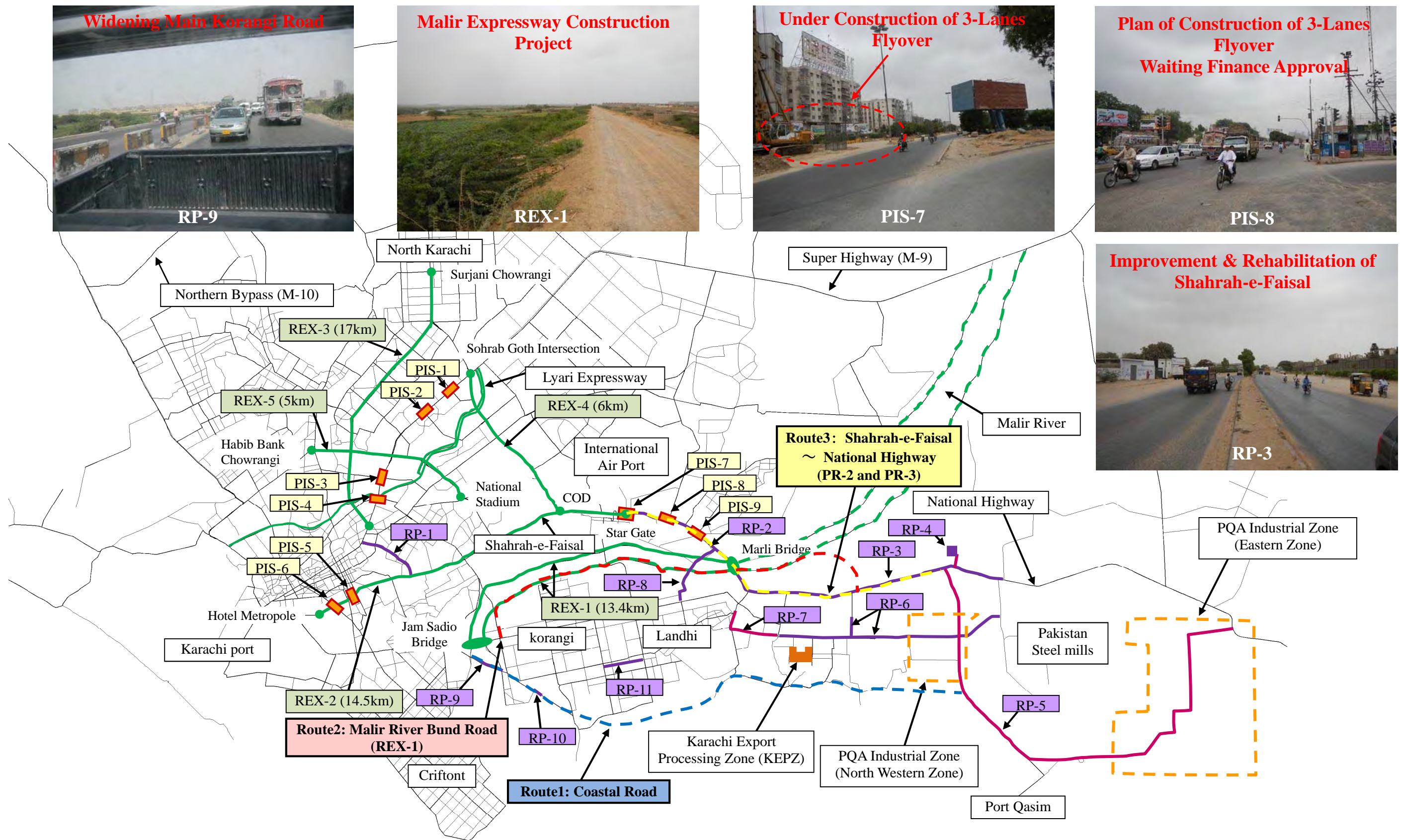


## **APPENDIX 3      BREAKDOWN OF QUANTITIES AND COSTS**

BILL No.	Pay Item No.	Description	Unit	Rate (Rs.)	Rate (USD)	Coastal Road			Malir River Bund Road Route2			Improvement of N-5		
						Estimated Quantity	Amount (Rs.)	Amount (USD)	Estimated Quantity	Amount (Rs.)	Amount (USD)	Estimated Quantity	Amount (Rs.)	Amount (USD)
EARTH WORK	101	Clearing and Grubbing	m <sup>2</sup>	23.76	0.26	678,981	16,135,225	178,294	485,102	11,527,917	127,383	661,267	15,714,294	173,643
	104	Compaction of Natural Ground	m <sup>2</sup>	25.70	0.28	678,981	17,447,219	192,792	485,102	12,465,280	137,741	661,267	16,992,061	187,762
	106	Cutting	m <sup>3</sup>	298.48	3.30	511,772	152,752,854	1,687,919	196,059	58,519,334	646,639	449,526	134,173,762	1,482,620
	108	Filling	m <sup>3</sup>	401.62	4.44	205,592	82,570,901	912,408	797,036	320,109,297	3,537,208	322,064	129,349,022	1,429,307
	<b>Sub Total</b>							269,000,000	2,970,000		403,000,000	4,450,000		296,000,000
SUBBASE AND BASE	201	Granular Sub Base	m <sup>3</sup>	1,161.91	12.84	164,645	191,302,835	2,113,896	119,456	138,797,532	1,533,713	160,065	185,981,886	2,055,100
	202	Aggregate Base Course	m <sup>3</sup>	1,329.37	14.69	129,364	171,971,971	1,900,290	94,782	126,000,584	1,392,306	126,426	168,066,998	1,857,140
	203	Asphaltic Base Course	m <sup>3</sup>	16,177.84	178.77	79,922	1,292,971,730	14,287,338	58,930	953,353,955	10,534,561	78,355	1,267,616,691	14,007,164
	209a	Breaking of Existing Road Pavement Structure	m <sup>3</sup>	554.99	6.13	18,080	10,034,187	110,878	16,672	9,252,763	102,243	49,406	27,419,747	302,988
	209b	Scarification / Grooving of Existing Road Pavement	m <sup>2</sup>	62.17	0.69	90,400	5,620,403	62,105	83,858	5,213,670	57,611	111,949	6,960,160	76,910
	<b>Sub Total</b>							1,672,000,000	18,470,000		1,233,000,000	13,620,000		1,656,000,000
SURFACING	302	Prime Coat	m <sup>2</sup>	100.08	1.11	642,259	64,279,954	710,293	472,395	47,279,248	522,436	628,628	62,915,670	695,218
