASAMI, Advisor, Central Asia and the Caucasus Division, East and Central Asia and the Caucasus Department, JICA, and is scheduled to stay in the country from September 27 to October 3.

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

In the course of discussions and field survey, both sides acknowledged confirmed the main items described in the attached sheets.

Tbilisi, October 2, 2009

Eiji ASAMI
Leader
Preparatory Survey Team
Japan International Cooperation Agency
JAPAN

George KHACHIDZE
Minister
Ministry of Environment Protection and
Natural Resources
GEORGIA

Archil NIKOLAISHVILI
Deputy Minister
Ministry of Energy
GEORGIA

ATTACHMENT

1. Current Situation

The Government of Georgia recognizes the threat of the Climate Change to the economy and natural ecosystems and therefore considers development and implementation of the Climate Change-related policy and measures as one of its priorities.

The policy of the Government of Georgia on mitigating the Climate Change defines the measures on reducing Green House Gas emissions in various sectors including the energy sector. In this situation, both sides confirm that the Project, which introduces photovoltaic (PV) power generation systems connected with the national power grid, is one of the pilot systems to enhance the possibility of applying renewable energy.

2. Objective of the Project

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

3. Responsible Organization and Implementing Agency

The responsible and implementing organization is the Ministry of Environment Protection and Natural Resources of Georgia. (hereinafter referred to as the "MOEPNR," whose organization chart is shown in Annex-1.)

The Ministry of Energy of Georgia shall be responsible for technical assistance to the Project.

4. Items Requested by the Government of Georgia

4-1. After discussions with the Team, the installation of the on-grid power generating system using PV including following equipment was requested by the Georgian side.

(1) Solar module (panel)
(2) Junction Box
(3) Power Conditioner
(4) Transformer
(5) Data collecting and display device

4-2. The Georgian side had originally requested seven project sites. After consultation between the Team and MOEPNR, the Georgian side identified four priority candidate sites/facilities for installation of the PV system: Head office building of the Ministry of Environment Protection and Natural Resources of Georgia, Refugee camp in Tserovani, Ilia Chavchavadze State University and School #199 with school pension (Komorovi). The requested project sites are shown in Annex-2. The Team recommended the Georgian side to put the priority order of the requested sites. The priority was confirmed as the following table. The Georgian side understood that the Japan's Program Grant Aid for Environment and Climate Change might not be able to cover all the requested sites and also understood the need to select the sites from the viewpoint of necessity, technical and financial viability, sustainability and cost-effectiveness. The Team understood that Ministry of Energy of Georgia considers it

necessary to carry out the study of candidate allocation places on the next stage of survey in regard of connection to the electricity grid.

Project site	Location	Priority
Head office building of the Ministry of Environment Protection and Natural Resources of Georgia	6 Gulua str, 0114,Tbilisi, Georgia	1
Refugee camp	The village Tserovani (Mtskheta District) 20-25 km from the capital of Georgia	2
Ilia Chavchavadze State University	3/5, Kakutsa Cholokashvili Ave., 0162, Tbilisi, Georgia	3
School #199 with school pension (Komorovi)	49 Vaja Pshavela str. Tbilisi, Georgia	4

4-3. The Georgian side explained that there is no duplication between requested contents of the Project and any other plans implemented by the other donors or the Georgian side.

4-4. The Georgian side has understood that the final component and the design of the Project shall be determined(confirmed) at the timing of 2nd phase of the Preparatory Survey.

4-5. The Team will report the findings and items requested by the Georgian side to JICA Headquarters and the GoJ.

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

The Georgian side understood the Japan's Program Grant Aid for Environment and Climate Change scheme explained by the Team, as described in Annex-3, 4, 5 and 6.

6. Schedule of the Study

6-1. The Team will proceed to further survey in Georgia until October 9 as the 1st phase of the Preparatory Survey. Additional survey might be conducted as the 1st phase of the Preparatory Survey, if necessary.

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

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

7. Other Relevant Issues

7-1 Major Undertakings to be taken by the Georgian side

The Georgian side confirmed that major undertakings as shown in Annex-7 should be taken by the Georgian side at its own expense. In addition, the Georgian side should be responsible for the following issues;

(1) Securing necessary site

- for PV Modules
- for underground cables between PV Modules and Power Conditioners
- for Power Conditioners

(2) Temporary Stockyard during installation of the equipment and materials

(3) Tables and PCs, if necessary

7-2 Preparation of the site

The Georgian side agreed that the site 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.

7-3 Procurement of Equipment

The Team explained that, in accordance with the policy of GoJ, products of Japan shall be procured for major equipment in the Project. The Georgian side understood/agreed.

7-4 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 Georgian side agreed to establish a consultative committee in order to coordinate with the Japanese side which consists of the Embassy of Japan, JICA Project Formulation Advisor in Caucasus Region and the procurement agency. Terms of Reference of the Consultative Committee is referred to Annex-8.

7-5 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.

7-6 Applying JICA Environmental and Social Considerations Guideline

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

7-7 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.

7-8 Customs and Tax exemption

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

7-9. The Georgian side shall ensure the security of all concerned Japanese nationals working for the Project, if deemed necessary.

7-10. The Georgian side shall provide necessary numbers of counterpart personnel to the Team during the period of their studies in Georgia.

7-11 The Georgian side shall submit all the answers to the Questionnaire, which the Team handed to the Georgian side.

<List of Annex>

Annex-1 Organization Chart of Ministry of Environment Protection and Natural Resources of Georgia
Annex-2 Project site / Candidate site of the Project
Annex-3 Program Grant Aid for Environment and Climate Change (Provisional)
Annex-4 General Flow of Program Grant Aid for Environment and Climate Change
Annex-5 Flow of Funds for Project Implementation
Annex-6 Project Implementation System
Annex-7 Major Undertakings to be taken by each Government (Provisional)
Annex-8 Terms of References of the Consultative Committee (Provisional)

Annex – 1

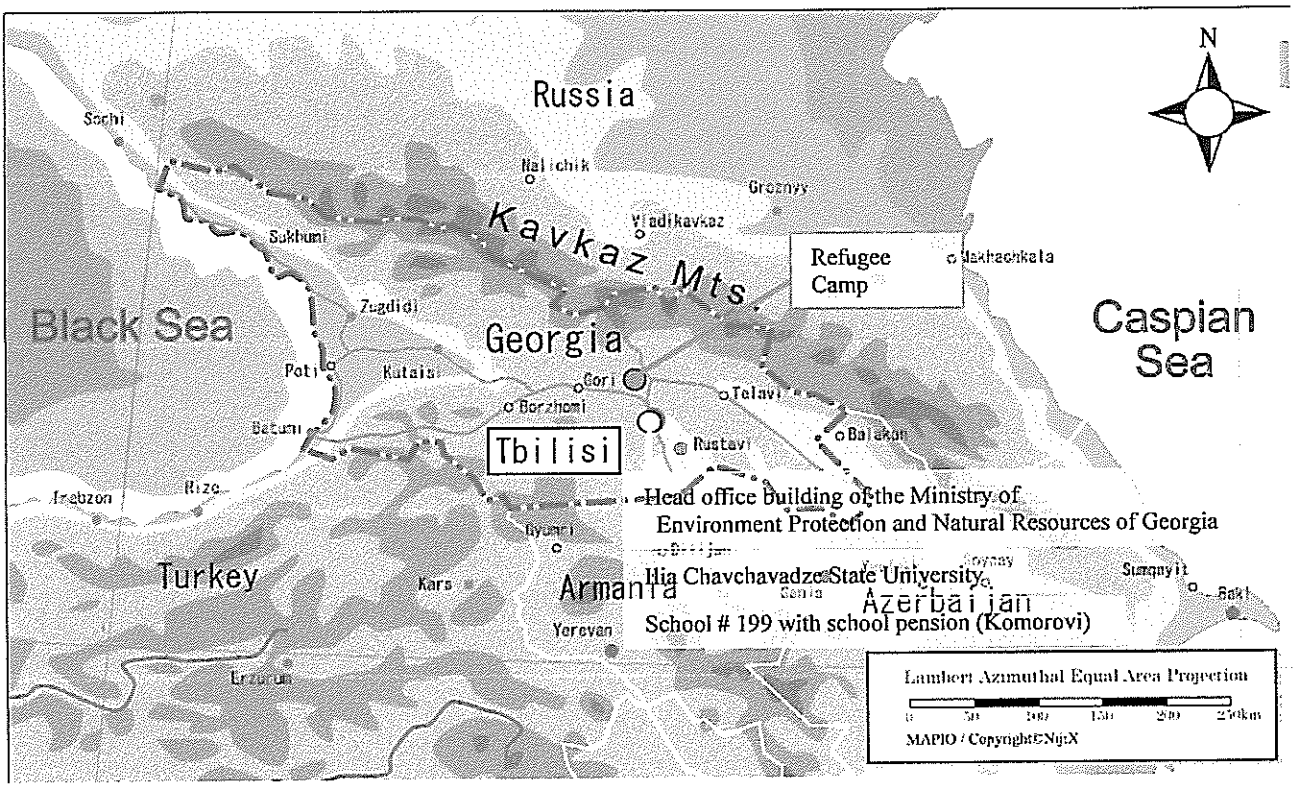
Organization Chart of Ministry of Environment Protection and Natural Resources of Georgia

Minister

	First Deputy Minister	Deputy Minister	Deputy Minister	Deputy Minister
Executive Personnel of Ministry	Service of Public Relations	Legal Department	Forestry Department	Service of Biodiversity
Administrative Department	Inspection of Environmental Protection	Service of Licenses and Permits	Territorial Bodies	Service of Nuclear and Radiation Safety
Department of Investigation	Department of Environmental Policy and International Relations	Department of Integrated Environmental Management	LEPL-National Environmental Agency	Service of Geodesy and Cartography
General Inspectorate	LEPL-Sustainable Development Projects Implementation Agency		LEPL-Basic Sapling Forestry	LEPL-Agency of Protected Areas

Annex – 2

Project site / Candidate site of the Project



Candidate Site	Address
Head office building of the Ministry of Environment Protection and Natural Resources of Georgia	6 Gulua Str., 0114, Tbilisi, Georgia
Refugee camp	The village Tserovani (Mtskheta District) 20-25km from the capital of Georgia
Ilia Chavchavadze State University	5, Kakutsa Cholokashvili Ave., Tbilisi, 0162, Georgia
School # 199 with school pension (Komorovi)	49Vaja Pshavela Str., Tbilisi, Georgia

Annex – 3

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 reffered 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) Selection of firms

In principle, firms of any nationality could be contracted as long as the firms satisfy the conditions specified in the tender documents.

The same applies for any individual consultants who will be involved in the Project and provide services necessary for the training and guidance related to the Project.

The consultants that will be employed to do detail design and supervise the work for the Project, however will be in principle, Japanese nationals recommended by JICA for the purpose of maintaining technical consistency with the Study.

g) 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.

h) 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.

i) 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.

j) 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.

k) 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.

m) 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:

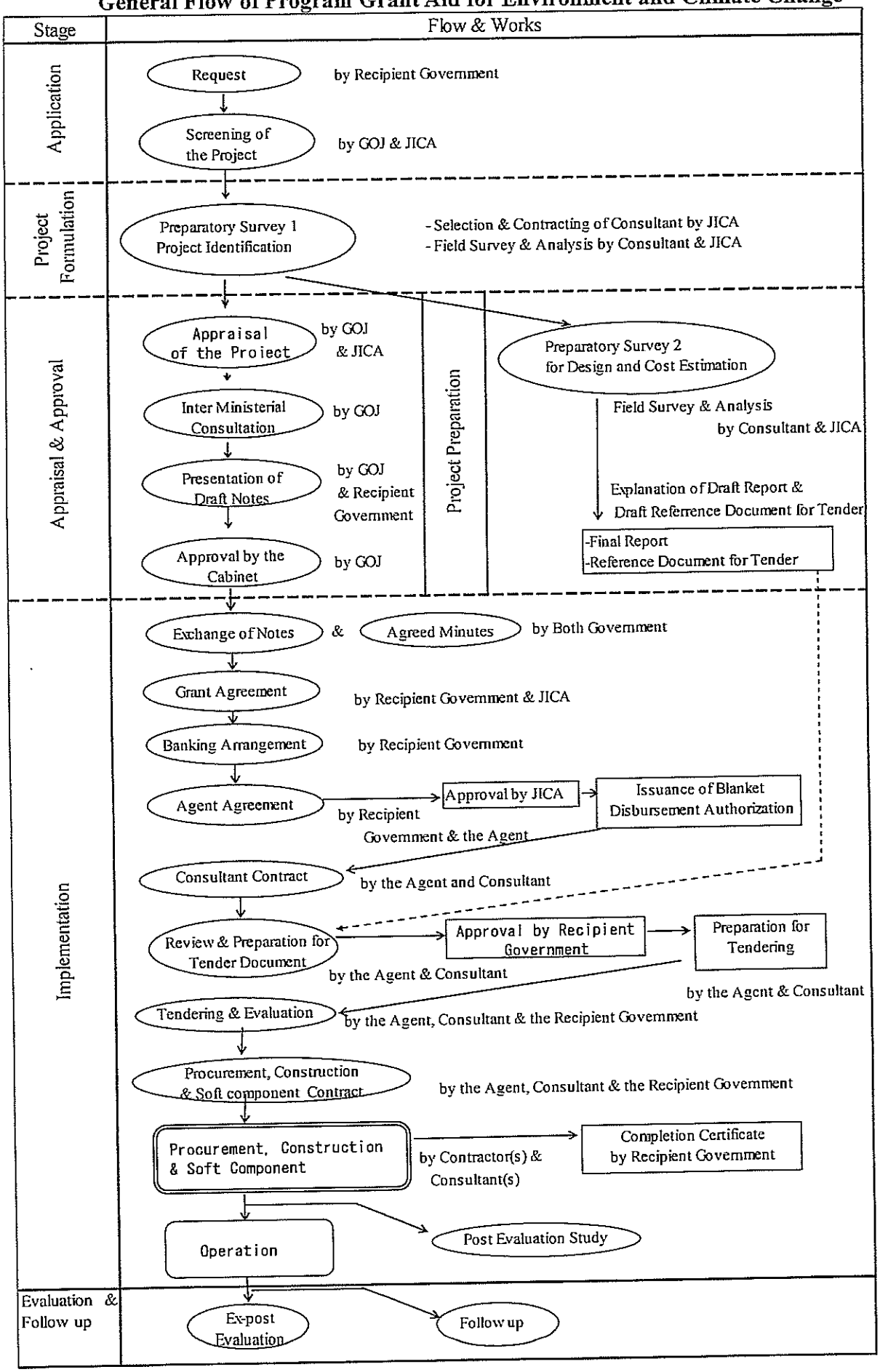
a) To secure land necessary for the sites of the Project and to clear, level and reclaim the land prior to commencement of the Project.
b) To provide facilities for distributing electricity, water supply and drainage and other incidental facilities in and around the sites.
c) To ensure all the expense 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.

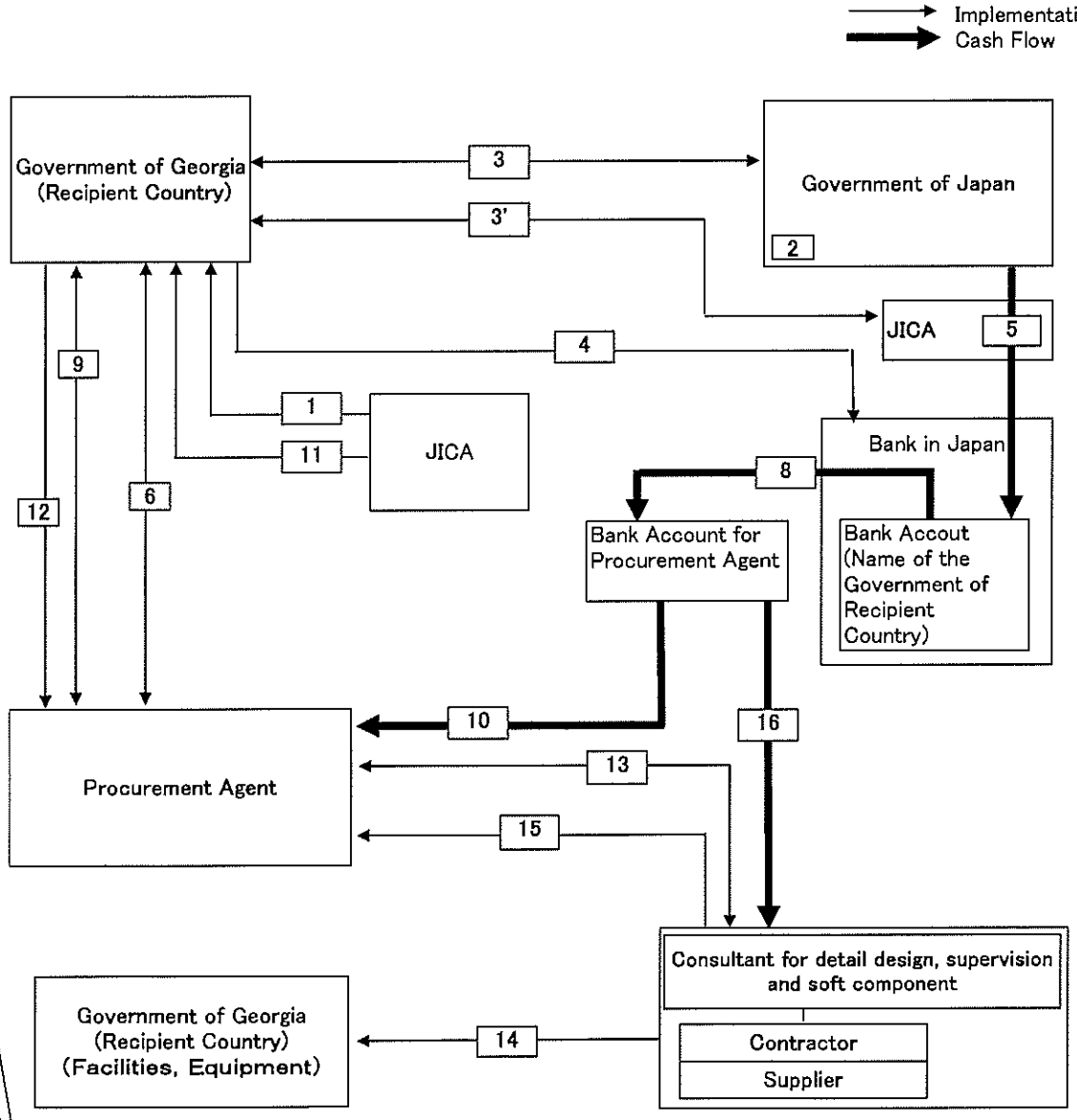
6) "Export and Re-export" of products
The products purchased under the Grant and its accrued interest will not be exported or re-exported from the Recipient.

