	Iraq

[Iraqi Trust Fund]

ANNUAL PROGRAMME[1] NARRATIVE PROGRESS REPORT

REPORTING PERIOD: 1 JANUARY – 31 DECEMBER 2009

Submitted by: Nimal Vijaindu, Senior Technical Advisor, UNDP, Telephone: +962796229133 Email: nimal.vijaindu@undp.org	***Country and Thematic Area[2]*** Iraq Economic Recovery
Programme No: E4-15 *Atlas Award No.:* 54984 ***MDTF Office Atlas No:*** 66984 ***Programme Title:*** Rehabilitation of Mussayib Gas Power Station - Phase II	***Participating Organization(s):*** UNDP
Implementing Partners: • *International Organizations, including NGOs* None • National (government, private, NGOs & others) Ministry of Electricity, General Directorate for Electricity Production Euphrates Region, Hilla; Mussayib Generating Station	***Programme Budget (from the Fund):*** *For Joint Programme provide breakdown by UN Organization* UNDP: US$ 33,000,000

[1] The term "programme" is used for programmes, joint programmes and projects.
[2] E.g. Priority Area for the Peacebuilding Fund; Thematic Window for the Millennium Development Goals Fund (MDG-F); etc.

Programme Duration (in months):
Start date[3]: 1 April 2006 (Award start date)
End date: anticipated December 2011

- *Original end date*

Original programme/project duration 24 months till June 2007.

- *Revised end date, if applicable*

Timeline extended till December 2009.

- *Operational Closure Date[4], if applicable:*

Expected completion date December 2011 if co-funding becomes available early 2010
Budget Revisions/Extensions:
11 June 2007 Budget Revision/Extension till June 2009
12 February 2008
1 April 2009

[3] The start date is the date of the first transfer of funds from the MDTF Office as Administrative Agent.
[4] All activities for which a Participating Organization is responsible under an approved MDTF programme have been completed. Agencies to advise the MDTF Office.

NARRATIVE REPORT FORMAT

I. Purpose

- Main outputs and outcomes/objectives of the programme.

Key Immediate Objectives:

The immediate objective is to bring Mussayib Power Station Unit 1 to greater output and reliability reflecting its design capacity (300MW) under a co-share arrangement with the Ministry of Electricity. Under Stage II, which follows the condition assessment and preliminary refurbishment done in Stage I, the previously identified rehabilitation/repairs of the boiler and balance of plant impacting Unit 1 operation will be completed. In addition, the technical capabilities of the plant staff to operate and maintain the unit will be built to undertake repair and maintenance work with minimum international supervision. Within the co-share arrangement there are discussions amongst the Ministry of Electricity, the Embassy of Japan and UNDP that there be a change in scope as the Ministry of Electricity is prioritizing Unit 4 for rehabilitation as the condition of this unit has deteriorated with a full collapse during December 2009.

Development Goal and Immediate Objectives
1. To respond to the immediate humanitarian needs of war-affected Iraqi people through ensuring reliable and safe electricity supply to all consumer categories, in particular key humanitarian essential services. 2. The generating capacity, reliability, availability, and efficiency of Unit No.1 of Mussayib Thermal Power Station increased. 3. Plant staff able to conduct complete maintenance and full repairs of thermal units utilizing latest available technology, modern tools, and state-of-art software for unit maintenance and overhauls. 4. Core team of MoE staff specialized in the overall condition assessment of thermal units trained in the application of state-of-art maintenance management software for monitoring, recording, reporting and planning future maintenance of thermal units in the MoE Fleet.