	303	Tack Coat	m <sup>2</sup>	40.08	0.44	636,259	25,501,969	281,797	470,497	18,858,037	208,381	624,248	25,020,540	276,477
	305	Asphaltic Wearing Course	m <sup>3</sup>	17,432.67	192.63	33,369	581,710,008	6,427,896	30,123	525,116,071	5,802,533	37,456	652,960,461	7,215,213
	<b>Sub Total</b>							671,000,000	7,420,000		591,000,000	6,530,000		741,000,000
FOOTPATH / ISLAND / MEDIAN		Median	m	2,000.00	22.10	22,711	45,421,750	501,910	20,935	41,869,746	462,661	15,271	30,541,566	337,484
	<b>Sub Total</b>							45,000,000	500,000		42,000,000	460,000		31,000,000
DRAINAGE		drainage	m	35,000.00	386.75	22,711	794,880,625	8,783,431	20,935	732,720,555	8,096,562	15,271	534,477,405	5,905,975
	<b>Sub Total</b>							795,000,000	8,780,000		733,000,000	8,100,000		534,000,000
STRUCTURE		Bridge	m <sup>2</sup>	114,159.38	1,261.46	22,080	2,520,639,110	27,853,062	86,940	9,925,016,497	109,671,432	64,680	7,383,828,698	81,591,307
		Reinforced Soil Wall	m <sup>2</sup>	27,147.00	299.97	4,200	114,017,400	1,259,892	69,150	1,877,215,050	20,743,226	9,975	270,791,325	2,992,244
	<b>Sub Total</b>							2,635,000,000	29,110,000		11,802,000,000	130,410,000		7,655,000,000
OTHERS		Pedestrian Bridge	No.	20,000,000.00	221,000.00		0	0	0	0	0	10	200,000,000	2,210,000
		Ramp1	L/S	677,517,654.80	7,486,570.09		0	0	1	677,517,655	7,486,570		0	0
		Ramp2	L/S	2,637,122,669.08	29,140,205.49		0	0	1	2,637,122,669	29,140,205		0	0
		Ramp3	L/S	2,453,237,742.44	27,108,277.05		0	0	1	2,453,237,742	27,108,277		0	0
					0.00		0	0		0	0		0	0
					0.00		0	0		0	0		0	0
					0.00		0	0		0	0		0	0
<b>Sub Total</b>							0	0		5,768,000,000	63,740,000		200,000,000	2,210,000
<b>Construction Cost Total :</b>							<b>6,087,000,000</b>	<b>67,250,000</b>		<b>20,572,000,000</b>	<b>227,310,000</b>		<b>11,113,000,000</b>	<b>122,800,000</b>
RESETTLEMENT		Structures	ft2	600.00	6.63	960,312.10	576,187,261	6,366,869	928,677.00	557,206,200	6,157,129	2,825,028.61	1,695,017,166	18,729,940
					0.00		0	0		0	0		0	0