Annex-4

General Flow of Program Grant Aid for Environment and Climate Change

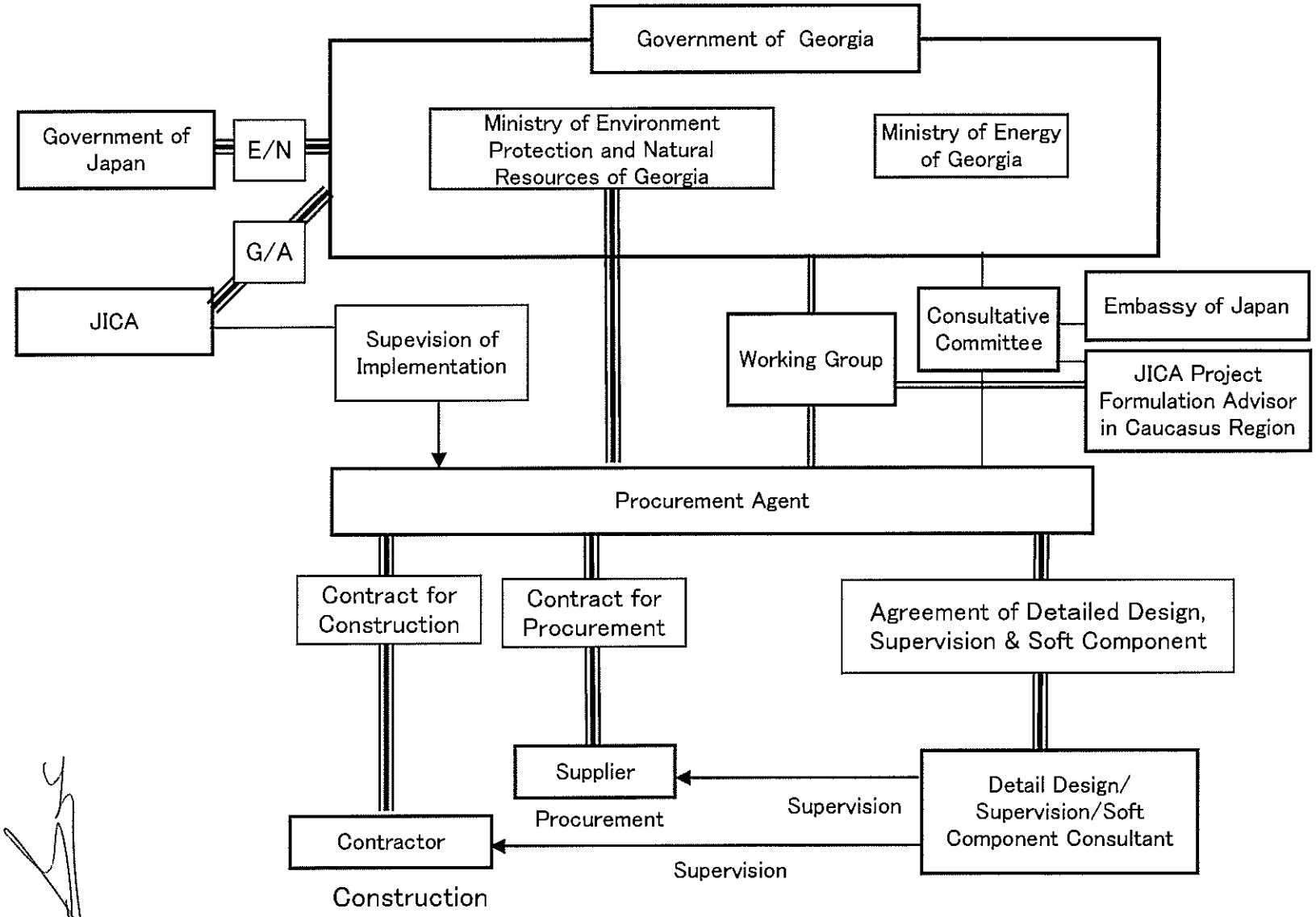


Flow of Funds for Project Implementation



1 Preparatory Survey / Reference Document for Tender
2 Approval of Cabinet
3 Signing of Exchange of Notes (E/N)
3' Signing of Grant Agreement (G/A)
4 Banking Arrangement (B/A)
5 Disbursement of Funds from the Government of Japan
6 Signing of Agent Agreement (A/A) +BDA
7 N/A
8 Transfer of Funds
9 Decision of Project Components
10 Payment of Remuneration for Agent
11 Recommendation of Consultant for Detail Design/Supervision (JICA→Government of Georgia)
12 Recommendation of Consultant for Detail Design / Supervision (Government of Georgia→Procurement Agent)
13 Conclusion of Contract
14 Construction and Procurement
15 Application for Payment
16 Payment

Project Implementation System



Annex-7

Major undertakings to be taken by each Government (Provisional)

No.	Items	To be covered by Grant Aid	To be covered by Recipient Side
1	To secure site		●
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 roads		
	1) Within the site	●	
	2) Outside the site and Access road		●
5	To construct the facility and install the equipment	●	
6	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	●	
7	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		●
8	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	●	
9	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.		●
10	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		●
11	To maintain and use properly and effectively the facilities that are constructed and the equipment that is provided under the Grant.		●
12	To bear all the expenses, other than those covered by the Grant and its accrued interest, necessary for the purchase of the Components as well as for the agent's fees.		●
13	To ensure environmental and social consideration for the Programme.		●

Annex- 8

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 2nd Preparatory Survey
on the Project for Clean Energy Promotion Using Solar Photovoltaic System in Georgia

In October 2009, the Japan International Cooperation Agency (hereinafter referred to as "JICA") dispatched the 1st Preparatory Survey Team on the Project for Clean Energy Promotion Using Solar Photovoltaic System (hereinafter referred to as "the Project") in Georgia, and through discussion and technical examination of the results of the survey in Japan, JICA selected the two implementation sites.

In order to explain and reconfirm project sites and design of the Project, JICA sent Georgia the 2nd Preparatory Survey Team (hereinafter referred to as "the Team"), which is headed by Mr. Shinji TOTSUKA, Deputy Resident Representative in JICA Uzbekistan office, from 26th November, 2009 to 21st December, 2009.

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

In the course of discussions and field survey, both sides confirmed the main items described in the attached sheets.

Tbilisi, December 15, 2009

for

Yukihiko EJIRI
Chief Representative
Japan International Cooperation Agency
Uzbekistan Office
JAPAN

Gocha MAMATSASHVILI
Deputy Minister
Ministry of Environment Protection and
Natural Resources
GEORGIA

Gigi TEVZADZE
Rector
Ilia Chavchavadze State University
GEORGIA

Archil NIKOLAISHVILI
Deputy Minister
Ministry of Energy
GEORGIA

ATTACHMENT

1. Result of selection of implementation sites

The Japanese side explained that the four candidate sites confirmed in the 1st Preparatory Survey were examined based on the following considerations, and two implementation sites were selected as below.

- Financial viability and cost effectiveness, considering the amount of budget available for the Project.
- Potential for project sustainability, which is a requirement of JICA Grant Aid Projects
- Technical feasibility to install solar photovoltaic system.

Project site	Location	PV capacity
Head office building of the Ministry of Environment Protection and Natural Resources of Georgia	6 Gulua str, 0114,Tbilisi, Georgia	Approximately 80 kW
Ilia Chavchavadze State University	3/5, Kakutsa Cholokashvili Ave., 0162, Tbilisi, Georgia	Approximately 40kW

The capacity and layout PV system will be finalized by the Team based on the result of technical examination which will be conducted until December 20, 2009. The final capacity and layout of PV system is the subject to the approval of the Government of Japan.

The Georgian side understood the result and agreed to implement the Project in the above two sites.

2. Confirmation of Responsible Organization and Implementing Agency

With regard to the implementing agency, in addition to the MOEPNR, Ilia Chavchavadze State University (hereinafter referred to as "the University," whose organization chart is shown in Annex-1.) becomes implementing agency.

As recorded in the Minutes of Discussions dated October 2, 2009, the responsible organization is the Ministry of Environment Protection and Natural Resources of Georgia (hereinafter referred to as the "MOEPNR," whose organization chart is shown in Annex-2.) , and the Ministry of Energy of Georgia shall be responsible for technical assistance to the Project.

3. Preparation of the site

The Georgian side agreed that the site to install solar photovoltaic system shall be allocated by the responsible organization and all necessary arrangement shall be completed by January 31, 2010.

4. Reconfirmation of Minutes of Discussion on the 1st Preparatory Survey

Georgian side reconfirmed the contents of the Minutes of Discussions on the Preparatory Survey on the Project for Clean Energy Promotion Using Solar Photovoltaic System in Georgia signed on October 2, 2009.

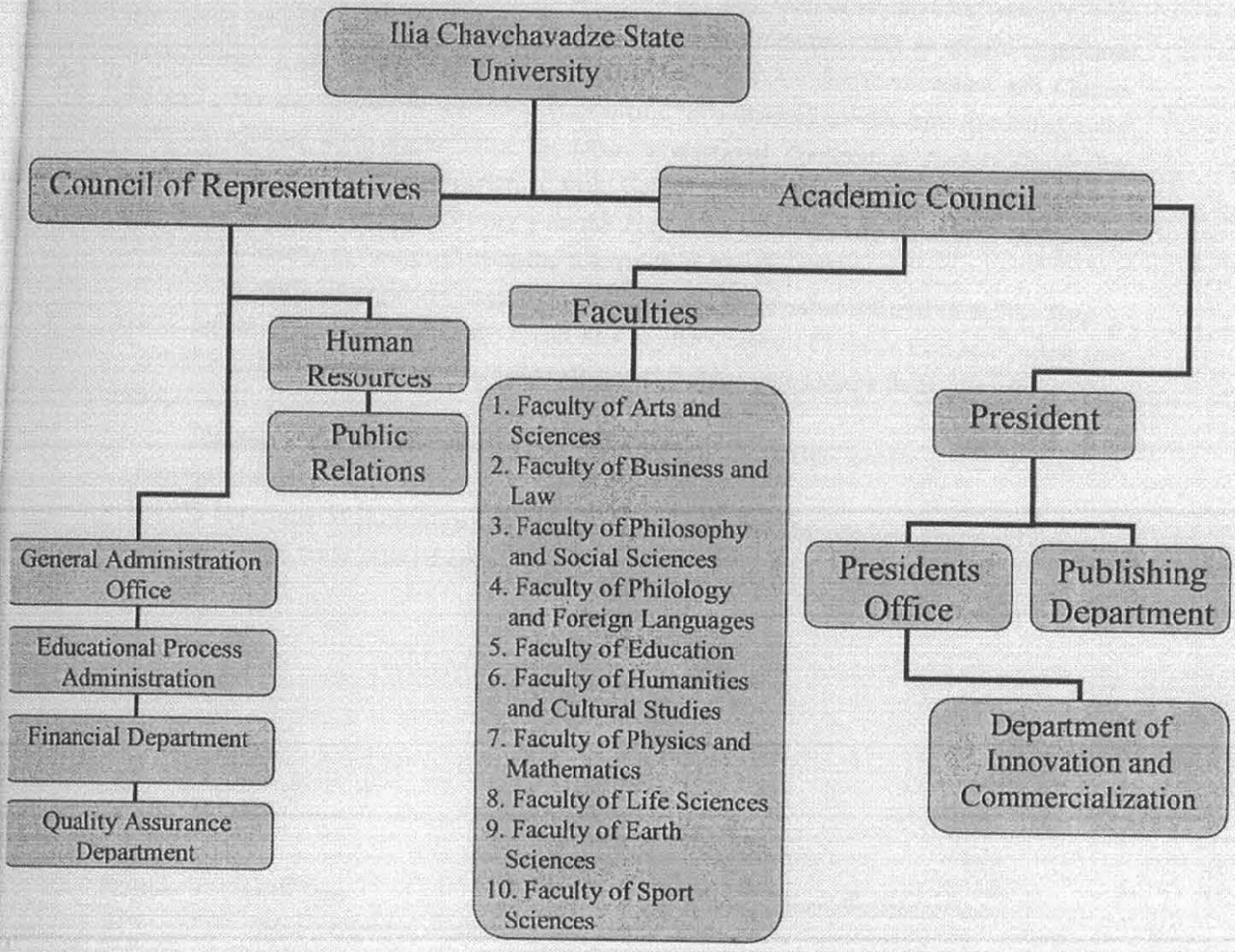
<List of Annex>

Annex-1 Organization Chart of Ilia Chavchavadze State University.

Annex-2 Minutes of Discussions on the Preparatory Survey on the Project for Clean Energy Promotion Using Solar Photovoltaic System in Georgia, October 2, 2009.

(Annex-1)

Organization Chart of Ilia Chavchavadze State University



Minutes of Discussions
on the 3rd Preparatory Survey
on the Project for Clean Energy Promotion Using Solar Photovoltaic System in Georgia

In October and December of 2009, the Japan International Cooperation Agency (hereinafter referred to as "JICA") dispatched the 1st and 2nd Preparatory Survey Team on the Project for Clean Energy Promotion Using Solar Photovoltaic System in Georgia (hereinafter referred to as "the Project"). Through discussion and technical examination of the results of the survey in Japan, JICA selected the two implementation sites. After the 2nd Preparatory Survey, JICA Team got acquainted with an existing basement at the one of the site at the Head Office building of the Ministry of Environment Protection and Natural Resources (hereinafter referred to as "MoEPNR").

In order to explain and confirm a design and layout of the project, JICA sent Georgia the 3rd Preparatory Survey Team (hereinafter referred to as "the Team"), which is headed by Mr. Hiroshi Sumiyoshi, Advisor, Energy and Mining Division, Industrial Development Department, JICA, from 30 August to September 03, 2010.

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

In the course of discussions and field survey, both sides acknowledged confirmed the main items described in the attached sheets.

Tbilisi, October 13, 2010

Hiroshi Sumiyoshi
Leader
Preparatory Survey Team
Japan International Cooperation Agency
JAPAN

George Zedginidze
Deputy Minister
Ministry of Environment Protection and
Natural Resources
GEORGIA

ATTACHMENT

1. Background

After the 2nd Preparatory Survey, JICA Team got acquainted with an existing basement at the one of the site, the Head Office building of the MoEPNR. This basement will influence the design and layout of the construction of PV system which was proposed in the last Preparatory Survey. Therefore, the Team proposed Georgian side to arrange an additional survey (hereinafter referred to as the "additional survey"), or to look for an alternative site.

2. Alternative site

A new project site was proposed, which was an open space (hereinafter referred to as the "New Site") adjacent to the main building of the MoEPNR, between the MoEPNR and Ministry of Interior. The Georgian side also explained that the Ministry of Interior had the title of the New Site, and the MoEPNR would be able to get the title of the New Site for this project after the JICA selects this New Site as the project site.

Both the Team and the Georgian side (hereinafter referred to as the "Both Side") agreed that this New Site would be one option as project site, and would be surveyed its condition by JICA. JICA will inform to the Georgian side the final decision of the Project site. In the case that the New Site could be used for this project, the Team would request the MoEPNR to send the official permission letter to JICA for the New Site as the Project implementation site after the negotiation between the MoEPNR and the Ministry of Interior. The Georgian side agreed to arrange the official permission letter to JICA, and send it through the Embassy of Japan in Georgia. The Georgian side agreed that the Georgian side would clear and level the New Site until the project procurement process in Japan starts. The Team agreed to arrange the drainage system and the substructure for the Solar System in the New Site based on the result of the additional survey.

3. Additional Survey

In the case that the New Site could not be used for this project from any reason, JICA Team explained that it is necessary to reexamine the original plan discussed on December 15, 2009, and an additional survey of the basement would be needed. The Georgian side understood the needs of the additional survey and agreed to implement this survey.

<List of Annex>

Annex-1 Minutes of Discussions on the 1st Preparatory Survey on the Project for Clean Energy Promotion Using Solar Photovoltaic System in Georgia, October 2, 2009.

Annex-2 Minutes of Discussions on the 2nd Preparatory Survey on the Project for Clean Energy Promotion Using Solar Photovoltaic System in Georgia, December 15, 2009.

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

The Government of Japan (hereinafter referred to as "GoJ") has established Cool Earth Partnership as a new financial mechanism. Through this, GoJ 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 GoJ 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 GoJ, decided to conduct a Preparatory Survey (hereinafter referred to as "the Survey") on the Project for Clean Energy Promotion Using Solar Photovoltaic System in Georgia (hereinafter referred to as "the Project").

JICA sent to Georgia the Preparatory Survey Team (hereinafter referred to as "the Team") from September 06 to September 29, 2011.

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

In the course of discussions and field survey, both sides acknowledged confirmed the main items described in the attached sheets.

Tbilisi, September 10, 2011

Hiroshi Sumiyoshi
Director,
Energy and Mining Division,
Industrial Development and Public Policy
Department,Japan International Cooperation
Agency
JAPAN

Vera Kobalia
Ministry of Economy and Sustainable
Development of Georgia

K. Aleksidze
United Airports of Georgia

ATTACHMENT

1. Current Situation

The Government of Georgia recognizes the threat of the Climate Change to the economy and natural ecosystems and therefore considers development and implementation of the Climate Change-related policy and measures as one of its priorities.

The policy of the Government of Georgia on mitigating the Climate Change defines the measures on reducing Green House Gas emissions in various sectors including the energy sector. In this situation, both sides confirm that the Project, which introduces photovoltaic (PV) power generation systems connected with the national power grid, is one of the pilot systems to enhance the possibility of applying renewable energy.

2. Objective of the Project

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

3. Responsible Organization and Implementing Agency

The responsible organization is the Ministry of Economy Development and implementing organization is the United Airports of Georgia (hereinafter referred to as the "UAG," whose organization chart is shown in Annex-1.) and Ilia University.

4. Items Requested by the Government of Georgia

4-1. After discussions with the Team, the installation of the on-grid power generating system using PV including following equipment was requested by the Georgian side.

(1) Solar module (panel)
(2) Junction Box
(3) Power Conditioner
(4) Transformer
(5) Data collecting and display device

4-2. The Georgian side and the Team agreed that project site is a parking area which is in front of the main terminal of the Tbilisi International Airport and campus of Ilia University.

4-3. The Georgian side explained that there is no duplication between requested contents of the Project and any other plans implemented by the other donors or the Georgian side.

4-4. The Georgian side has understood that the final component and the design of the Project shall be determined (confirmed) at the timing of 2nd phase of the Preparatory Survey.

4-5. The Team will report the findings and items requested by the Georgian side to JICA Headquarters and the GoJ.

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

The Georgian side understood the Japan's Program Grant Aid for Environment and Climate Change scheme explained by the Team, as described in Annex-3, 4, 5 and 6.

6. Schedule of the Study

6-1. The Team will proceed to further survey in Georgia until the end of September as the 1st phase of the Preparatory Survey. Additional survey might be conducted as the 1st phase of the Preparatory Survey, if necessary.

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

7. Other Relevant Issues

7-1 Major Undertakings to be taken by the Georgian side

The Georgian side confirmed that major undertakings as shown in Annex-7 should be taken by the Georgian side at its own expense. In addition, the Georgian side should be responsible for the following issues;

(1) Securing necessary site

- for PV Modules
- for underground cables between PV Modules and Power Conditioners
- for Power Conditioners

(2) Temporary Stockyard during installation of the equipment and materials

(3) Tables and PCs, if necessary

7-2 Preparation of the site

The Georgian side agreed that the site 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.