Outputs, Key activities and Procurement	
Outputs	1.1 Mussayib Thermal Power Station (TPS) Unit 1 rehabilitated and providing 60-80 MW greater capacity, reliability, availability and efficiency by June 2007. 2.1 Comprehensive set of selected and essential spare parts supplied to Mussayib TPS, which will be available in stock for emergency repairs and routine maintenance; in order to sustain Unit 1 future generation and reliability. 3.1 Thirty-four (34) plant staff trained in Unit 1 rehabilitation skills suited for erection, calibration, testing and commissioning. In addition, a core team of

	MoE staff proficient in the application of maintenance management software and able to train other junior technical personnel to enlarge MoE in-house capabilities in maintenance management, planning, monitoring and record keeping.
Activities	1.1.1 Finalization of the list of equipment, parts and relevant components with their detailed technical specifications to be provided based on assessments of the unit. 2.1.1 Unit repair and rehabilitations work conducted by plant staff under contractor guidance. 3.1.1 Implementation of the relevant training overseas for unit rehabilitation work and the training on maintenance management software in Amman, Jordan.

Outputs:

- Programme relationship to the Strategic (UN) Planning Framework guiding the operations of the Fund.

  <u>UN Assistance Strategy for Iraq</u>

  UN Cluster 4 Infrastructure and Results Matrix Housing
  There is an articulated for efficient operation, management and maintenance of an electric network with increased availability to the population through rehabilitation of the grid and overall electric generation capacity. This sector further elaborates that the Ministry of Electricity has the capacity to increase capacity, repair and maintain power generation.
  The relevant excerpt from the 2006-2007 UN Assistance strategy for Iraq is as follows:

  UNCT Goal 2: Assist in the provision of basic services and promotion of community development and participation:
  Cluster Outcome 2.6: Rehabilitation and governance of infrastructure at local level.
  E3: Increased availability of electricity, particularly to rural and low income areas.
  Programme outputs:
  -Generation capacity enhanced;
  -Technical and management capacity enhanced;
  -Power plant equipped with sufficient spare parts for operation and maintenance;
  -Maintenance Manuals and drawings for ready reference in efficient operation and maintenance.

  <u>UN Millennium Development Goals (MDG)</u>

  MDG 7 Target 11 states that significant improvements of people living in slums are not or partially connected to services like water, sanitation and electricity.

  <u>Iraq National Development Strategy</u>

The Rehabilitation at Mussayib is based on Pillar 2 10 that prioritizes increasing electricity generation and distribution to meet current and projected needs. Within the document it is acknowledged that there is a shortage caused by numerous problems such as sabotage, looting, lack of security for workers, lack of training and obsolete technologies. It is also acknowledged that Baghdad accounts for over 40% of the Iraqi power load. One of the planned goals on page 38 refers to two actions specific to this project, which are: 1) Reconstruct power network, increase power generation and guarantee a continuous supply, and 2) Update power distribution.

The International Compact with Iraq (ICI)

The rehabilitation of Units to generate electricity at Mussayib Thermal Power Plant links into several components of the ICI. Section 4 Realising the Vision-the Socio-Economic Context in point 2; Revitalize the private sector, particularly through the creation of an enabling environment, and point 3; Improve the quality of life starting with the provision of basic services. This is further elaborated in the section 4.5 Energy (Oil, Gas and Electricity) on page 20-21.

4.5 Energy Goal is: "The Government will develop an energy sector that meets Iraq's needs and maximizes the benefits of hydrocarbons for all Iraqis and reinforces national unity and institutions." The goal is further discussed with the Government of Iraq to develop an Energy Master Plan on the basis of an Energy Balance…for the electricity sector, the Government will formulate a plan for least cost development of the power system…. The Mussayib Thermal Power Plant links directly into these actions, which are activities within the larger UNDP infrastructure projects.

The Draft National Development Plan

The draft National Development Plan is the Government of Iraq's priorities for 2010-2014. At present this project is aligned.

The Draft UNDAF

The UN Country Team worked closely with the Government of Iraq in the development of a Common Country Assessment during 2009, which has been approved. The UN Country Team has developed a draft UNDAF for 2011-2014. This project sits within priority 4 within 4.4. *People in Iraq have improved access to safe water, sanitation, electricity and municipal services*.

The Draft UNDP Country Programme Document

UNDP has submitted to the Board Secretariat a draft UNDP Country Programme Document for 2011-2014, which harmonizes with the draft UNDAF that has gone through a consultative process. This project sits in outcome 5.