					0.00		0	0		0	0		0	0
					0.00		0	0		0	0		0	0
	<b>Sub Total</b>							576,000,000	6,370,000		557,000,000	6,160,000		1,695,000,000
LAND ACQUISITION		Coastal Road	Ac	7,000,000.00	77,350.00	9.04	63,264,110	699,068		0	0		0	0
		Malir River Bund Road	Ac	7,000,000.00	77,350.00		0	0	32.45	227,119,711	2,509,673		0	0
		Shahrah-e-Faisal Road	Ac	50,000,000.00	552,500.00		0	0		0	0	6.40	319,815,600	3,533,962
					0.00		0	0		0	0		0	0
	<b>Sub Total</b>							63,000,000	700,000		227,000,000	2,510,000		320,000,000
RELOCATION		High-tension Pylon	No.	44,000,000.00	486,200.00	29	1,276,000,000	14,099,800	2	88,000,000	972,400	0	0	0
		Cable (Telephone & Electric)	km	610,000.00	6,740.50	41.8	25,498,000	281,753	3.0	1,830,000	20,222	55.6	33,916,000	374,772
		Telephone Pole	No.	50,000.00	552.50	42	2,100,000	23,205	19	950,000	10,498	116	5,800,000	64,090
		Electric Pole	No.	300,000.00	3,315.00	216	64,800,000	716,040	44	13,200,000	145,860	194	58,200,000	643,110
		Electric Pole with PMT	No.	450,000.00	4,972.50	22	9,900,000	109,395	6	2,700,000	29,835	19	8,550,000	94,478
		Water	m	75,000.00	828.75		0	0	1,134	85,050,000	939,803	12,787	959,025,000	10,597,226
		Sewerage	m	10,000.00	110.50		0	0	1,082	10,820,000	119,561	2,916	29,160,000	322,218
		Underground Electric Cable	m	50,000.00	552.50	8,828	441,400,000	4,877,470	865	43,250,000	477,913	26,881	1,344,050,000	14,851,753
		Gas Pipe (Coastal Road)	L/S	61,234,950.00	676,646.20	1	61,234,950	676,646		0	0		0	0
		Gas Pipe (Malir River Bund Road)	L/S	19,544,000.00	215,961.20		0	0	1	19,544,000	215,961		0	0
		Gas Pipe (Shahrah-e-Faisal)	L/S	289,477,894.00	3,198,730.73		0	0		0	0	1	289,477,894	3,198,731
		Manhole	No.	50,000.00	552.50	136	6,800,000	75,140		0	0	378	18,900,000	208,845
<b>Sub Total</b>							1,888,000,000	20,860,000		265,000,000	2,930,000		2,747,000,000	30,360,000
<b>The Total Sum</b>							<b>8,614,000,000</b>	<b>95,180,000</b>		<b>21,621,000,000</b>	<b>238,910,000</b>		<b>15,875,000,000</b>	<b>175,420,000</b>