7-3 Procurement of Equipment

The Team explained that, in accordance with the policy of GoJ, products of Japan shall be procured for major equipment in the Project. The Georgian side understood/agreed.

7-4 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 Georgian side agreed to establish a consultative committee in order to coordinate with the Japanese side which consists of the Embassy of Japan, JICA Programme Coordinator (or JICA representative) in Georgia and the procurement agency. The terms of Reference of the Consultative Committee is referred to Annex-8.

7-5 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.

7-6 Applying JICA Environmental and Social Considerations Guideline

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

7-7 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.

7-8 Customs and Tax exemption

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

7-9. The Georgian side shall ensure the security of all concerned Japanese nationals working for the Project, if deemed necessary.

7-10. The Georgian side shall provide necessary numbers of counterpart personnel to the Team during the period of their studies in Georgia.

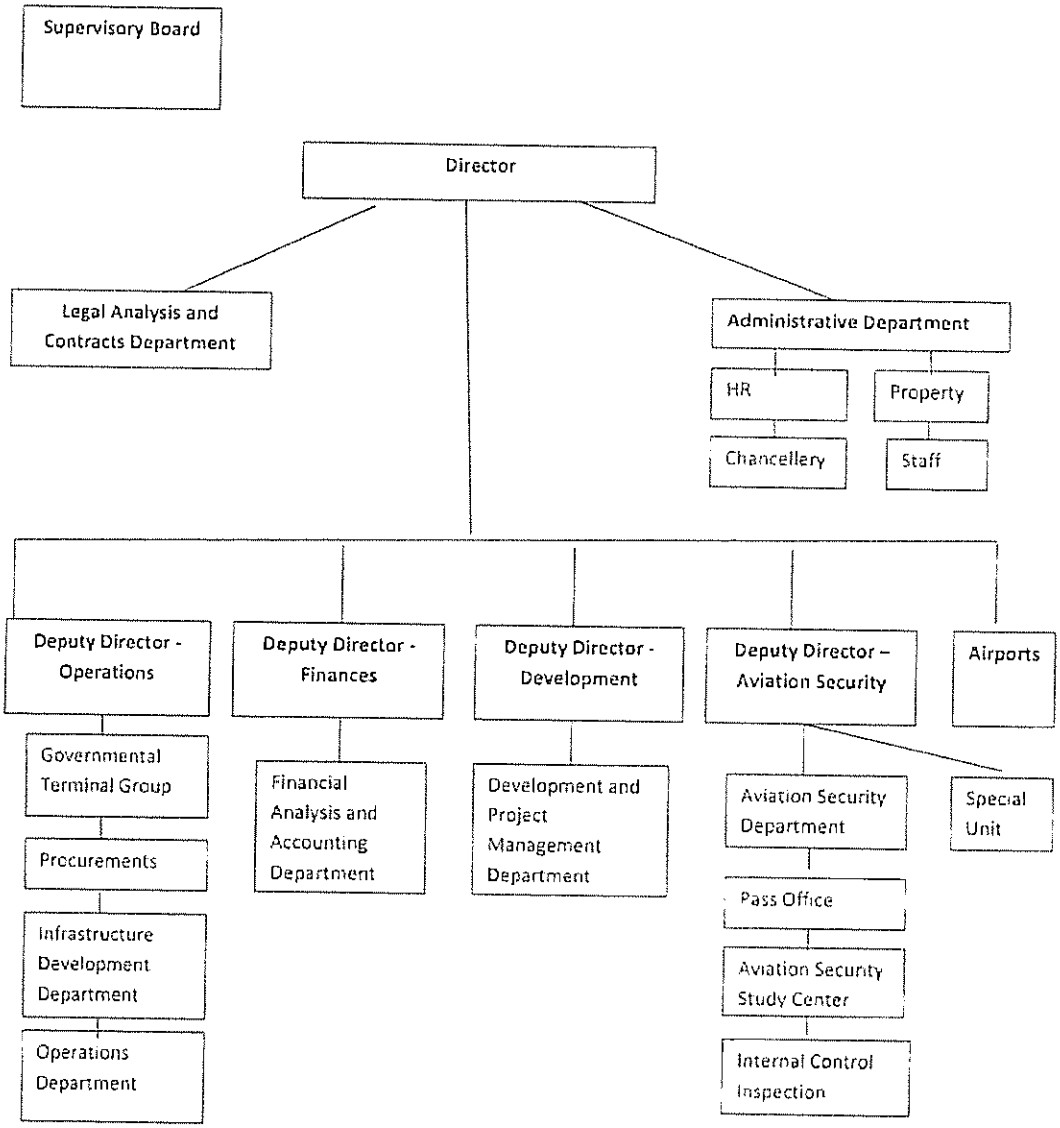
7-11 The Georgian side shall submit all the answers to the Questionnaire, which the Team handed to the Georgian side.

<List of Annex>

Annex-1 Organization Chart of United Airports of Georgia
Annex-2 Project site / Candidate site of the Project
Annex-3 Program Grant Aid for Environment and Climate Change (Provisional)
Annex-4 General Flow of Program Grant Aid for Environment and Climate Change
Annex-5 Flow of Funds for Project Implementation
Annex-6 Project Implementation System
Annex-7 Major Undertakings to be taken by each Government (Provisional)
Annex-8 Terms of References of the Consultative Committee (Provisional)

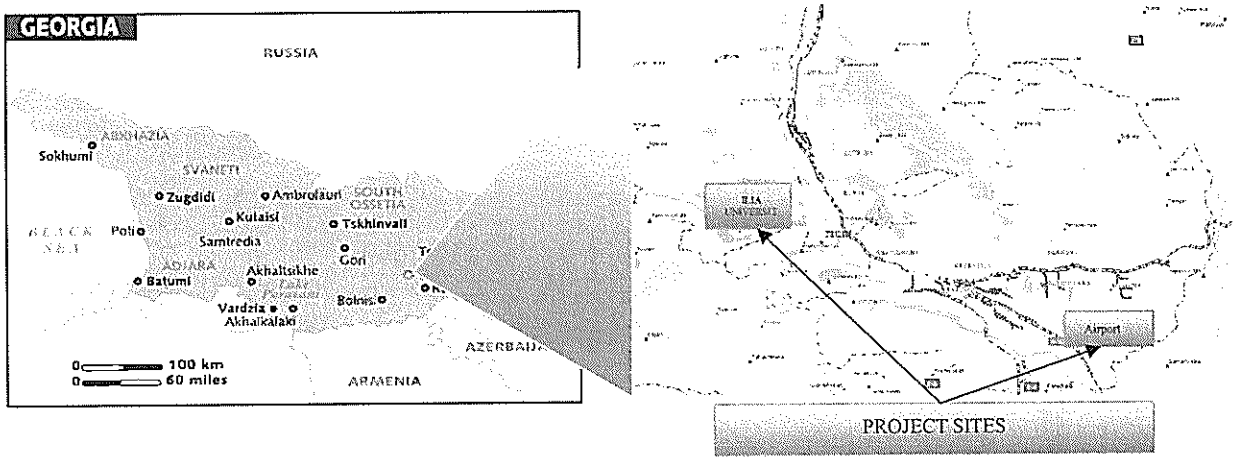
Annex – 1

Organization Structure of United Airports of Georgia LTD.



Annex-2

Project site / Candidate site of the Project



Candidate site	Address
United Airports of Georgia	Chanturia st. 12, Tbilisi, Georgia
Ilia Chavchavadze State University	5, Kakutsa Cholokashvili Ave., Tbilisi 0162, Georgia

Annex – 3

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 reffered 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) Selection of firms

In principle, firms of any nationality could be contracted as long as the firms satisfy the conditions specified in the tender documents.

The same applies for any individual consultants who will be involved in the Project and provide services necessary for the training and guidance related to the Project.

The consultants that will be employed to do detail design and supervise the work for the Project, however will be in principle, Japanese nationals recommended by JICA for the purpose of maintaining technical consistency with the Study.

g) 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.

h) 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.

i) 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.

j) 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.

k) 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.

m) 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:

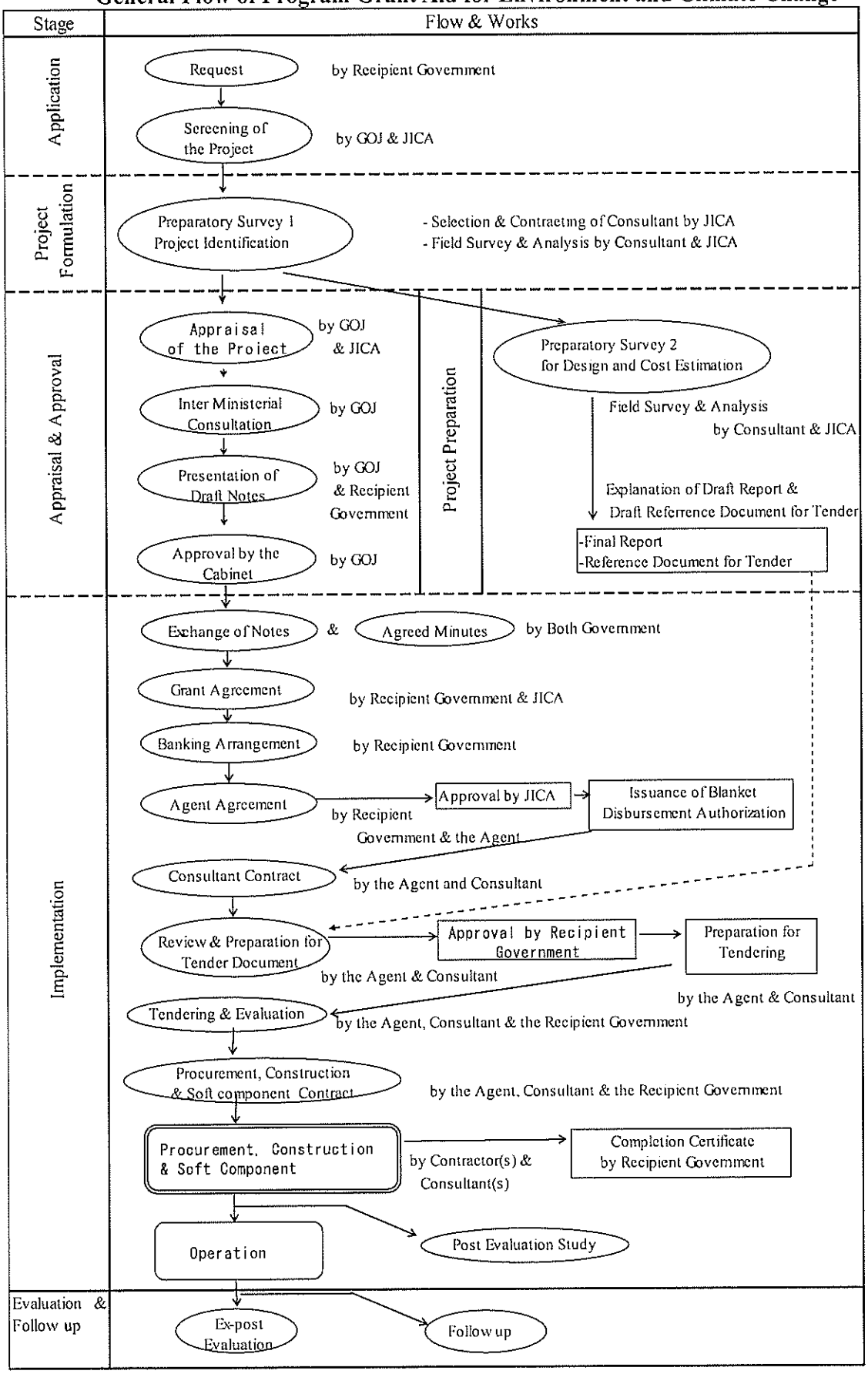
a) To secure land necessary for the sites of the Project and to clear, level and reclaim the land prior to commencement of the Project.
b) To provide facilities for distributing electricity, water supply and drainage and other incidental facilities in and around the sites.
c) To ensure all the expense 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.

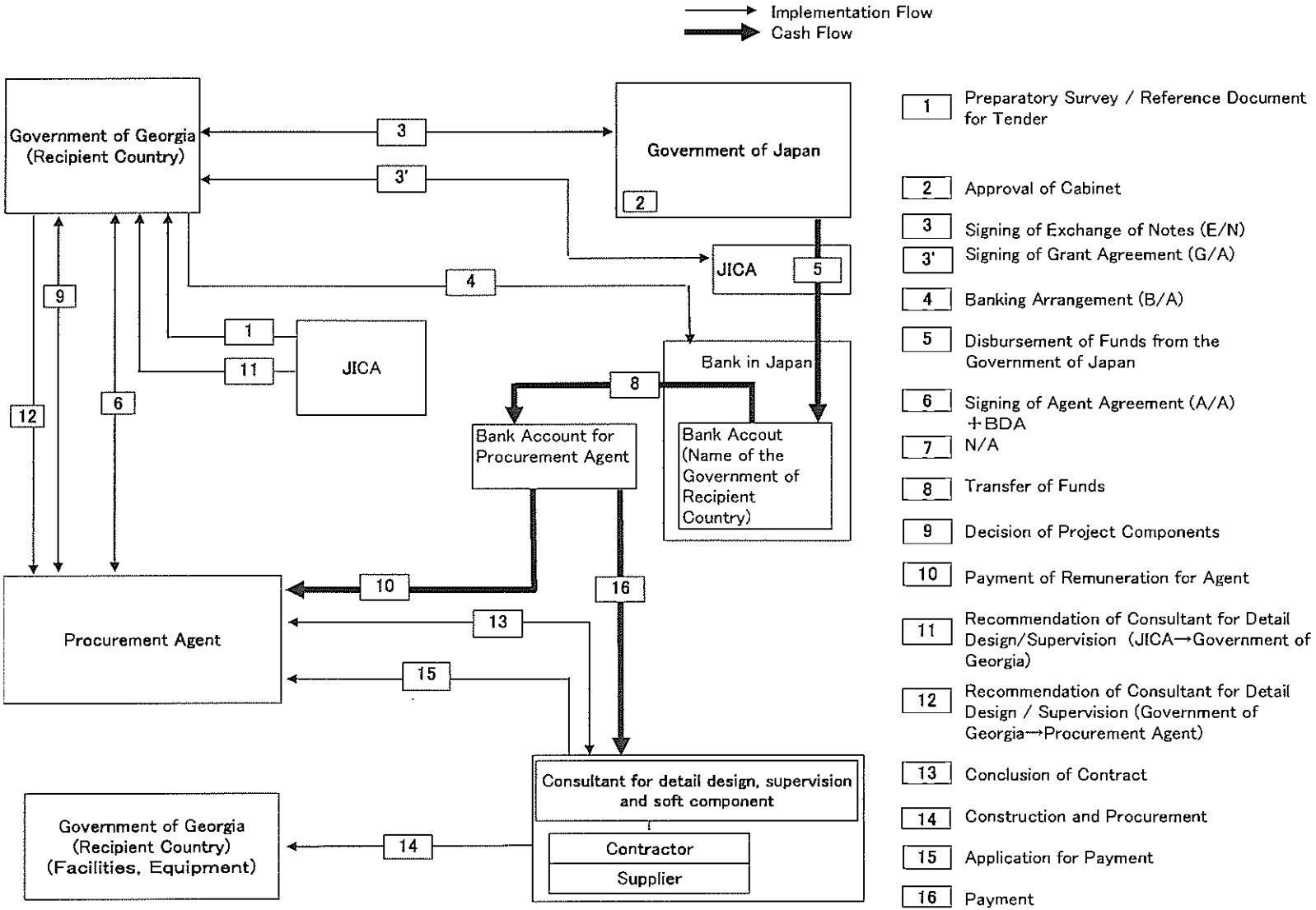
6) "Export and Re-export" of products
The products purchased under the Grant and its accrued interest will not be exported or re-exported from the Recipient.

Annex-4

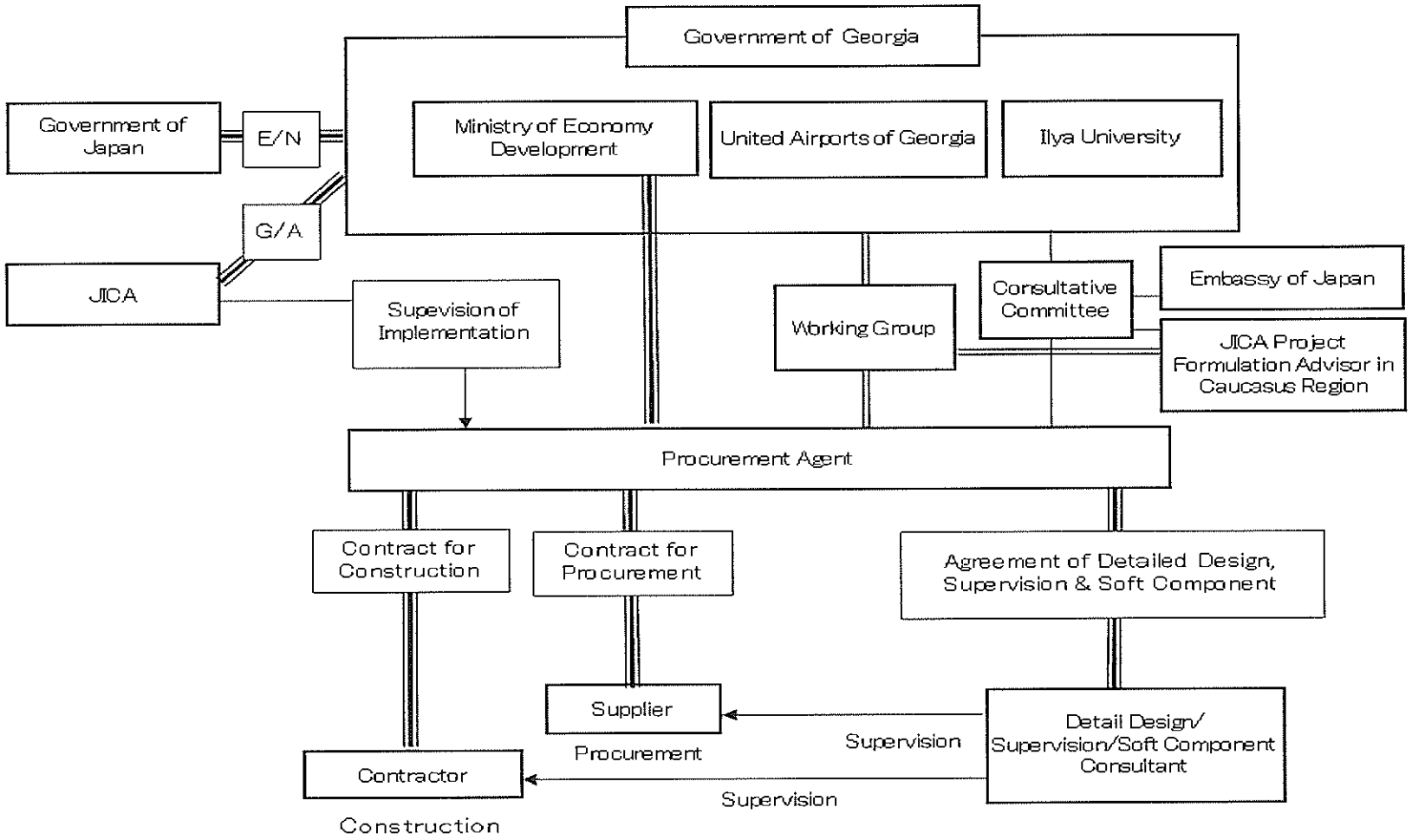
General Flow of Program Grant Aid for Environment and Climate Change



Flow of Funds for Project Implementation



Project Implementation System



Annex-7

Major undertakings to be taken by each Government (Provisional)

No.	Items	To be covered by Grant Aid	To be covered by Recipient Side
1	To secure site		●
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 roads		
	1) Within the site	●	
	2) Outside the site and Access road		●
5	To construct the facility and install the equipment	●	
6	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	●	
7	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		●
8	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	●	
9	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.		●
10	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		●
11	To maintain and use properly and effectively the facilities that are constructed and the equipment that is provided under the Grant.		●
12	To bear all the expenses, other than those covered by the Grant and its accrued interest, necessary for the purchase of the Components as well as for the agent's fees.		●
13	To ensure environmental and social consideration for the Programme.		●

Annex- 8

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
ou the Preparatory Survey
on the Project for Cleau Energy Promotion Using Solar Photovoltaic System
in Georgia
(Explanation on Draft Final Report)

From September 2009 to September 2011, 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 in Georgia (hereinafter referred to as "the Project"), 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 Georgia on the component of the Draft Final Report, JICA dispatched to Georgia the Preparatory Survey Team for Draft Final Report Explanation (hereinafter referred to as "the Team"), which is headed by Mr. Hiroshi Sumiyoshi, Director of JICA Headquarters Office, from February 27th to March 3rd, 2012.