II. Resources

Financial Resources:

- Funding resources available to the project.

  The Government of Iraq agreed to co-share up to a ceiling of US $20 million in 4th Quarter 2008. However, due to the international financial crisis and the resultant fall in oil prices, the Ministry of Electricity could not realize this commitment. The Government clarified in 4th Quarter 2009 that during financial year 2010 that they will allocate funds in line with this project agreement.
  - Two budget revisions have been submitted and agreed: 11 June 2007 and 12 February 2008.
  - A time extension request was put in on 1 April 2009.

- Good practices, constraints in the mechanics of the financial process, bottlenecks and coordination.

  This is co-share project with the Government of Iraq.

  UNDP, based on the initial estimated cost received from Hitachi in 2004-2005, reserved US$13 million aside for rehabilitation of Unit 1. This reserve was based on the assumption that the implementation work was to be carried out by MoE appointed contractors. The MoE requested that Hitachi directly hire a contractor to undertake the implementation, with a new price quotation of US$38 million in July 2008. After careful study of the quotations, available funds and identification of several implementation modalities, options for implementation were presented to the Minister of Electricity. An agreement to co-share with the Ministry of Electricity was made with a cap of US$20 million, which is anticipated to be available during financial year 2010.

Human Resources:

National Staff:

One Project Engineer

International Staff:

One Project Manager

Support functions co-shared on pro-rated basis.

III. Implementation and Monitoring Arrangements

- Implementation mechanisms utilized and adapted.

  The implementation modality significantly shifted in 2008 with the decision by the Ministry of Electricity to change the operating context. The original design was to do a direct hire but the MoE requested Hitachi to become the contractor, which made the costs three times higher. This caused a shortfall of funding in which the MoE agreed to co-share as long as an international company was used. All partners anticipated that the costs would be reduced within the rehabilitation component of the project.

  The innovative process used in the successful completion of the other power plants will continue to be used in remote management.

- Procurement procedures utilized and variances.

  This project required a variance as the equipment required was highly specific and technical. Submitted quotations and price proposals were analyzed and compared to world market benchmarks by international consultant companies to assure best quality for money. Procurement was made by the experienced UNDP Iraq Procurement Office, which follows agency procurement procedures.

- Monitoring and lessons learned.

  The original site work implementation was to initiate during 3rd Quarter 2009 after all parts, equipment and goods needed for rehabilitation were delivered to the site.

  During 2nd Quarter 2009 all parts, equipment and goods were delivered to the site. Inspectors checked at factories and during shipping with a final quality control check by the MoE upon arrival at the Mussayib Power Plant site.

  The MoE requested a change in the original contracting modality, which presently is affecting works.

  When implementation works initiate they will be monitored on a regular basis. A web camera system of fixed and mobile cameras have been installed both in the UNDP-Iraq Office in Amman and on the site of work. This link has been used successfully used in other electricity projects and facilitates day to day discussions and also the web camera is taken to the precise point of work for close monitoring. The system is on throughout the working time and ensures that the sub-contractors for rehabilitation works complied with instructions and acceptable procedures of works.

  As soon as a Red Zone movement can be arranged, UNDP will visit the site to monitor and verify the storage of parts, equipment and goods.

- Assessments and evaluations undertaken.

  Unit 1 at the Mussayib Power Station has received an overall cold assessment with information reviewed by MoE, Hitachi/Hyundai in Amman on 25-29 September 2005. The comprehensive technical data gathered at the Mussayib Power Station plus equipment pictures obtained during the cold assessment are with UNDP and have been reviewed by Hitachi/Hyundai, MoE and UNDP specialists. A Final Assessment Report was generated on this basis, which included recommendations for the rehabilitation of Unit 1.