## **APPENDIX 4      ROAD PROJECT IN KARACHI**



Source: JICA Study Team

Figure A4.1.1 Road Project in Karachi

## **APPENDIX 5     Route Map**





Source: JICA Study Team

Figure A5.1.1 Route Map of Maril River Bud Road



## **APPENDIX 6      Concept Paper**

Project Name		Alternative Route 1: Construction and Rehabilitation of Coastal Road	Alternative Route 2: Construction of Malir River Bund Road	Alternative Route 3: Improvement of Sharah-e-Faisal - National Highway
Implementation Agency		Karachi Metropolitan Corporation		
Specifications (Output / Voltage, length etc.)		Length: 26.3km Start Point: Intersection with Creek Avenue on Korangi Road End Point: Port Qasim Access Road	Length: 21.3 km Start Point: Intersection with 3000 feet Road on 8000 feet Road End Point: National Highway at Goth Juman	Length: 15.3 km Start Point: Entrance Road to International Airport End Point: Intersection with Port Qasim Access Road
Project Outline		<ul style="list-style-type: none"> <li>- To construct 6-lanes carriageway.</li> <li>- In order to ensure function of principal arterial road, to construct 2.2 km log bridge Malir River crossing.</li> </ul>	<ul style="list-style-type: none"> <li>- To construct access controlled 6-lane expressway up to Goth Jam Kand of 17.1 km long.</li> <li>- Due to serious impact of resettlement issue on the left side of bund, 4-lane carriage road will be constructed on the left side of bund.</li> <li>- After expressway on bund of Malir River, to construct minor arterial road of 4.2 km long to connect with National Highway.</li> </ul>	<ul style="list-style-type: none"> <li>- To improve existing 4-lane carriageway to 6-lane carriageway road.</li> <li>- To provide service road, in order to separate community access transporting activities from main traffic flow.</li> <li>- To improve major intersections by constructing flyover bridge.</li> </ul>
Present Situation		<ul style="list-style-type: none"> <li>- Preliminary design has not conducted by KMC.</li> <li>- KMC has submitted PC-1 of Malir River Causeway improvement (4-lane) and box culvert construction near CBM, and only box culvert work is under construction.</li> </ul>	<ul style="list-style-type: none"> <li>- A preliminary design used left side band has been conducted by ADB assistance program in 2009 (project cost: 60,479 million PKR).</li> <li>- At present, KMC has different alignment plan to use left and right side band, and preliminary design has not prepared.</li> <li>- PC-1 has not prepared by KMC.</li> </ul>	<ul style="list-style-type: none"> <li>- Flyover construction at 3 locations on Sharah-e-Faisal (total cost: 1,214.5 million PKR) has been submitted. Flyover at International Airport is under construction.</li> <li>- Regarding to the road improvement to 6-lane carriageway, project concept paper to request approval of project implementation has been prepared by KMC. However, E/S or D/D has not commenced yet.</li> </ul>
Required Period for Project		5 years (Preparation: 1 year, Land Acquisition and Relocation: 1 year, Construction: 3 years)		
Estimated Project Cost		US\$ 95,189,589 (PKR 8,614,442,462) Rate: US\$ 1.00= PKR 90.498	US\$ 238,916,542 (PKR 21,620,863,512) Rate: US\$ 1.00= PKR 90.498	US\$ 149,197,077 (PKR 13,501,997,916) Br1: US\$62.78, Br2: US\$8.89, Br3: US\$10.25, 6 Lanes Improvement: US\$14.66 (Unit: US\$ Million) Rate: US\$ 1.00= PKR 90.498
Expected Outcome	Benefit expected	<ul style="list-style-type: none"> <li>- This route may connect with Port Qasim directly, and will perform as an alternative route of Sharah-e-Faisal / National Highway and 8000 feet Road of Korangi / Landhi Town.</li> <li>- Coastal Road will be a part of Outer Ring Road in accordance with KSDP-2020.</li> </ul>	<ul style="list-style-type: none"> <li>- Due to access controlled expressway, smooth traffic will be expected without traffic congestion at intersection.</li> <li>- The project is given higher priority in KSDP-2020.</li> </ul>	<ul style="list-style-type: none"> <li>- Traffic capacity will increase by adding a lane, release congestion and lead a smooth traffic.</li> <li>- Congestion will release by separating main through traffic and local traffic associated with providing service road.</li> </ul>
	Required additional study	<ul style="list-style-type: none"> <li>- Topographic survey in order to set ROW in concrete</li> <li>- Geological Survey</li> <li>- Feasibility study of road</li> </ul>	<ul style="list-style-type: none"> <li>- Topographic survey in order to set ROW in concrete</li> <li>- Geological Survey</li> <li>- Hydrological survey of Malir River</li> <li>- Feasibility study of road</li> </ul>	<ul style="list-style-type: none"> <li>- Topographic survey in order to set ROW in concrete</li> <li>- Geological Survey</li> <li>- Feasibility study of road</li> </ul>