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

Tbilisi, March 1st, 2012

Hiroshi Sumiyoshi
Director,
Energy and Mining Division,
Industrial Development and Public Policy Department,
Japan International Cooperation Agency

Vera Kobalia
Minister,
Ministry of Economic and Sustainable Development of Georgia

K. Aleksidze
Director,
United Airports of Georgia

Gigi Tevzadze
Rector
Ilia State University

ATTACHMENT

1. Components of the Draft Final Report

The Georgian 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 Georgian side understood components of the Minutes of Discussion signed by both sides on October 2nd, 2009 and 10th September, 2011 (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-3, 4, 5, 6 and 7.

3. Schedule of the Study

JICA will complete the final report in accordance with the confirmed items and send it to Ministry of Economic and Sustainable Development of Georgia (hereinafter referred to as "MOE"), United Airport of Georgia (hereinafter referred to as "UAG"), and Ilia State University (hereinafter referred to as "ISU") by August 2012.

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

4.1. Project site and capacity of Solar Photovoltaic system

Both sides confirmed that project sites are Tbilisi International Airport and Ilia State University. The Team explained that the design capacity of Solar Photovoltaic (PV) systems (hereinafter referred to as " PV system") to be procured and installed in Tbilisi International Airport would be 310kW and in Ilia State University 37kW 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 the Georgian side agreed to obtain the permission to install the PV system and to have it connected to the national grid. It was also confirmed by both sides that UAG and ISU shall obtain the permission of the TELASI for the installation and operation of the PV system to be connected to the national grid by September 2012.

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 From September 2009 to September 2011. After discussion, both side confirmed that the major equipment such as PV modules consist of PV cells and Power Conditioners should be produced and purchased in Japan, while products of third country could be acceptable for other type of equipment as a part of components.

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 PC programs of utilization of power generating and meteorological data from the PV system

7. Ownership and Responsibilities for Operation and Maintenance

The Georgian side has reconfirmed that UAG and ISU are respectively the owner of the each equipment for the PV system to be procured by the Project, and UAG and ISU are responsible for Operation and Maintenance (O&M) of these equipment.

The Georgian side confirmed that the estimated cost for O&M described in Annex 2 and agreed that UAG and ISU will respectively secure necessary budget and assign necessary personnel for the O&M of the PV system procured and installed under the Project.

8. Procurement Process of the Project

Both sides reconfirmed that procurement process would be supervised by the Procurement Agent (hereinafter referred to as "the Agent") who is recommended by the government of Japan through necessary consultation with the Consultative Committee (hereinafter referred to as "the Committee"). Both sides also reconfirmed the roles of the Agent as follows;

(1) The Agent will render the services stipulated in the provisions of the Grand Agreement (G/A) as well as the Exchange of Notes (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 undertake 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 Georgian 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 Georgian 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.

9. Project Cost

The Georgian side agreed that the Project cost of grant part should not exceed the upper limit of grant 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 Georgian 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.

10. Confidentiality of the Project

1) Detailed specifications of the Facilities and Equipment

Both sides confirmed that all the information related to the Project should 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 of the facilities and equipment, and other technical information of the facilities and equipment;

b) the Draft Final Report;

c) the Final Report

2) Confidentiality of the Cost estimation

The Team explained the estimated cost of the project as described in Annex 2. The Georgian side agreed that the estimated cost of the Project should never duplicated or disclosed to any outside parties (i.e. outside of JICA, the Georgian side and the Agent) before tender for the project. The Georgian side understood that the estimated cost for the Project attached as Annex 2 is not final and is subject to change as a result of examination through revision of the Outline Design Study.

11. The Consultative Committee

The Georgian side agreed that the MOE would chair the Committee in order to facilitate consultation and procurement process. The Terms of Reference of the Committee was settled in Annex-8.

The members of the Committee are as follows:

(1) Representative of MOE (Chair)
(2) Representative of Ministry of Foreign Affairs of Georgia
(3) Representative of UAG
(4) Representative of ISU
(5) Representative of TELASI
(6) Representative of TAV
(7) Representative of the Embassy of Japan
(8) Representative of JICA Uzbekistan Office

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

Further meetings shall be held upon request of either the Georgian side or the Japanese side. The Agent may advise JICA and the Georgian side on the necessity to call a meeting of the Committee.

12. Undertakings required by the Recipient Country

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

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

The owners of the land where the following equipment and materials for PV system will be installed are respectively UAG and ISU. UAG and ISU had already agreed to offer their lands for the installation of the system. for PV Modules

1) for Cables between Equipment
2) for Power Conditioners
3) for Electric Substation
4) for Data Management and Monitoring System
5) for Temporary Stockyard

(2) Preparation for the Site

UAG and ISU shall clear and level the space for PV system installation as the preparation of the site by September 2012.

(3) Construction permissions

Both sides confirmed that UAG and ISU should obtain building permission of the Municipality for the supporting structure of the PV system by November 2012.

(4) Assignment of Counterpart Personnel

1) Overall project management

The Georgian side assigned following personnel for overall project management and coordination in each organization.

UAG: Mr. Nodar Lominadze, Deputy Director of United Airports of Georgia

ISU: Mr. Kakha Karchkhadze, Department Chair, Department of Innovation and Commercialization

2) Soft Component

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

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

- UAG
- ISU
- TELASI
- TAV

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

(5) Customs and Tax Exemption

Based on the previous M/D, the Georgian side agreed that Georgian side shall be responsible for the exemption of all customs, tax, levies and duties incurred in Georgia for implementation of the project.

(6) Environmental and Social Considerations

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

The Georgian side shall obtain an official statement from the Ministry of Environment Protection of Georgia that EIA and IEE are not required for the project.

<List of Annex>

Annex-1 List of Major Equipment

Annex-2 Project Cost Estimation (Confidential)

Annex-3 Program Grant Aid for Environment and Climate Change of the Government of Japan (Provisional)

Annex-4 General Flow of Program Grant Aid for Environment and Climate Change

Annex-5 Flow of Funds for Project Implementation

Annex-6 Project Implementation System

Annex-7 Major Undertakings to be taken by each Government (Provisional)

Annex-8 Terms of References of the Consultative Committee (Provisional)

Annex-1

List of Major Equipment

List of Major Equipment (Tbilisi International Airport)

Equipment		Quantity
Grid-connected Photovoltaic System		1 system
	1-1. Photovoltaic (PV) Module	310 kW
	1-2. Supporting structure for PV modules	1 set
	1-3. Power Conditioners	1 set
	1-4. Junction box	1 set
	1-5. Grid connecting board	1 set
	1-6. Power factor improvement static capacitor 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 Maintenance equipment	1 set

List of Major Equipment (Ilia State University)

Equipment		Quantity
Grid-connected Photovoltaic System		1 system
	1-1. Photovoltaic (PV) Module	37 kW
	1-2. Supporting structure for PV modules	1 set
	1-3. Power Conditioners	1 set
	1-4. Junction box	1 set
	1-5. Grid connecting board	1 set
	1-6. Electric substation	1 set
	1-7. Data management and monitoring system	1 set
	1-8. Data management and monitoring system for education	1 set
	1-9. Meteorological observation instruments	1 set
	1-10.Large display	1 set
	1-11 Maintenance equipment	1 set

Annex-2

非公開

非公開

Annex – 3

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.
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- 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) Selection of firms

In principle, firms of any nationality could be contracted as long as the firms satisfy the conditions specified in the tender documents.

The same applies for any individual consultants who will be involved in the Project and provide services necessary for the training and guidance related to the Project.

The consultants that will be employed to do detail design and supervise the work for the Project, however will be in principle, Japanese nationals recommended by JICA for the purpose of maintaining technical consistency with the Study.

g) 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.

h) 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.

i) 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.

j) 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.

k) 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.

m) 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.

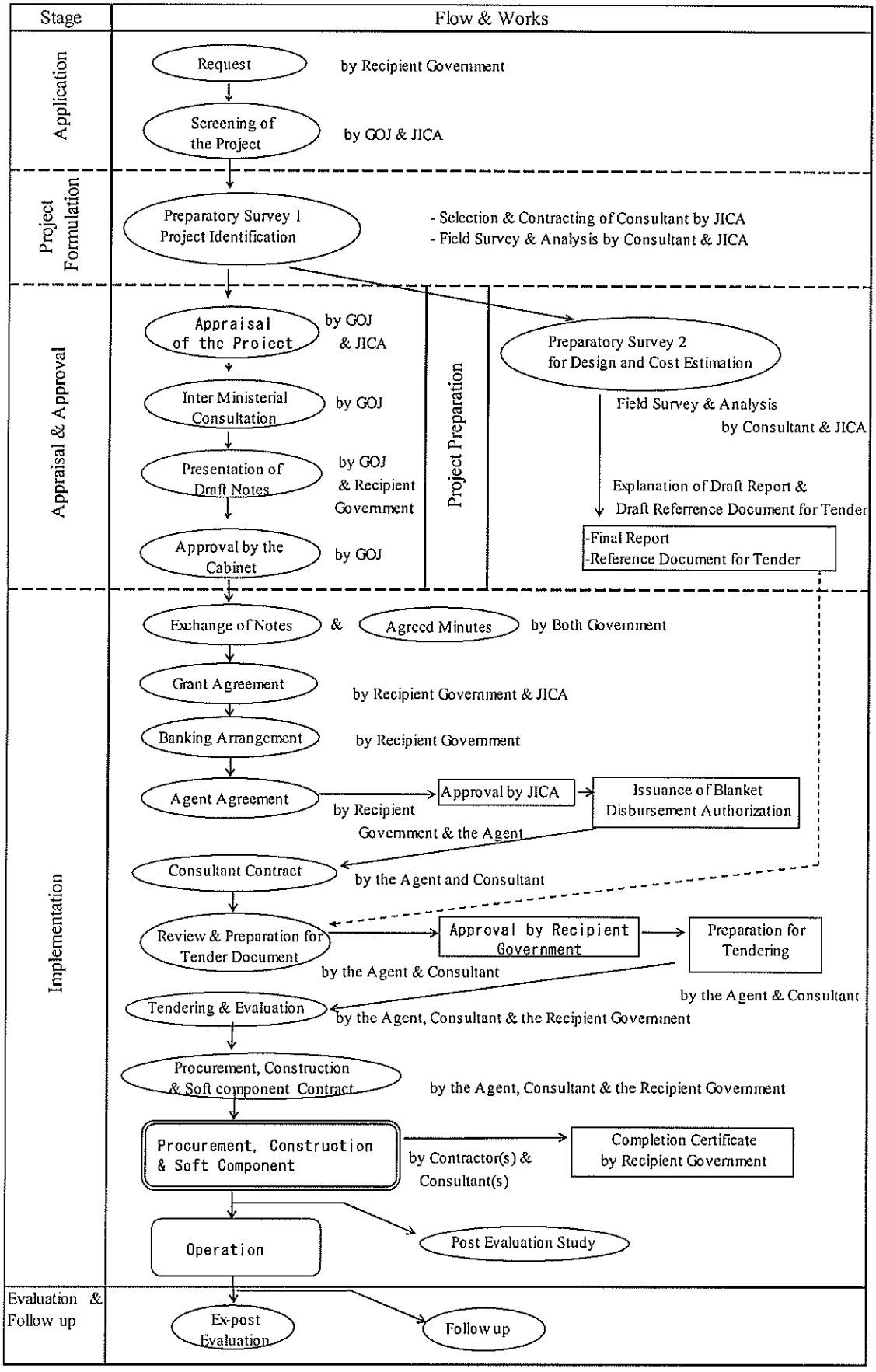
5) "Proper use of funds"

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.

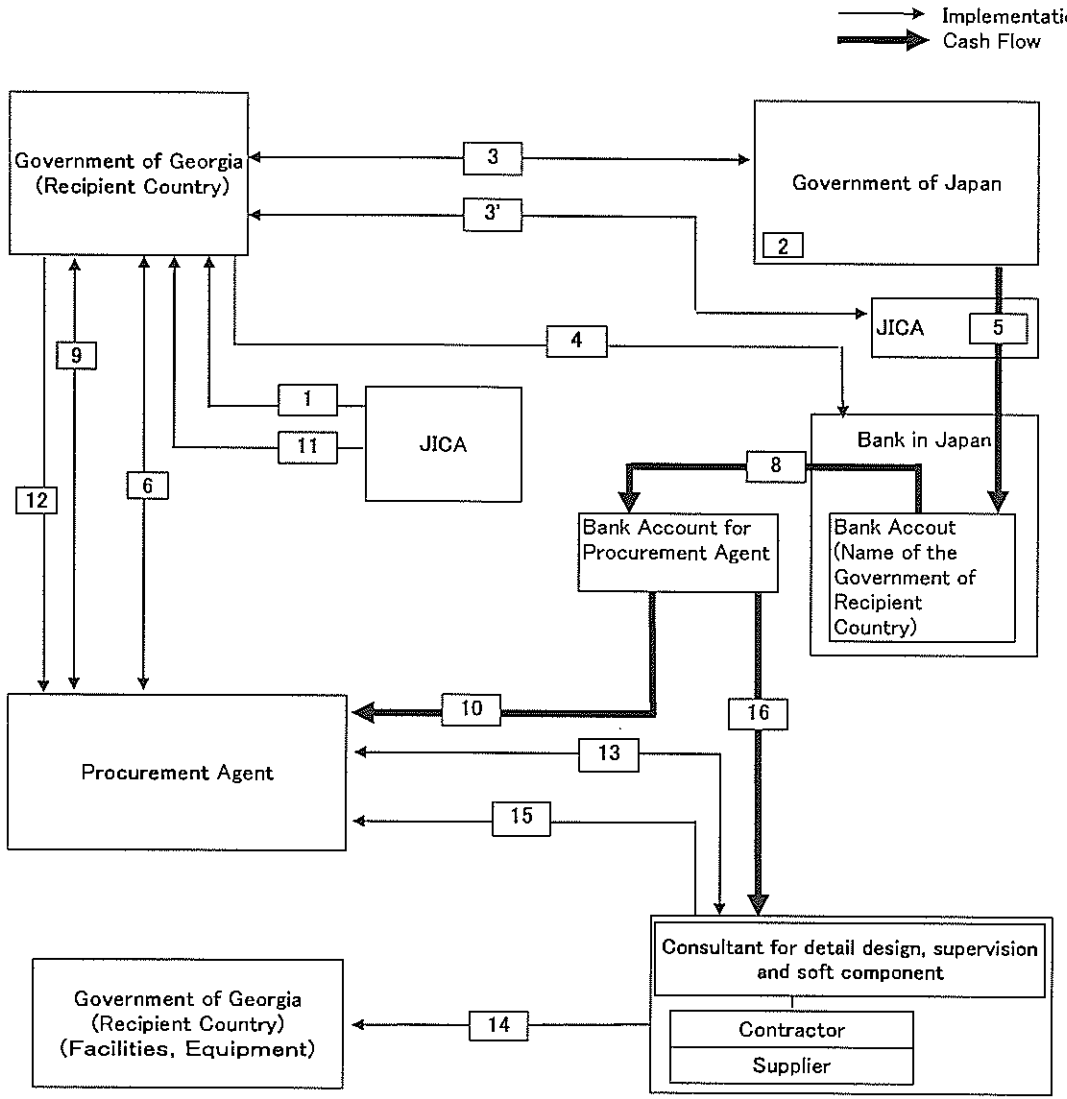
6) "Export and Re-export" of products

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

Annex-4 **General Flow of Program Grant Aid for Environment and Climate Change**



Flow of Funds for Project Implementation



1 Preparatory Survey / Reference Document for Tender
2 Approval of Cabinet
3 Signing of Exchange of Notes (E/N)
3' Signing of Grant Agreement (G/A)
4 Banking Arrangement (B/A)
5 Disbursement of Funds from the Government of Japan
6 Signing of Agent Agreement (A/A) +BDA
7 N/A
8 Transfer of Funds
9 Decision of Project Components
10 Payment of Remuneration for Agent
11 Recommendation of Consultant for Detail Design/Supervision (JICA→Government of Georgia)
12 Recommendation of Consultant for Detail Design / Supervision (Government of Georgia→Procurement Agent)
13 Conclusion of Contract
14 Construction and Procurement
15 Application for Payment
16 Payment

Annex-6

Project Implementation System

Annex-7

Major undertakings to be taken by each Government (Provisional)

No.	Items	To be covered by Grant Aid	To be covered by Recipient Side
1	To secure site		●
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 roads		
	1) Within the site	●	
	2) Outside the site and Access road		●
5	To construct the facility and install the equipment	●	
6	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	●	
7	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		●
8	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	●	
9	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.		●
10	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		●
11	To maintain and use properly and effectively the facilities that are constructed and the equipment that is provided under the Grant.		●
12	To bear all the expenses, other than those covered by the Grant and its accrued interest, necessary for the purchase of the Components as well as for the agent's fees.		●
13	To ensure environmental and social consideration for the Programme.		●

Annex- 8

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.