  An *Outcome Evaluation of UNDP Governance, Crisis Prevention and Recovery and Poverty Reduction Initiatives in Iraq* in June 2009 was conducted. One of the outcomes addressed was electricity. Within Recovery and Crisis Prevention twenty-seven projects were assessed, with thirteen of the projects within the electricity sector. It was noted that an output regarding the severity of infrastructure damage in 2003 was that the power plants could generate only a fraction of the power supplied previous to this time. It was noted that electricity production was higher in the second half of 2008 than two years earlier, but the gap between demand and

production may have significantly increased. The Evaluation stated that "it appears there may have been some habituation…it would appear that availability of service increased, particularly in Baghdad". Building capacity and national ownership was an area elaborated in the Evaluation, noting that in the ministries when training of technical skills and capacity was developed that persons departed the position going to other international agencies or shifted to other positions. This fluidity of brain drain impacted several of the RCP projects but most notably the electricity projects.

At the end of rehabilitation additional assessments will be conducted.

Electricity is a priority for families in Iraq as identified in the *Results of Field Survey for Needs and Opinions of the Poor in Iraq* by Khalid Hantoush Sachet (Sept 2008). This survey identified that the need for electricity was the most requested need with 22.3% out of 11,198 families represented in ten (10) Governorates.

IV. Results

- Programme progress in relation to planned outcomes and outputs.

A series of three options on this project were presented to the Minister of Electricity in late 2008. Based on the recommendations by the Minister and his agreement to co-share costs for the rehabilitation of Unit 1, UNDP commenced negotiation with the Government of Japan to initiate the implementation work by an international contractor. During 1st Quarter 2009 UNDP shortlisted potential contractors for the boiler installation works and consultants for construction supervision of the project.

During 2nd Quarter 2009 the last shipment was delivered, which completed the procurement of parts, equipment and goods. The last delivery arrived at the site in May 2009.

The Federal Budget for 2009 was reduced by the Government of Iraq four times due to the financial crisis and the sharp decline in international oil prices. As a result of the budgetary cuts, the Ministry of Electricity informed UNDP that it would not be able to provide the funds during 2009 as previously agreed, due to shortfall in the revenue of the Ministry. At this juncture the implementation of the project became uncertain and initiated further discussions with partners to find solutions on how to move forward.

Multiple discussions initiated to find ways forward for the rehabilitation at Mussayib Power Plant. Of note was meeting with the Ministry of Electricity (MoE) and the Embassy of Japan on 3 September 2009 in Amman. The purpose of this meeting was to discuss the options and reach a solution to complete the project scope. MoE, due to the defect that appeared in Unit No. 4, requested the approval of using the parts imported for Unit No.1 on Unit No.4. The Embassy of Japan pointed out this would deviate from the original project scope within the agreement. The Embassy of Japan requested MoE to complete a list of questions after consultation with His Excellency the Minister of Electricity, as this information was required to facilitate understanding and further

negotiations for both UNDP and the Embassy of Japan in their respective presentations to Tokyo and the Multi-Donor Trust Fund Steering Committee.

His Excellency the Minister of Electricity sent a letter 3rd Quarter 2009 providing a new financial commitment for cost sharing in providing funds to Mussayib Power Station of up to USD$8.0 million for rehabilitation of Unit 4 initiating in 2010. Based on the lessons learnt UNDP decided to: Obtain funds from MoE before committing to the procurement process; Review and ensure that an adequate number of bidders would participate in the procurement process; Work with the MoE to establish a dedicated team at Mussayib for managing the project.

The geographical isolation coupled with difficult security conditions make communication and planning on this technically complex project extremely difficult. Due to this isolation it may be difficult to identify contractors and consultants.

The supervision and management will be carried out once works initiate using successful techniques and lessons learned that were implemented in the Mosul and Taji Power Plant projects that are now successfully completed. One of the innovative methods has been using communications in a creative way that involves teleconferencing and using audio/video/telecom links (AVT) directly at the job site and directly mentoring through this technique. UNDP has employed an Audio/Video/Telecom (AVT) satellite-based system to communicate live with Mussayib Power Plant and at the General Directorate for Electricity Production in Hilla.

- Key outputs achieved in the reporting period.