Project Name		Project No.5 : Korangi Combined Cycle Power Plant (KCCPP) (Conversion of Open mode unit to combined cycle mode)	Project No.6 : Korangi Gas turbine Power Station-II (KGTPS-II) (Addition of combined mode)	Project No.7 : S.I.T.E Gas turbine Power Station-II (SGTPS-II) (Addition of combined mode)	Project No.10: Renovation of Distribution Line
Implementation Agency		Karachi Electricity Supply Company (KESC)			
Specifications (Output Voltage, length etc.)		Addition of 26 MW output	Addition of 10 MW output	Addition of 10 MW output	Renewal and augmentation of 5% of existing distribution lines <ul style="list-style-type: none"> <li>- 11 kV Distribution lines of 350 km.</li> <li>- 400 Distribution lines of 586 km.</li> <li>- 50 kVA Distribution transformers of 300 sets</li> <li>- 20 kVA Capacitors of 300 sets</li> </ul> (This project scope is tentative.)
Project Outline		- To renovate units-1 & 2 to the combined cycle mode by providing Heat Recovery Steam Generator (HRSG) and steam turbine generator of 26 MW. No additional fuel consumption is required.	- To equip each two sets of existing engine generators with one HRSG for converting the existing generators to combined cycle mode. Since there are 32 engine generators, 16 sets of HRSGs are necessary. Those HRSGs are to be connected to one steam turbine generator to generate approximately 10 MW power without consumption of additional fuel.	- To equip each two sets of existing engine generators with one HRSG for converting the existing generators to combined cycle mode. Since there are 32 engine generators, 16 sets of HRSGs are necessary. Those HRSGs are to be connected to one steam turbine generator to generate approximately 10 MW power without consumption of additional fuel.	- By upgrading the conductor size of the existing 11 kV distribution line, distribution loss can be reduced. Since KESC does not have specific design, tentatively 5% of KESC's 11 kV distribution lines are targeted in this study. - Similarly, 5% of KESC's existing low voltage lines are replaced by larger sized insulated conductors to avoid power theft. - 50 kV distribution transformers and 20 kVA capacitors are also to be provided to reduce the distribution loss. (This project scope is tentative and variable.)
Present Situation		- At present, 4 units of 48.4 MW gas turbines. Among them, units-1 & 2 operate in open cycle mode, and units-3 & 4 operate in combined cycle mode with one 26 MW HRSG and a steam turbine generator. - Since the project is to apply the same renovation to the remaining 2 units, preparation of new design is not required. Only manufacturing drawings may be enough.	- In the existing station, 32 units of 2,739 MW engines are operating. - The project is to renovate all those engines in open cycle mode into combined cycle mode.	- In the existing station, 32 units of 2,739 MW engines are operating. - The project is to renovate all those engines in open cycle mode into combined cycle mode.	- Only the concept of the "Renovation of distribution line" exists, and there is no specific scope of the project. No basic design has been prepared.
Required Period for Project		3 years (1 year for preparation, 2 years for design, manufacturing & construction)	3 years (1 year for preparation, 2 years for design, manufacturing & construction)	3 years (1 year for preparation, 2 years for design, manufacturing & construction)	7 years (1 year for preparation, 5 years for design, manufacturing & construction, and 1 year for dismantling existing lines)
Estimated Project Cost		USD 44,000,000	USD 24,000,000	USD 24,000,000	USD 100,000,000 (Scope of Project can be variable)
Expected outcome	Benefit expected	- Increase of installed capacity of generation, then decrease of load-shedding (the project can be equivalent to construction of new 26 MW power station)	- Increase of installed capacity of generation, then decrease of load-shedding (the project can be equivalent to construction of new 10 MW power station)	- Increase of installed capacity of generation, then decrease of load-shedding (the project can be equivalent to construction of new 10 MW power station)	- Decrease of existing distribution loss by 0.5% (the project can be equivalent to construction of new power station with capacity of approximately 15-20 MW).
	Required additional study	- Feasibility study	- Feasibility study	- Feasibility study	- Basic design including route survey for determination of the project scope - Feasibility study