資料５．事業事前計画表（概略設計時）

事業事前計画表（概略設計時）

1. 案件名

太陽光を活用したクリーンエネルギー導入計画準備調査（グルジア国）
（ファスト・トラック制度適用案件）

2. 要請の背景（協力の必要性・位置付け）

(1) グルジア国（以下「グ」国という）の、過去 3 年間の電力需要の伸びは 8,744GWh（2010 年）、7,907GWh（2009 年）、8,411GWh（2008 年）と概ね横ばいであるが、近年のパイプライン損傷事故等の外部要因に備えて安定的に電力を供給するため、需要に見合った計画的な発電設備の整備が喫緊の課題となっている。

(2) 気候変動対策については、「グ」国は、気候変動枠組条約批准国及び京都議定書批准国の非附属書 I 国に属し、温室効果ガス削減のための政策を推進している。

(3) 一方、日本は温室効果ガスの排出削減と経済成長を両立させ、気候の安定化に貢献しようとする国に対し、「クールアースパートナーシップ」（2008 年 1 月）を発表した。この中で、排出削減と経済成長を両立させる実行能力や資金が不足している国の支援を目的とした環境プログラム無償資金協力事業が導入された。

(4) このような背景から、クールアースパートナー国であり、急激な電力需要増に対応しつつ環境負荷軽減を目指すために急ピッチで再生可能エネルギー開発を進めていく方針を掲げている「グ」国が、日本国政府に太陽光発電システムの導入を環境プログラム無償資金協力として要請され、かかる協力準備調査の実施が承認された。本プロジェクトは、日本の環境プログラム無償資金協力事業を活用して系統連系型太陽光発電システムを導入し、太陽エネルギーに恵まれた「グ」国での太陽光発電事業の拡大、促進及び温室効果ガスの排出量の削減に貢献することを目標とする。

3. プロジェクト全体計画概要

(1) プロジェクト全体計画の目標(裨益対象の範囲及び規模)

① 系統連系型太陽光発電システムに対し、トビリシ国際空港において渡航者（82 万人）や駐車場利用者（最大 370 人）およびイリア国立大学において年間車両運行（655 万台）や教授（200 人）、研究者（110 名）、学生（8,000 人）へのショーケース効果が得られる。

② 系統連系型太陽光発電システムにより CO_2 が年間約 200 t 削減される。

《裨益対象の範囲及び規模》

直接受益者：トビリシ国際空港、イリア国立大学

利用者：トビリシ国際空港利用者やスタッフ及びイリア国立大学の教授、研究者、学生

間接受益者：グルジア国全国民：

(2) プロジェクト全体計画の成果

① 系統連系型太陽光発電システムが調達・整備される。

② 導入システムに対して、プロジェクト運営維持管理体制が整備される。

(3) プロジェクト全体計画の主要活動

① 系統連系型太陽光発電システムに係る機材が調達・整備される。

② 上記システムを既存の配電網に系統連系する。

③ 運営維持管理体制が構築される。

④ 上記システムの運営維持管理に係る技術支援が行われる。

(4) 投入（インプット）

① 日本側（=本案件）：施工・調達業者契約認証まで非公表

② 相手国側

（ア） 運営維持管理要員の確保：トビリシ空港管理会社 3 名、空港ターミナルビル運営管理会社 5 名、イリア国立大学 10 名、TELASI（配電会社）10 名

（イ） 既存の木の切断（イリア国立大学）
（ウ） 既存塀の撤去（イリア国立大学）
（エ） 既存引込ケーブルの接続替え工事費（イリア国立大学）
（オ） セキュリティカメラの設置（イリア国立大学）

(5) 実施体制
責任機関：経済開発省
実施機関：トビリシ国際空港管理会社、イリア国立大学

4. 無償資金協力案件の内容

(1) サイト
グルジア国トビリシ市

(2) 概要
① トビリシ国際空港及びイリア国立大学敷地内において、系統連系型太陽光発電システムに係る機材の調達・整備
② 上記システムの維持運営管理を行うトビリシ国際空港管理会社、イリア国立大学及び TELASI（配電会社）の要員を対象に、太陽光発電システム、系統連系、及びシステムより得られたデータの活用に関する技術指導

(3) 相手国側負担事項
① 運営維持管理要員の確保：グルジア空港管理会社 3 名、空港ターミナルビル運営管理会社 5 名、イリア国立大学 10 名、トビリシ地区配電会社（TELASI）10 名
② 既存の木の切断（イリア国立大学）
③ 既存引込ケーブルの接続替え工事
④ 既存塀の撤去（イリア国立大学）
⑤ 既存引込ケーブルの接続替え工事費（イリア国立大学）
⑥ セキュリティカメラの設置（イリア国立大学）

(4) 概算事業費
概算事業費：「グ」国側負担約 12,365Lari

(5) 工期
実施設計・入札・ソフトコンポーネントの期間を含め 10 ヶ月

(6) 貧困、ジェンダー、環境及び社会面の配慮
特になし

5. 外部要因リスク

地球温暖化等による日射量の変化

6. 過去の類似案件からの教訓の活用

特になし

7. プロジェクト全体計画の事後評価に係る提案

(1) プロジェクト全体計画の目標達成を示す成果指標

	現　状 (2010 年)	プロジェクト 実施後（2015 年）	備　考
トビリシ国際空港の年間渡航者数	-	年間延べ 82 万人	系統連系型太陽光発電システムのショーケース効果
イリア国立大学の大学職員、学生数	-	8,300 人	
系統連系型太陽光発電システムによる発電量	0	年間 361,000kWh	CO2 削減量計算に必要な数値

(2) 評価のタイミング
2015 年以降（機材運用開始後２年経過後）

資料６．ソフトコンポーネント計画書

独 立 行 政 法 人 国 際 協 力 機 構

グルジア国

太陽光を活用したクリーンエネルギー導入計画

協力準備調査

ソフトコンポーネント計画書

2012 年 3 月

株 式 会 社　オリエンタルコンサルタンツ

目　次

1. ソフトコンポーネントを計画する背景

1.1. プロジェクトの背景

グルジア国（以下、「グ」国）では、気候変動による生態系の破壊、気象災害に伴う物的・人的・社会的被害の増加等の懸念から、気候変動への対策を政策の最優先課題の一つとして位置づけている。1994 年に非附属国 I 国として気候変動枠組条約[1]に続き 1999 年には京都議定書に批准し、1996 年から気候変動に対する国家政策が開始され、その政策に基づき国家気候リサーチセンターが設立された。2003 年 1 月には環境省に属していた気候変動庁がクリーン開発メカニズム[2]に関する「グ」国政府の窓口である Designated National Authority （DNA）に指名され、その後移管されて、2005 年 1 月より環境保全・天然資源省（現環境省）が新しい DNA となった。

気候変動対策については、「気候変動に適応したアクション･プランの実施（National Adaptation Plan of Action : NAPA）」（2009 年策定）の中で、「気候変動緩和策の推進」、「CDM スキームの活用」、「気候変動に対する民意の向上」の方針を掲げ、特にエネルギー分野においては、再生可能エネルギー（水力、風力、太陽光、地熱及びバイオマス）の活用促進を目指している。

一方、我が国は温室効果ガスの排出削減と経済成長を両立させ、気候の安定化に貢献しようとする国に対し、「クールアースパートナーシップ」（2008 年 1 月）を発表した。この中で、排出削減と経済成長を両立させる実行能力や資金が不足している国の支援を目的とした環境プログラム無償資金協力事業が導入された。

このような背景の中、我が国が太陽光発電等を活用した環境プログラム無償資金協力事業に関するニーズ調査をクールアースパートナーシップ国である「グ」国に行った。その結果、「グ」国から系統連系型の太陽光発電システムの導入の要請を受けて、対象サイトであるトビリシ国際空港及びイリア国立大学への協力準備調査を実施する運びとなった。

本プロジェクトは、太陽エネルギーに恵まれた「グ」国での太陽光発電事業の拡大、促進及び温室効果ガスの排出量の削減に貢献することを目標とする。

上記目標を達成するために、系統連系型太陽光発電システムの機材整備を行うとともに、運営維持管理のための技術支援（ソフトコンポーネント）を行う。なお、逆潮流については、本プロジェクト終了後、制度が整い次第「グ」国側にて実施したいとの意向であることから、それに関わる機材整備及び技術支援も含むものとする。

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[1] United Nations Framework Convention on Climate Change (UNFCCC)：地球温暖化問題に対する国際的な枠組みを設定した条約。国連の下に大気中の温室効果ガスの濃度を安定化させることを究極の目標とする。

[2] Clean Development Mechanism(CDM)： 京都議定書に規定される温室効果ガスの削減を補完するひとつ。

表 1　本プロジェクトによる支援計画

系統連系型太陽光発電システム機材一式		
機材名	用　途	必要性
系統連系型太陽光発電システム	既存の配電網に系統連系し、太陽光を利用して発電した電力を、施設に供給する。	気候変動による生態系の破壊、気象災害に伴う物的・人的・社会的被害の増加等の懸念から、再生可能エネルギーの推進が求められている。
太陽光発電にかかる技術支援（ソフトコンポーネント）		
技術支援	系統連系型太陽光発電システムに関する基礎知識および保守点検、緊急時の対応等の運営維持管理に関する技術指導を行う。	「グ」国は、系統連系型太陽光発電システムの導入経験が殆どなく、同システムに関する知識および運営・維持能力が不足していることから適切な技術指導が必要である。

表２　トビリシ国際空港 計画概要

責任機関	経済開発省
実施機関	グルジア空港管理会社
設置場所	トビリシ国際空港ターミナルビル前駐車場及び駐車場脇空地
立地環境	トビリシ市内中心部より東へ約 20km
土地所有権	グルジア空港管理会社
使用許可	グルジア空港管理会社
発電容量	約 310kW 以上
想定年間発電量	約 329,000kWh
設置面積	約 4,100 ㎡
電力の使途	空港ターミナルビルの一般電力
想定 CO2 削減量	182.594t/年

表３ イリア国立大学 計画概要

責任機関	経済開発省
実施機関	イリア国立大学
設置場所	イリア国立大学構内
立地環境	グルジアの首都トビリシ市内の中心地周辺
土地所有権	イリア国立大学
使用許可	イリア国立大学
発電容量	約 37kW
想定年間発電量	約 32,000kWh
設置面積	約 420 ㎡
電力の使途	大学構内の一般電力
想定 CO_2 削減量	17.76t/年

1.2.　ソフトコンポーネント実施の必要性

本プロジェクトによって導入される系統連系型太陽光発電システムは、グルジア空港管

理会社(UAG)職員、空港ターミナルビル運営管理会社職員及びイリア国立大学職員にとって運用した経験が無いため、その導入に際して、適切な維持管理に係る事項のみならず、事故時の対応を含めた系統連系運用に関する知識や手順についても、関係者が熟知・熟練する必要がある。また、収集される電力データや関連気象データの整理、編集、処理からその活用に至る作業の流れも新たに構築することが必要である。

太陽光発電システムを、系統連系により安定かつ安全な運用を行うためには、当該地区を給電エリアとしているトビリシ地区配電会社である（TELASI）との密接な連携が必要不可欠である。TELASI は、これまでトビリシ地区に安定的に電気を供給していることから、配電に関する知識、技術及び運営維持管理等については十分な知見を有しているが、これまで太陽光発電システムに系統連系した経験がないため、本プロジェクトの系統連系に関する技術指導が求められている。

よって、これらの内容を網羅したソフトコンポーネントを実施することが、導入システムの円滑な運用立ち上げと協力成果の持続性を確保するために必要である。

1.3. 運営維持管理に関わる組織

グルジア空港管理会社：

グルジア空港管理会社の営繕部が太陽光発電システムの運営維持管理の担当部門となる。営繕部の中の電気技術者 3 名が運営維持管理に携わる予定である。

ターミナルビル運営管理会社（TAV）：

現在トビリシ国際空港の運営維持管理を行なっている TAV が本太陽光発電システムの運営維持管理を行う。現在の空港の電気技術者 5 名が運営維持管理に携わる予定である。

イリア国立大学：

イリア国立大学に新たに設立されるイノベーション・コマーシャライゼーション部が太陽光発電システムの運営維持管理の担当部門となる。現在、施設の運営時監理技術者を含む 5 名が運営維持管理に携わる予定である。

TELASI：

本太陽光発電システムは、トビリシ市及びその周辺地区を担当する配電会社である TELASI の配電線に接続を行う。トビリシ国際空港及びイリア国立大学周辺地区の配電線の運営維持管理に従事している 10 名が太陽光発電システムの系統連系部分における運営維持管理を担当する。

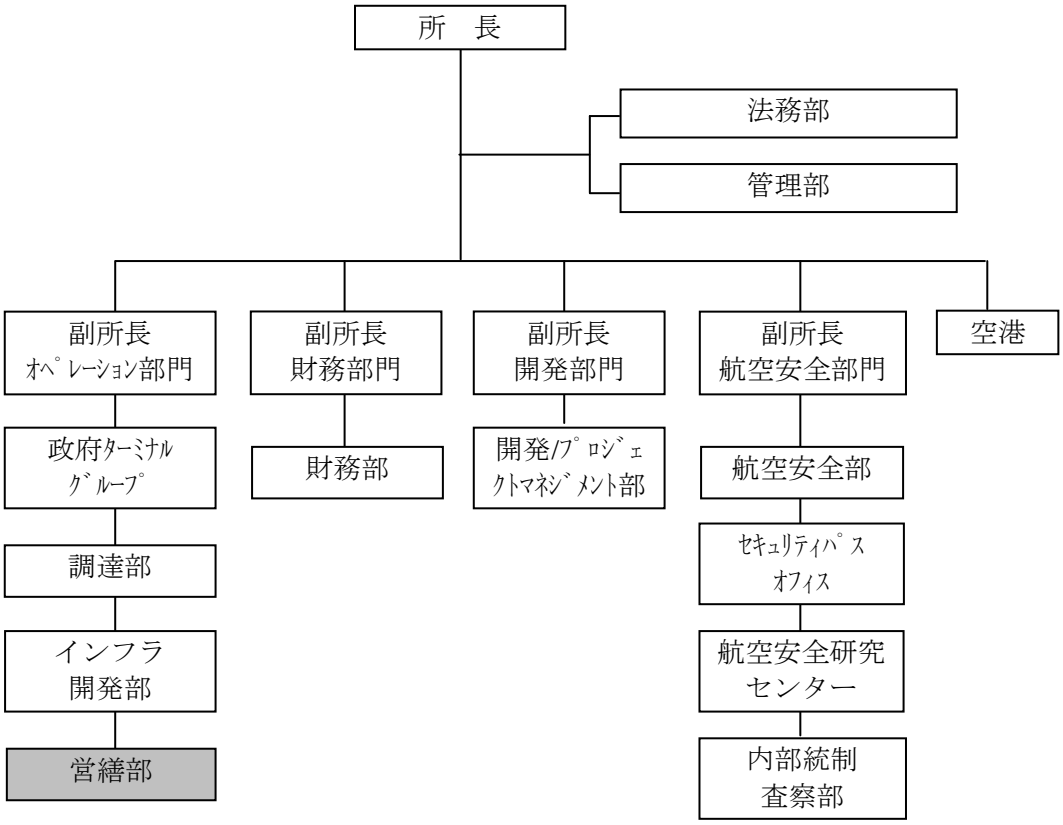


図1　グルジア空港管理会社組織図

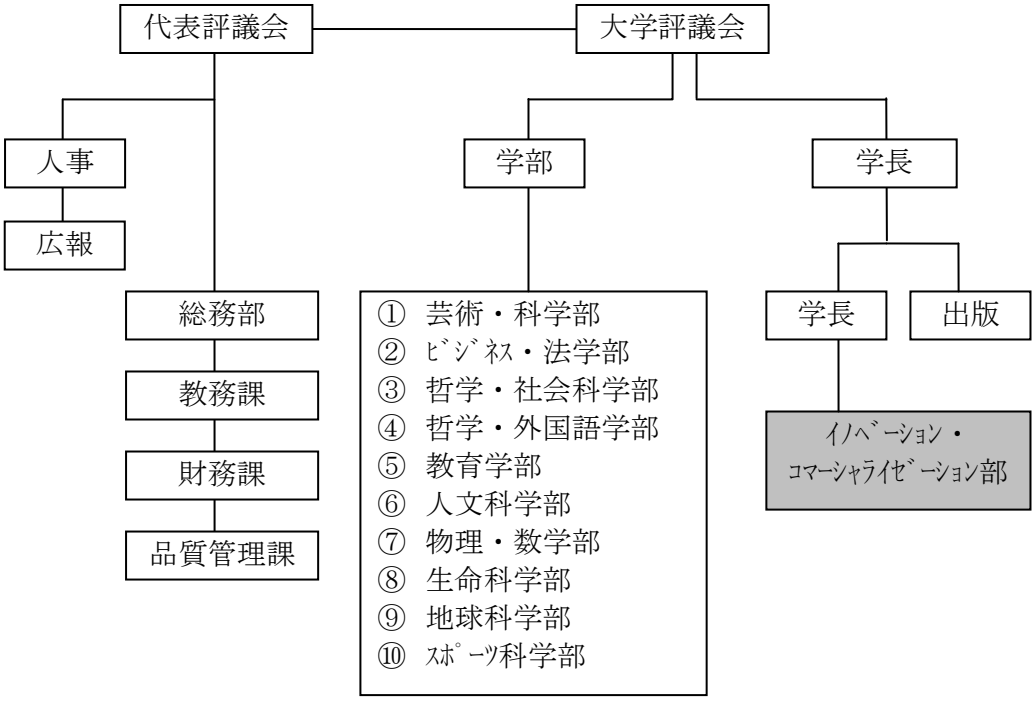


図2　イリア国立大学組織図

2. ソフトコンポーネントの目標

導入システムの円滑な運用立ち上げと協力成果の持続性の確保を可能とするために、以下のソフトコンポーネントの目標を設定する。

１．太陽光発電システム・機材を適切に維持管理できるようになること

２．事故対応を含めた系統連系運用ができるようになること

３．得られた電力及び気象データを適切に整理、編集、処理し活用できるようになること

3. ソフトコンポーネントの成果

ソフトコンポーネント実施の結果としてソフトコンポーネント完了時に達成されるべき成果として、以下３点を挙げる。

１．太陽光発電システムのトラブル予防、対処方法を含めた運営維持管理方法について理解する

２．系統連系における、トラブル予防、対処方法を含めた運営維持管理及び逆潮流に関する設定方法・運営維持管理について理解する

３．電力および気象データに関する機材のトラブル予防、対処方法を含めた運営維持管理方法及びデータの整理、編集、処理、活用の意義と方法について理解する

4. 成果達成度の確認方法

研修においては、研修生の主体的な取り組みを引き出すため、講義形式のみならず導入した機材を使用した演習（実地演習）等をとりいれた、インタラクティブな研修プログラムを計画する。研修内容に対する研修生の理解度テスト等で、成果の達成度を確認することを基本方針とする。

成果達成度の具体的な確認方法について下表の通りである。

表４　成果達成度の確認指標と確認方法

成果	確認方法
１．太陽光発電システムのトラブル予防、対処方法を含めた運営維持管理方法について理解する	1-1 研修終了時に太陽光発電システムの機器の名称・役割、トラブルの対処法、機器の点検、清掃の仕方等運営・維持管理にかかる理解度テスト（実地テストも含む）を行う。 1-2 研修生により太陽光発電システムの日及び月毎の点検表、故障・修理記録表等が策定される
２．系統連系について、トラブル予防、対処方法を含めた運営維持管理及び逆潮流に関する設定方法・運営維持管理について理解する	2-1 研修終了時に系統連系に関する機器の名称・役割、定期点検、トラブル予防及び対処方法についての理解度テストを行う 2-2 研修終了時に逆潮流の設定に関する理解度テスト（実地テストも含む）を行う 2-3 研修生により系統連系に関する日常及び定期点検表、故障・修理記録表等が策定される
３．電力および気象データに関する機材のトラブル予防、対処方法を含めた運営維持管理方法及びデータの整理、編集、処理、活用の意義と方法について理解する	3-1 研修終了時に電力および気象データに関する機器の名称・役割、トラブルの対処法、機器の点検、清掃の仕方等運営・維持管理にかかる理解度テストを行う。 3-2 研修生により電力および気象データに関する機材に関する日常及び定期点検表、故障・修理記録表等が策定される 3-3 研修生により運営維持管理に関わる財務諸表が策定される 3-4 研修生により CO2 削減量、電力及び気象データのグラフ等を用いた広報活動に使用できるプレゼンテーション資料が作成される

5.　ソフトコンポーネントの活動（投入計画）

5.1.　活動

ソフトコンポーネントにおける期待される成果に対する活動内容を以下に示す。

【成果１：太陽光発電システムのトラブル予防、対処方法を含めた運営維持管理方法について理解する】

太陽光発電システムとその構成要素に係る一連のマニュアル、作業の流れを示す資料、上記活動内容に対応するマニュアルを用い、講義による説明と、構築する太陽光発電システムを用いた実習を実施する。

＜内容＞

a) 太陽光発電システムの発電原理、構成等を理解するための指導

b) 主要構成要素である太陽光モジュール、接続箱、パワーコンディショナなどの機能、特性などを理解するための指導

c) 不適切な運用による不具合事例およびその予防措置システム等を理解し、機器の不具合発生時に迅速、適切な対応が可能となるための指導

d) 日常点検や定期点検方法に関する技術、技能、計画に関する指導

e) 接地抵抗測定や絶縁抵抗測定等の各種試験に関する技術、技能、計画に関する指導

f) 機器更新計画および点検・修理時のメーカー技術者派遣に関して等、設備更新に関する指導

g) 運営維持管理に関わる財務計画の指導

【成果２：系統連系について、トラブル予防、対処方法を含めた運営維持管理及び逆潮流に関する設定方法・運営維持管理について理解する】

系統連系に関わる受変電装置構成機器の機能、特性などについて、実物機器を用いた講義を行う。また、システムや機器の不具合発生時における系統連系側の対応、連絡体制に関わるマニュアル、作業の流れを示す資料を用い、講義による説明と受変電装置、太陽光発電システムを用いた実習を実施する。

＜内容＞

a) 系統連系の接続ポイントである受変電装置の機器構成を理解するための指導
b) 主要構成要素である遮断器、各種保護継電器、変圧器、計測機器などの機能、特性などを理解するための指導
c) システム機器の不具合発生時に迅速、適切な対応が可能となるための指導
d) 日常点検や定期点検方法に関する技術、技能、計画に関わる指導
e) 接地抵抗測定や絶縁抵抗測定等の各種試験に関する技術、技能、計画に関する指導
f) 逆潮流の設定及び運営維持管理に関する指導
g) 機器更新計画および点検・修理時のメーカー技術者派遣に関して等、設備更新に関する指導

【成果３：電力および気象データに関する機材のトラブル予防、対処方法を含めた運営維持管理方法及びデータの整理、編集、処理、活用の意義と方法について理解する】

各種計測・観測機器の機能、特性などについて、実物機器を用いた講義を行う。また、計測されたデータの処理、分析方法、得られた結果のディスプレイ等への表示方法については、操作マニュアル、作業の流れを示す資料を用いた講義及び構築する計測監視装置及びディスプレイ装置等を用いて実習を行う。

＜内容＞

a）太陽光発電システムの各種計測装置の機器構成を理解するための指導
b）気象観測装置の機能、特性等を理解するための指導
c）太陽光発電システム及び気象観測装置から計測監視装置へデータを適正に収集し、データーベース化等を可能とするための指導
d）発電電力量と気象の関係など、各種データの意味を理解し、分析・評価するための知識を習得し、買電電力予算の算出など、運営に活用できるようにするための指導
e）グラフ化されたデータをディスプレイに伝送、表示させたりし、広報活動が適切に行えるようにするための指導
f）機器更新計画及び点検・修理時のメーカー技術者派遣に関して等、設備更新に関する指導

5.2. グルジア側成果品

グルジア側の成果品は、ソフトコンポーネントにて作成される以下のマニュアル類である。

- 太陽光発電システム維持管理マニュアル
- 電力および気象データの整理、編集、処理、活用マニュアル
- トラブルシューティングにかかるマニュアル
- 日常及び定期点検表
- 故障・修理記録表
- 運営維持管理に関する財務諸表

5.3. 実施リソース

本ソフトコンポーネントに投入する実施リソースを下表にまとめた。なお研修者（ターゲット・グループ）は、グルジア空港管理会社、空港ターミナルビル運営管理会社、イリア国立大学及びトビリシ地区配電会社である。

表５　実施リソース

グルジア側	日本側
研修者（ターゲットグループ）： グルジア空港管理会社：3 名 空港ターミナルビル運営管理会社：5 名 イリア国立大学：10 名 トビリシ地区配電会社：10 名 研修場所： トビリシ国際空港 イリア国立大学	研修指導員： 太陽光発電システム維持管理指導員：1.5MM 系統連系指導員：1.5MM データ処理情報システム指導員：1.5MM 現地研修期間： 30 日間

研修指導員は、上記に示すように太陽光発電システム維持管理指導員、系統連系指導員、データ処理情報システム指導員の 3 名を計画する。太陽光発電システム維持管理指導員は主に成果１、系統連系指導員は主に成果２、データ処理情報システム指導員は主に成果３につながる部分の研修を担当する。

研修では、太陽光発電システムの運営維持管理、電気及び気象データ収集、整理･編集、解析に係る一連のマニュアル、作業の流れを示す資料と共に JICA 発行の系統連系太陽光発電システムマニュアルを教材として用いる。また、講義による説明ならびに構築する太陽光発電システム、計測監視装置を実習教材として用いる予定である。各システムの維持管理方法、障害発生時の処理法その他に関しても講義、実習を行う。

6.　ソフトコンポーネントの実施リソースの調達方法

6.1.　本邦コンサルタントの派遣

「グ」国では、系統連系型太陽光発電システムの導入は初めての取り組みであることから、「グ」国内のローカルリソースへの再委託を利用しての研修活動は計画できない。したがって、国外リソースを利用しての研修活動を実施することを提案する。ここでは、研修指導員として本邦コンサルタントを前提とした計画としている。なお、研修指導員は、以下の分野の実績および能力を有する人材が適切である。

表６　研修指導員に求められる実績および能力

担　当　名	分　野	実　績	能　力
太陽光発電システム維持管理指導員	太陽光発電システム	過去に類似の研修	英語でコミュニケーションが可能
系統連系指導員	系統連系システム		
データ処理情報システム指導員	電力・気象等の情報システムおよびデータ処理		

なお、研修対象となる人材は、英語での研修に必要な英語力を有していないことが準備調査にて確認されたため、通訳を介して本邦コンサルタントが講義を行うことを計画する。

6.2. 研修指導員選定方法

選定にあたっては、複数者からの技術提案書（経歴書を含む）の審査ならびに面接試験を行ったうえで、予算内に収まり、同時に高いパフォーマンスを期待できる本邦コンサルタントを研修指導員として選定する。

7. ソフトコンポーネントの実施工程

本ソフトコンポーネントの実施工程を以下に示す。なお、トビリシ国際空港、イリア国立大学の二箇所に太陽光発電システムを導入すること、各研修者の立場および人数等を考慮して、「グルジア空港管理会社・空港ターミナルビル運営管理会社」、「イリア国立大学」、「トビリシ地区配電会社」の３グループに分かれ、各分野の研修をそれぞれ行う計画とする。

	１ヶ月目	２ヶ月目	３ヶ月目
国内準備作業	0.4MM	▲機器検収・引渡し	
現地研修期間	1.0MM		
国内とりまとめ作業		0.1MM	

図３　実施工程

8. ソフトコンポーネンの成果品

本ソフトコンポーネントの成果品を以下に示す。実施期間は、国内作業 0.5 ヶ月、現地研修期間 1.0 ヶ月であることから、短期間のソフトコンポーネント事業とみなし、途中に Progress Report ならびにソフトコンポーネント実施報告書は作成せず、施主に対しては英語版の Final Report にて、また JICA に対しては Final Report を添付したソフトコンポーネント完了報告書にて報告を行う。

表７　成果品一覧

１．　Final Report（英語、施主に提出）

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 etc. as the part of Outputs

２．　完了報告書（日本語、JICA に提出、ソフトコンポーネント完了報告書記載要領に示された様式にて）

① 案件概要　（案件名、E/N 締結日、E/N 限度額、コンサルタント契約額）
② ソフトコンポーネント概要（経費、背景、計画した目標、計画した成果 計画した活動内容、従事者、先方参加者、実施機関（時期及び M/M)、活動実績、成果の達成状況）
③ 効果を持続・発展させ、目標を達成するための今後の課題・提言等
④ 添付書類（ソフトコンポーネント実施スケジュール、ソフトコンポーネント従事者履歴書、先方参加者リスト、トレーニング出席簿、成果物リスト）
⑤ 別添資料集（成果品（施主への完了報告書、作成したマニュアル類、使用したテキスト、理解度テスト結果等)、その他映像、写真、新聞記事等）

9.　ソフトコンポーネントの概算事業費

本ソフトコンポーネントの概算事業費は以下の通り。

表８　概算事業費

項　目	金額(千円)
直接人件費	3,501
直接経費	3,037
間接費	4,481
合　計	11,019

なお、現地再委託費は無い。

10.　相手国実施機関の責務

無償資金協力で導入される機材が有効に継続的に活用されるために、本案件の実施機関であるグルジア空港管理会社及びイリア国立大学は以下に示す内容を実施する必要がある。

- 「運営維持管理マニュアル」を必要に応じて改定していくこと
- トビリシ地区配電会社である TELASI と定期的にコミュニケーションを取り、運営維持管理向上に努めること。
- 上記活動を継続するための人材育成の継続的に取り組む

資料７．環境社会配慮チェックリスト

グルジア　太陽光を活用したクリーンエネルギー導入計画

環境社会配慮チェックリスト　(その他発電)

No.	分類	環境項目	主なチェック事項	環境影響				環境問題	環境配慮確認結果/計画される緩和策
				大	小	なし	不明		
1.	許認可・説明	(1)EIA 及び環境許認可	①環境影響評価報告書（EIA レポート）等は作成済みか。						実施機関である国立腫瘍学研究所は審査申請書類を環境省に提出し EIA 実施が必要か否かの通知を受ける。EIA 実施の必要はないと思われるが、必要な場合は実施機関である国立腫瘍学研究所は EIA を実施し、環境省の許認可を得る。
			②EIA 等は当該国政府によって承認されているか。						
			③EIA レポート等の承認は無条件か。付帯条件がある場合には、その条件は満たされるか。						
			④上記以外に、必要な場合には現地の所管官庁から環境に関する許認可は取得済みか。						
		(2) 住民への説明	①プロジェクトの内容及び影響について、情報公開を含め地域住民に適切な説明を行い、理解を得るか。						実施機関である国立腫瘍学研究所は住民に説明し、理解を得る。
			②住民及び所管官庁からのコメントに対して適切に対応されるか。						実施機関である国立腫瘍学研究所は適切に対応する。
2.	汚染対策	(1)大気質	①バイオマスエネルギー等の燃焼を伴う発電設備の場合、発電所操業に伴って排出される硫黄酸化物(SOx)、窒素酸化物（NOx）、煤塵等の大気汚染物質は、当該国の排出基準、環境基準を満たすか。②地熱発電所から排出される硫化水素等の大気汚染物質は、当該国の基準を満足するか。硫化水素による周辺植生等への影響は生じないか。③その他の施設から排出される大気汚染物質は、当該国の基準を満足するか。			✔		太陽光発電設備のため、汚染物質は発しない。	
		(2)水質	①発電設備等からの排水（温排水を含む）は当該国の排出基準を満足するか。また、排出により環境基準を下回る区間が生じないか。			✔		同上。	
			②地熱発電の場合、地熱利用に起因するヒ素、水銀等の水質汚染は生じないか。汚染が生じる場合、対策は用意されるか。			✔		同上。	
			③廃棄物処分場からの浸出水は当該国の排出基準を満足するか。浸出水により土壌・地下水、海洋等を汚染しない対策がなされるか。			✔		同上。	

No.	分類	環境項目	主なチェック事項	環境影響				環境問題	環境配慮確認結果/計画される緩和策
				大	小	なし	不明		
		(3)廃棄物	施設稼動に伴って発生する廃棄物は当該国の基準に従って適切に処理・処分されるか（特にバイオマスエネルギー）。			✔		特に発生する廃棄物はない。	
		(4)土壌汚染	サイトの土壌は、過去汚染されたことがないか。また、土壌を汚染しない対策がなされるか。			✔			
		(5)騒音・振動	騒音・振動は当該国の基準を満足するか。		✔				請負工事業者は、グルジア国の環境基準を遵守して施工を行う。
		(6)地盤沈下	大量の地下水汲上げ、または地熱発電における蒸気の採取により地盤沈下は生じないか。			✔			
		(7)悪臭	悪臭源はないか。悪臭防止の対策は取られるか。			✔			
3.	自然環境	(1)保護区	サイトは当該国の法律、国際条約等に定められた保護地区に立地しないか。プロジェクトが保護区に影響を与えないか。			✔			
		(2)生態系	①サイトは原生林、熱帯の自然林、生態学的に重要な生息地（珊瑚礁、マングローブ湿地、干潟等）を含まないか。			✔			
			②サイトは当該国の法律、国際条約等で保護が必要とされる貴重種の生息地を含まないか。			✔			
			③生態系への重大な影響が懸念される場合、生態系への影響を減らす対策はなされるか。			✔			
			④風力発電による微気象の変化が周辺の貴重な植生に影響を与えないか（風力発電施設近傍に貴重な植生は存在しないか）。影響を与える場合は適切な対策が用意されているか。			✔			
			⑤風力発電施設（風車）は貴重な鳥類の生息地や渡り鳥の飛行コースを考慮して設置されるか。			✔			
		(3)水象	堰等の構造物の設置による水系の変化に伴い、地表水・地下水の流れに悪影響を及ぼさないか（特に流れ込み式水力発電の場合）。			✔			
		(4)地形・地質	プロジェクトにより計画地周辺の地形・地質構造が大規模な改変や自然海浜の消失は生じないか（特に流れ込み式水力発電、地熱発電）。			✔			

No.	分類	環境項目	主なチェック事項	環境影響				環境問題	環境配慮確認結果/計画される緩和策
				大	小	なし	不明		
4.	社会環境	(1)住民移転	①プロジェクトの実施に伴い非自発的住民移転は生じないか。生じる場合は、移転による影響を最小限にする努力がなされるか。			✔			
			②移転する住民に対して、移転前に移転・補償に関する適切な説明が行われるか。			✔			
			③住民移転のために調査がなされ、正当な補償、移転後の生活基盤の回復を含む移転計画が立てられるか。			✔			
			④移転住民のうち特に女性、子供、老人、貧困層、少数民族・先住民族等の社会的弱者に適切な配慮がなされた計画か。			✔			
			⑤移転住民について移転前の合意は得られるか。			✔			
			⑥住民移転を適切に実施するための体制は整えられるか。十分な実施能力と予算措置が講じられるか。			✔			
			⑦移転による影響のモニタリングが計画されるか。			✔			
		(2)生活・生計	①プロジェクトによる住民の生活への悪影響はないか。必要な場合は影響を緩和する配慮が行われるか。			✔			
			②プロジェクトによる取水（地表水、地下水）や排水の放流が既存の水利用、水域利用の悪影響を及ぼさないか。			✔			
		(3)文化遺産	プロジェクトにより、考古学的、歴史的、文化的、宗教的に貴重な遺産、史跡等を損なわないか。また、当該国の国内法上定められた措置が考慮されるか。			✔			
		(4)景観	特に配慮すべき景観への悪影響はないか。必要な対策は取られるか。			✔			
		(5)少数民族、先住民族	①当該国の少数民族、先住民族の権利に関する法律が守られるか。			✔			
			②少数民族、先住民族の文化、生活様式への影響を軽減する配慮がなされるか。			✔			
5.	その他	(1)工事中の影響	①工事中の汚染（騒音、振動、濁水、粉塵、排ガス、廃棄物等）に対して緩和策が用意されるか。		✔			騒音・振動、濁水、粉塵、排ガス、廃棄物等	請負工事業者は、グルジア国の環境基準を遵守して施工を行う。
			②工事により自然環境（生態系）に悪影響を及ぼさないか。また、影響に対する緩和策が用意されるか。			✔			

No.	分類	環境項目	主なチェック事項	環境影響				環境問題	環境配慮確認結果/計画される緩和策
				大	小	なし	不明		
			③工事により社会環境に悪影響を及ぼさないか。また、影響に対する緩和策が用意されるか。		✔			交通迂回、渋滞等	請負工事業者は、環境への支障のない施工計画を策定し的確に実行する。
			④必要に応じ、作業員等のプロジェクト関係者に対して安全教育（交通安全・公衆衛生等）を行うか。		✔			交通安全	請負工事業者は、安全教育の徹底を図る。
		(2) モニタリング	①上記の環境項目のうち、影響が考えられる項目に対して、事業者のモニタリングが計画・実施されるか。		✔				実施機関である国立腫瘍学研究所は、工事中の影響について、適切且つ有効なモニタリングを実施する。
			②当該計画の項目、方法、頻度等は適切なものと判断されるか。		✔				同上
			③事業者のモニタリング体制（組織、人員、機材、予算等とそれらの継続性）は確立されるか。		✔				同上
			④事業者から所管官庁等への報告の方法、頻度等は規定されているか。		✔				同上
6.	留意点	他の環境チェックリストの参照	必要な場合には、送変電・配電に係るチェックリストの当該チェック事項も追加して評価すること（送電線・配電施設の建設を伴う場合等）。			✔			
		環境チェックリスト使用上の注意	必要な場合には、越境または地球規模の環境問題への影響も確認する。（廃棄物の越境、酸性雨、オゾン層破壊、地球温暖化の問題に係る要素が考えられる場合等）			✔			

1) 表中『当該国の基準』については、国際的に認められた基準と比較して著しいい乖離がある場合には、必要に応じて対応策を検討する。当該国において現在規制が確立されていない項目については、当該国以外（日本における経験も含めて）の適切な基準との比較により検討を行う。

2) 環境チェックリストはあくまでも標準的な環境チェック項目を示したものであり、事業及び地域の特性によっては、項目の削除または追加を行う必要がある。

資料８．月間・年間発電電力量シミュレーション

月間・年間発電電力量シミュレーション （トビリシ国際空港）

	年間発電電力量		
	(1) 駐車場	(2) 駐車場脇広場	合計
① 日陰を考慮した場合	220,292 kWh/year	111,075 kWh/year	331,367 kWh/year
② 日陰がない場合	225,575 kWh/year	111,075 kWh/year	336,649 kWh/year
日照係数	97.7 %	100.0 %	98.4 %

（1） 駐車場

PV発電出力 PV: 210 kW
総合設計係数 Kt: 0.7
傾斜方位係数 Ks: 1.057
パネル設置方位 223 °（南西）
パネル傾斜角 25 °

① 日陰を考慮した場合

月	PV定格出力 (kW)	日射量 (kWh/㎡/d)	傾斜係数	総合設計係数	日照係数	日数 (日数/月)	発電電力量 (kWh)
1	210	2.08	1.057	0.7	0.89	31	8,917
2	210	2.87	1.057	0.7	0.94	28	11,737
3	210	3.80	1.057	0.7	1.00	31	18,304
4	210	4.70	1.057	0.7	1.00	30	21,908
5	210	5.58	1.057	0.7	1.00	31	26,877
6	210	6.30	1.057	0.7	1.00	30	29,367
7	210	5.95	1.057	0.7	1.00	31	28,660
8	210	5.15	1.057	0.7	1.00	31	24,806
9	210	4.23	1.057	0.7	1.00	30	19,718
10	210	3.11	1.057	0.7	0.94	31	14,081
11	210	2.16	1.057	0.7	0.89	30	8,961
12	210	1.74	1.057	0.7	0.83	31	6,956
年間発電電力量						365	220,292

②日陰がない場合

月	PV定格出力 (kW)	日射量 (kWh/㎡/d)	傾斜係数	総合設計係数	日照係数	日数 (日数/月)	発電電力量 (kWh)
1	210	2.08	1.057	0.7	1.00	31	10,019
2	210	2.87	1.057	0.7	1.00	28	12,486
3	210	3.80	1.057	0.7	1.00	31	18,304
4	210	4.70	1.057	0.7	1.00	30	21,908
5	210	5.58	1.057	0.7	1.00	31	26,877
6	210	6.30	1.057	0.7	1.00	30	29,367
7	210	5.95	1.057	0.7	1.00	31	28,660
8	210	5.15	1.057	0.7	1.00	31	24,806
9	210	4.23	1.057	0.7	1.00	30	19,718
10	210	3.11	1.057	0.7	1.00	31	14,980
11	210	2.16	1.057	0.7	1.00	30	10,069
12	210	1.74	1.057	0.7	1.00	31	8,381
年間発電電力量						365	225,575

（2） 駐車場脇広場

PV発電出力 PV: 100 kW
総合設計係数 Kt: 0.7
傾斜方位係数 Ks: 1.093
パネル設置方位 180 °（南）
パネル傾斜角 30 °

① 日陰を考慮した場合

月	PV定格出力 (kW)	日射量 (kWh/㎡/d)	傾斜係数	総合設計係数	日照係数	日数 (日数/月)	発電電力量 (kWh)
1	100	2.08	1.093	0.7	1.00	31	4,933
2	100	2.87	1.093	0.7	1.00	28	6,148
3	100	3.80	1.093	0.7	1.00	31	9,013
4	100	4.70	1.093	0.7	1.00	30	10,788
5	100	5.58	1.093	0.7	1.00	31	13,235
6	100	6.30	1.093	0.7	1.00	30	14,460
7	100	5.95	1.093	0.7	1.00	31	14,112
8	100	5.15	1.093	0.7	1.00	31	12,215
9	100	4.23	1.093	0.7	1.00	30	9,709
10	100	3.11	1.093	0.7	1.00	31	7,376
11	100	2.16	1.093	0.7	1.00	30	4,958
12	100	1.74	1.093	0.7	1.00	31	4,127
年間発電電力量						365	111,075

① 日陰を考慮した場合

月	PV定格出力 (kW)	日射量 (kWh/㎡/d)	傾斜係数	総合設計係数	日照係数	日数 (日数/月)	発電電力量 (kWh)
1	100	2.08	1.093	0.7	1.00	31	4,933
2	100	2.87	1.093	0.7	1.00	28	6,148
3	100	3.80	1.093	0.7	1.00	31	9,013
4	100	4.70	1.093	0.7	1.00	30	10,788
5	100	5.58	1.093	0.7	1.00	31	13,235
6	100	6.30	1.093	0.7	1.00	30	14,460
7	100	5.95	1.093	0.7	1.00	31	14,112
8	100	5.15	1.093	0.7	1.00	31	12,215
9	100	4.23	1.093	0.7	1.00	30	9,709
10	100	3.11	1.093	0.7	1.00	31	7,376
11	100	2.16	1.093	0.7	1.00	30	4,958
12	100	1.74	1.093	0.7	1.00	31	4,127
年間発電電力量						365	111,075

日照係数シミュレーション（トビリシ国際空港:駐車場）

1．年間日照係数

	日射量 (kWh/㎡/day)	日数 (日)	日照係数 (%)	日射量(1) (KWh/㎡/month)	日射量(2) (KWh/㎡/month)
1月	2.08	31	89	64.48	57.39
2月	2.87	28	94	80.36	75.54
3月	3.80	31	100	117.80	117.80
4月	4.70	30	100	141.00	141.00
5月	5.58	31	100	172.98	172.98
6月	6.30	30	100	189.00	189.00
7月	5.95	31	100	184.45	184.45
8月	5.15	31	100	159.65	159.65
9月	4.23	30	100	126.90	126.90
10月	3.11	31	94	96.41	90.63
11月	2.16	30	89	64.80	57.67
12月	1.74	31	83	53.94	44.77
合計/平均	3.98	365		1,451.77	1,417.77
年間日照係数				**97.7%**	

*日射量(1):日影の影響がない場合
*日射量(2):日影の影響を考慮した場合

2．季節における日照係数

（1） 冬至

区域	面積 (㎡)	日照時間 (h)	面積時間(㎡・h) 計	合計
①	210.0	7.5	1575.0	
②	1190.0	6.5	7735.0	
			0.0	
			0.0	
			0.0	
			0.0	9,310.0
			0.0	
			0.0	
合計	1400.0	8		11,200.0
日照係数			**83%**	

（2） 春・秋分

区域	面積 (㎡)	日照時間 (h)	面積時間(㎡・h) 計	合計
	1400.0	8	11200.0	
			0.0	
			0.0	
			0.0	
			0.0	11,200.0
			0.0	
			0.0	
			0.0	
			0.0	
合計	1400.0	8		11,200.0
日照係数			**100%**	

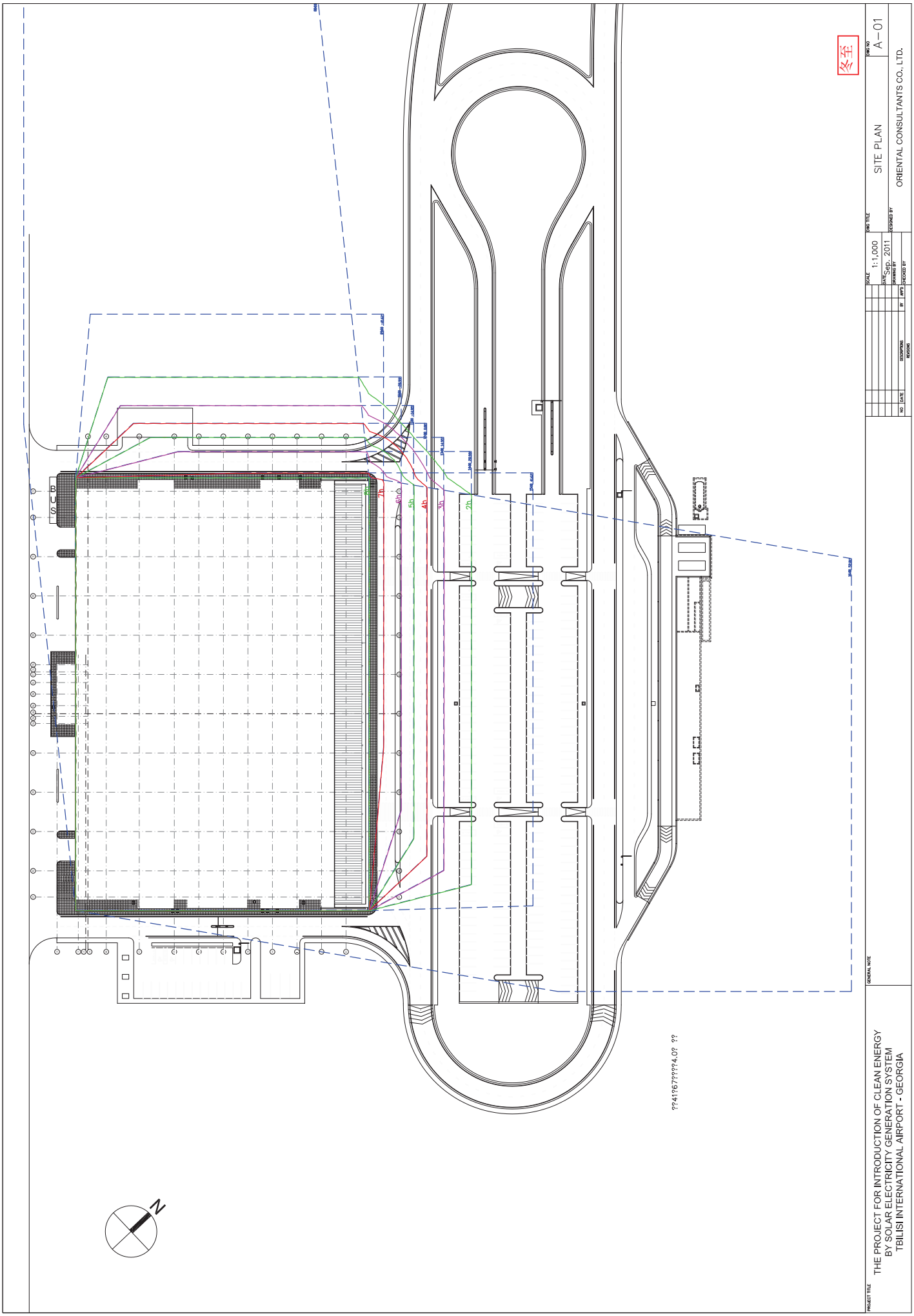
（3） 夏至

区域	面積 (㎡)	日照時間 (h)	面積時間(㎡・h) 計	合計
	1400.0	8	11,200.0	
			0.0	
			0.0	
			0.0	11200.0
			0.0	
			0.0	
			0.0	
合計	1400.0	8		11,200.0
日照係数			**100%**	

設置方位・傾斜角における傾斜面日射量シミュレーション（トビリシ国際空港）

緯度: 北緯 41° 68'
経度: 東経 45°
冬至の9時・15時における太陽高度: 13°
冬至の9時・15時における太陽方位: 42°

方位角 / 傾斜角	180°（真南）		
	傾斜面日射量（kWh/㎡）	水平日射量との比率	最適傾斜角との比率（%）
0°（水平）	3.66	1.00	91.5%
5°	3.76	1.027	94.0%
10°	3.85	1.052	96.3%
15°	3.92	1.071	98.0%
20°	3.97	1.085	99.3%
25°	3.99	1.090	99.8%
30°	**4.00**	**1.093**	**100.0%**
35°	3.99	1.090	99.8%
40°	3.95	1.079	98.8%
45°	3.90	1.066	97.5%
50°	3.82	1.044	95.5%
55°	3.72	1.016	93.0%
60°	3.61	0.986	90.3%
65°	3.48	0.951	87.0%
70°	3.33	0.910	83.3%
75°	3.17	0.866	79.3%
80°	2.99	0.817	74.8%
85°	2.80	0.765	70.0%
90°（垂直）	2.60	0.710	65.0%
方位角 / 傾斜角	223°（南西）		
	傾斜面日射量（kWh/㎡）	水平日射量との比率	最適傾斜角との比率（%）
0°（水平）	3.66	1.000	91.5%
5°	3.73	1.019	93.3%
10°	3.79	1.036	94.8%
15°	3.84	1.049	96.0%
20°	3.86	1.055	96.5%
25°	**3.87**	**1.057**	**96.8%**
30°	3.86	1.055	96.5%
35°	3.83	1.046	95.8%
40°	3.79	1.036	94.8%
45°	3.73	1.019	93.3%
50°	3.65	0.997	91.3%
55°	3.56	0.973	89.0%
60°	3.45	0.943	86.3%
65°	3.33	0.910	83.3%
70°	3.19	0.872	79.8%
75°	3.05	0.833	76.3%
80°	3.89	1.063	97.3%
85°	2.73	0.746	68.3%
90°（垂直）	2.55	0.697	63.8%


冬至
1h
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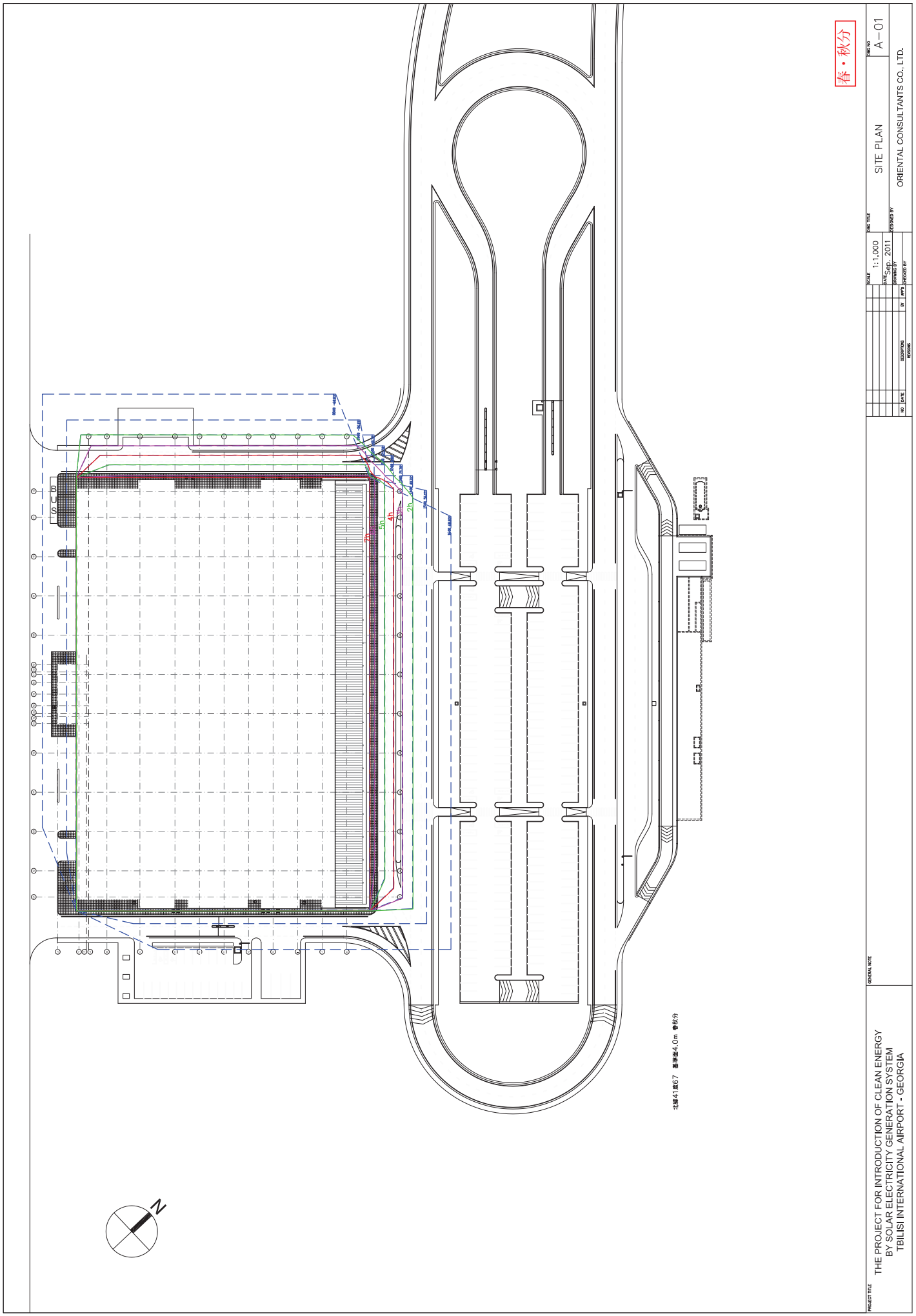
SCALE 1:1,000
DATE Sep. 2011
DRAWN BY
DESIGNED BY
CHECKED BY
DWG NO A-01
DWG TITLE
SITE PLAN
ORIENTAL CONSULTANTS CO., LTD.
GENERAL NOTE
PROJECT TITLE
THE PROJECT FOR INTRODUCTION OF CLEAN ENERGY
BY SOLAR ELECTRICITY GENERATION SYSTEM
TBILISI INTERNATIONAL AIRPORT - GEORGIA


春・秋分
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A－01
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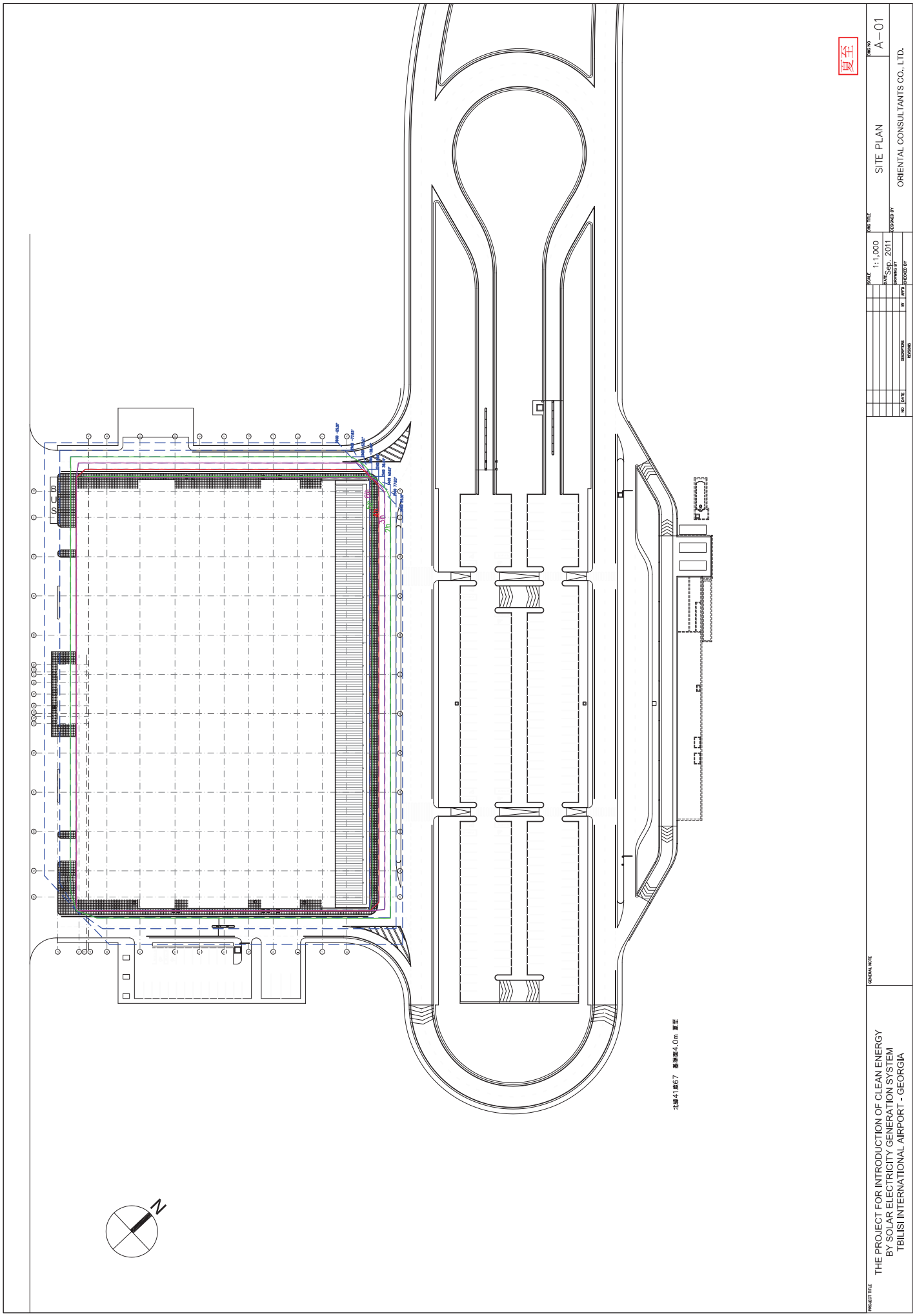
Sep. 2011
ORIENTAL CONSULTANTS CO., LTD.
THE PROJECT FOR INTRODUCTION OF CLEAN ENERGY
BY SOLAR ELECTRICITY GENERATION SYSTEM
TBILISI INTERNATIONAL AIRPORT - GEORGIA
N
北緯41度67 基準面4.0m 春秋分


夏至
北緯41度67 基準面4.0m 夏至
N
SITE PLAN
A-01
1:1,000
Sep. 2011
ORIENTAL CONSULTANTS CO., LTD.
THE PROJECT FOR INTRODUCTION OF CLEAN ENERGY
BY SOLAR ELECTRICITY GENERATION SYSTEM
TBILISI INTERNATIONAL AIRPORT - GEORGIA

月間･年間発電電力量シミュレーション （イリア国立大学）

	年間発電電力量	
(1) 日陰を考慮した場合	32,812	kWh/year
(2) 日陰がない場合	39,556	kWh/year
日照係数	83.0	%

PV発電出力 PV: 37 kW
総合設計係数 Kt: 0.7
傾斜方位係数 Ks: 1.052
パネル設置方位 179 °（南）
パネル傾斜角 10 °

A1. 日陰を考慮した場合

月	PV定格出力 (kW)	日射量 (kWh/d)	傾斜係数	総合設計係数	日照係数	日数 (日数/月)	発電電力量 (kWh)
1	37	2.08	1.052	0.7	0.59	31	1,037
2	37	2.87	1.052	0.7	0.73	28	1,598
3	37	3.80	1.052	0.7	0.85	31	2,728
4	37	4.70	1.052	0.7	0.88	30	3,381
5	37	5.58	1.052	0.7	0.91	31	4,289
6	37	6.30	1.052	0.7	0.93	30	4,789
7	37	5.95	1.052	0.7	0.91	31	4,573
8	37	5.15	1.052	0.7	0.88	31	3,828
9	37	4.23	1.052	0.7	0.85	30	2,939
10	37	3.11	1.052	0.7	0.73	31	1,918
11	37	2.16	1.052	0.7	0.59	30	1,042
12	37	1.74	1.052	0.7	0.47	31	691
年間発電電力量						365	32,812

A2. 日陰がない場合

月	PV定格出力 (kW)	日射量 (kWh/d)	傾斜係数	総合設計係数	日照係数	日数 (日数/月)	発電電力量 (kWh)
1	37	2.08	1.052	0.7	1.00	31	1,757
2	37	2.87	1.052	0.7	1.00	28	2,190
3	37	3.80	1.052	0.7	1.00	31	3,210
4	37	4.70	1.052	0.7	1.00	30	3,842
5	37	5.58	1.052	0.7	1.00	31	4,713
6	37	6.30	1.052	0.7	1.00	30	5,150
7	37	5.95	1.052	0.7	1.00	31	5,026
8	37	5.15	1.052	0.7	1.00	31	4,350
9	37	4.23	1.052	0.7	1.00	30	3,458
10	37	3.11	1.052	0.7	1.00	31	2,627
11	37	2.16	1.052	0.7	1.00	30	1,766
12	37	1.74	1.052	0.7	1.00	31	1,470
年間発電電力量						365	39,556

日照係数シミュレーション（イリア国立大学）

1．年間日照係数

	日射量 (kWh/㎡/day)	日数 （日）	日照係数 (%)	日射量(1) (KWh/㎡/month)	日射量(2) (KWh/㎡/month)
1月	2.08	31	59	64.48	38.04
2月	2.87	28	73	80.36	58.66
3月	3.80	31	**85**	117.80	100.13
4月	4.70	30	88	141.00	124.08
5月	5.58	31	91	172.98	157.41
6月	6.30	30	**93**	189.00	175.77
7月	5.95	31	91	184.45	167.85
8月	5.15	31	88	159.65	140.49
9月	4.23	30	**85**	126.90	107.87
10月	3.11	31	73	96.41	70.38
11月	2.16	30	59	64.80	38.23
12月	1.74	31	**47**	53.94	25.35
合計/平均	3.98	365		1,451.77	1,204.27
年間日照係数				**83.0%**	

*日射量(1):日影の影響がない場合
*日射量(2):日影の影響を考慮した場合

2．季節における日照係数

（1） 冬至

区域	面積 (㎡)	日照時間 (h)	面積時間(㎡・h) 計	合計
		8	0.0	
①	106.7	5	533.3	
②-1	34.0	4	136.0	
②-2	100.9	4	403.7	
③-1	37.7	3	113.1	
③-2	102.6	3	307.7	1,571.2
④	38.2	2	76.4	
⑤	1.1	1	1.1	
合計	421.1	8		3,368.8
日照係数			**47%**	

（2） 春・秋分

区域	面積 (㎡)	日照時間 (h)	面積時間(㎡・h) 計	合計
	153.1	8	1225.1	
①-1	2.4	7	17.0	
①-2	83.2	7	582.5	
②-1	7.8	6	46.8	
②-2	141.3	6	847.6	2,858.2
③-1	15.4	5	77.1	
④-1	8.8	4	35.1	
⑤-1	8.9	3	26.6	
⑥-1	0.2	2	0.4	
合計	421.1	8		3,368.8
日照係数			**85%**	

（3） 夏至

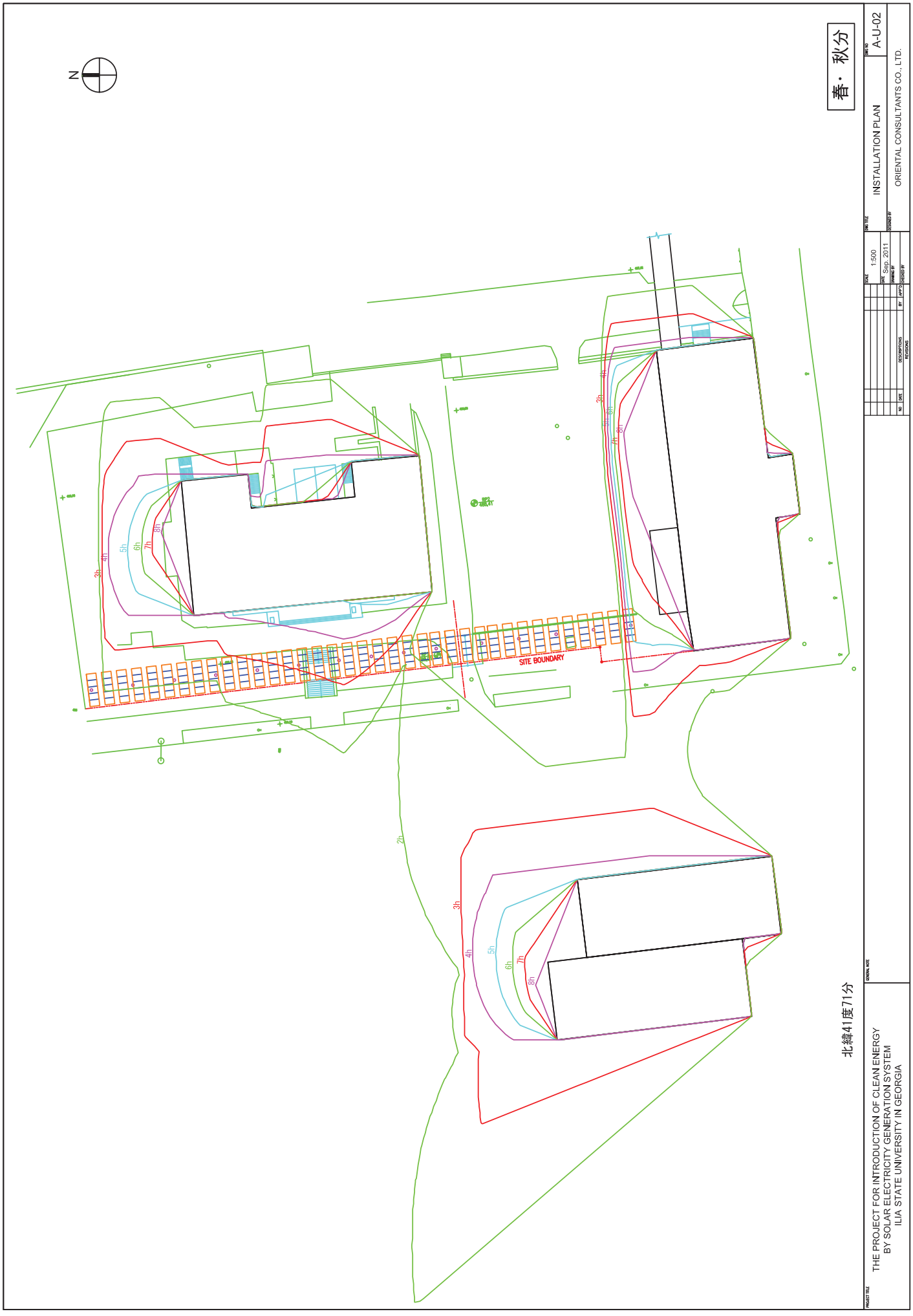
区域	面積 (㎡)	日照時間 (h)	面積時間(㎡・h) 計	合計
	226.3	8	1,810.2	
①-1	1.4	7	9.9	
①-2	149.3	7	1,045.2	
②-1	4.0	6	23.9	3126.2
②-2	37.0	6	221.8	
③-1	2.7	5	13.4	
④-1	0.5	4	2.0	
合計	421.1	8		3,368.8
日照係数			**93%**	

設置方位・傾斜角における傾斜面日射量シミュレーション（イリア国立大学）

緯度: 北緯 41° 68'
経度: 東経 45°
冬至の9時・15時における太陽高度: 13°
冬至の9時・15時における太陽方位: 42°

方位角 / 傾斜角	180°（真南）		
	傾斜面日射量（kWh/㎡）	水平日射量との比率	最適傾斜角との比率（%）
0°（水平）	3.66	1.00	91.5%
5°	3.76	1.027	94.0%
10°	3.85	1.052	96.3%
15°	3.92	1.071	98.0%
20°	3.97	1.085	99.3%
25°	3.99	1.090	99.8%
30°	**4.00**	1.093	100.0%
35°	3.99	1.090	99.8%
40°	3.95	1.079	98.8%
45°	3.90	1.066	97.5%
50°	3.82	1.044	95.5%
55°	3.72	1.016	93.0%
60°	3.61	0.986	90.3%
65°	3.48	0.951	87.0%
70°	3.33	0.910	83.3%
75°	3.17	0.866	79.3%
80°	2.99	0.817	74.8%
85°	2.80	0.765	70.0%
90°（垂直）	2.60	0.710	65.0%
方位角 / 傾斜角	179°（南）		
	傾斜面日射量（kWh/㎡）	水平日射量との比率	最適傾斜角との比率（%）
0°（水平）	3.66	1.000	91.5%
5°	3.76	1.027	94.0%
10°	3.85	**1.052**	**96.3%**
15°	3.92	1.071	98.0%
20°	3.97	1.085	99.3%
25°	3.99	1.090	99.8%
30°	**4.00**	1.093	100.0%
35°	3.99	1.090	99.8%
40°	3.95	1.079	98.8%
45°	3.90	1.066	97.5%
50°	3.82	1.044	95.5%
55°	3.72	1.016	93.0%
60°	3.61	0.986	90.3%
65°	3.48	0.951	87.0%
70°	3.33	0.910	83.3%
75°	3.17	0.866	79.3%
80°	2.99	0.817	74.8%
85°	2.80	0.765	70.0%
90°（垂直）	2.60	0.710	65.0%


冬至
N
SITE BOUNDARY
2h
3h
4h
5h
6h
7h
8h
北緯41度71分
THE PROJECT FOR INTRODUCTION OF CLEAN ENERGY
BY SOLAR ELECTRICITY GENERATION SYSTEM
ILIA STATE UNIVERSITY IN GEORGIA
INSTALLATION PLAN
A-U-01
1:500
Sep. 2011
ORIENTAL CONSULTANTS CO., LTD.


春・秋分
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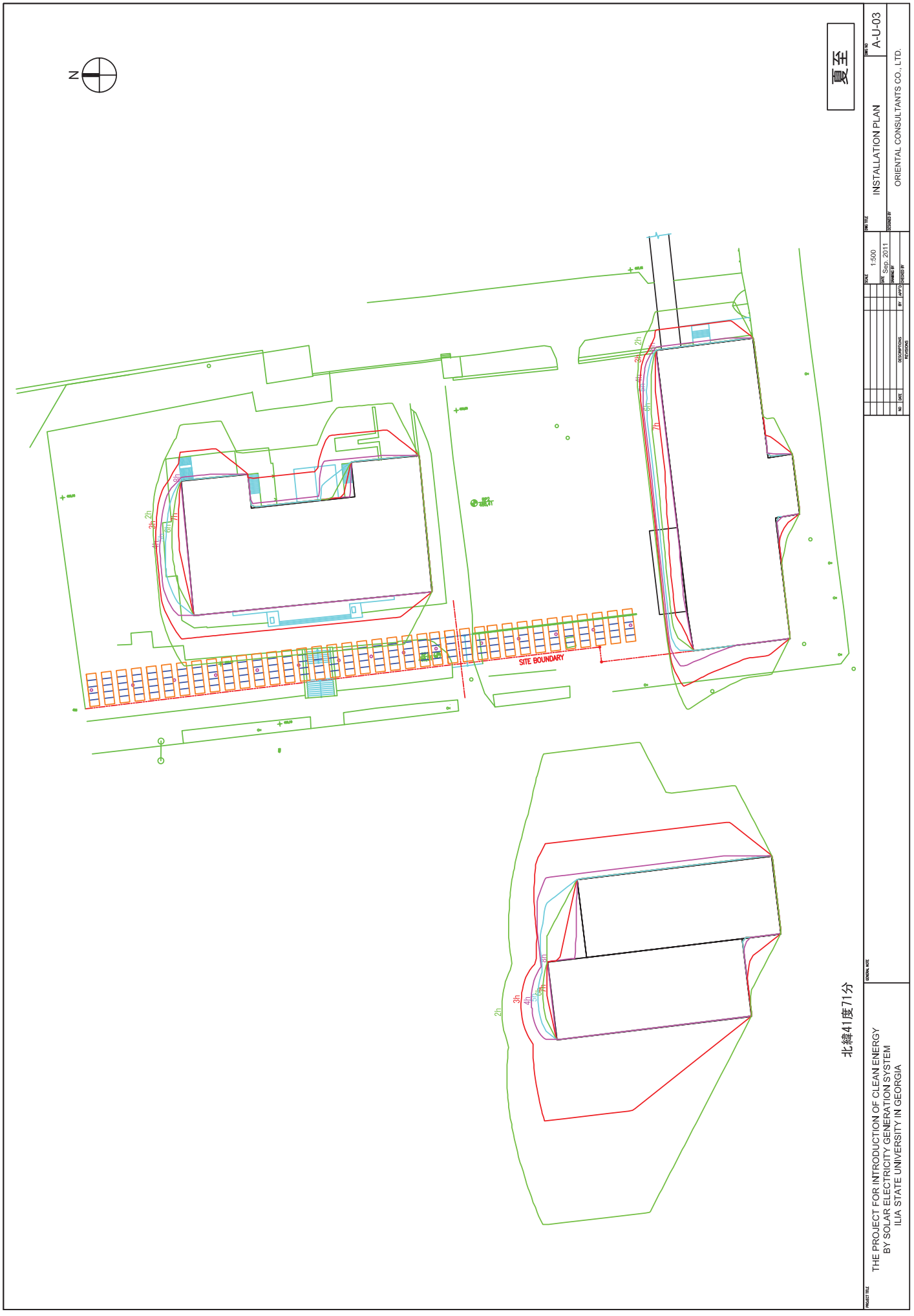
SITE BOUNDARY
2h
3h
4h
5h
6h
7h
8h
北緯41度71分
PROJECT TITLE
THE PROJECT FOR INTRODUCTION OF CLEAN ENERGY
BY SOLAR ELECTRICITY GENERATION SYSTEM
ILIA STATE UNIVERSITY IN GEORGIA
DRAWING NAME
INSTALLATION PLAN
DRG NO
A-U-02
SCALE
1:500
DATE
Sep. 2011
DESIGNED BY
DRAWN BY
CHECKED BY
APPD
BY
DESCRIPTIONS
REVISIONS
NO
DATE
ORIENTAL CONSULTANTS CO., LTD.


夏至
N
SITE BOUNDARY
北緯41度71分
THE PROJECT FOR INTRODUCTION OF CLEAN ENERGY
BY SOLAR ELECTRICITY GENERATION SYSTEM
ILIA STATE UNIVERSITY IN GEORGIA
INSTALLATION PLAN
A-U-03
ORIENTAL CONSULTANTS CO., LTD.
1:500
Sep. 2011