Quantitative achievements against objectives and results			
Completion of activity 1 that involved assessment of need for rehabilitation and initiation of procurement	Determining scope of rehabilitation needed, included full negotiation of prices and delivery schedules (Activity 1).	**% of planned**	100
Pre-shipment inspection	Coordination and supervision of factory-witness tests in Japan of selected equipment successfully completed during March – April 2006.	**% of planned**	100
Spare parts and equipment	135 tons of equipment delivered to site.	**% of planned**	100
Training of Trainers	Specifications for training prepared. 10 engineers trained.	**% of planned**	25
Installation works	Discussions at present suggest that a different Unit (4) will be rehabilitated,	**% of planned** The first	0 As

	which has ceased operation. If agreement is realized then installation will require a shift back to the beginning steps of this task. This change of scope rests on the realization of the funding from MoE and the agreement by the donor partner, who is actively engaged in discussions. Additional spare parts may be required.	bidding process was completed for short listing contractors during 2009.	have to start over

- Delays in programme implementation, the nature of the constraints, actions taken to mitigate future delays and lessons learned in the process.

  The realization of the co-funding by the Ministry of Electricity is the main issue delaying the project. The funding co-share is subject to the budget allocation to the Ministry of Electricity from the Federal Budget for 2010. Due to the elections at the end of the quarter, in March 2010, there could be delays in the release from the Federal Budget.

  The collapse of Unit 4 at Mussayib Power Plant in December 2009 and the actions to shift the project scope from Unit 1 to Unit 4 is in process, with a foreseeable delay if there are hesitations with the Iraq Trust Fund or within the Ministry of Foreign Affairs in Japan.

- Key partnerships and collaborations, and impact on the achievement of results.

  This project is at a sensitive level. All partners have been involved in the negotiations at the relevant junctures throughout 2009, including the Ministry of Electricity, Embassy of Japan, Iraq Trust Fund and UNDP.

  The relationships of these partners and their potential impact on the results for the rehabilitation works are significant. The realization of the co-financing commitment by the Ministry of Electricity is necessary for works to initiate. Once this matter is sorted out, then a request for extension of time will be submitted to the Iraq Trust Fund and permission required to proceed. This will also require approval by the Embassy of Japan and Ministry of Foreign Affairs.

  The change in the scope of works from Unit 1 to Unit 4 from the Ministry of Electricity is anticipated in early 2010. The relationship of partners and their potential impact on the results are significant as the Iraq Trust Fund, the Embassy of Japan and the Ministry of Foreign Affairs would need to have no objection to this change of project scope.

- Highlights and cross-cutting issues.
  - On the Millennium Development Goals (MDGs): One of the focal areas for UNDP is the MDGs. This project directly relates to MDG 7, Target 11, which refers to achieve significant improvements for people living in slums that are not; or only partially connected to basic essential services including water, sanitation and electricity.

- One of the priorities of the Government of Iraq and surveys of the general population in Iraq is the need for electricity. The stability of electricity and length of power cuts have a direct implication on building a private sector and also on both national and foreign investment.
- The environment should be improved as the gas emissions for Mussayib Power Station will be reduced with the repairs on the Unit. As Iraq is a new signatory to the Kyoto Protocol, this will assist in meeting its responsibilities.
- The availability of electricity assists all gender groups in Iraq with a particular note on women and income generation projects with a note for access to water in the home.
- The Mussayib Power Station is responsible for 4.5 per cent of total electricity throughout Iraq.
- Correcting the problems in either Turbine Unit 1 or the new discussions of Unit 4, which has collapsed could increase Iraq's power generation capacity 18 per cent.
- This project will directly create employment opportunities, while numerous employment opportunities will be created as a result of restoration of the power supply.
- Direct beneficiaries in the future: Approximately five million (5,000,000) inhabitants through the National Electricity Grid.
- Capacity is to be developed in tandem as there has been training of Iraqi specialists and the rehabilitation will use live mentoring and monitoring of works through AVT teleconferencing. Periodic project meetings continue to be held in Amman to strengthen capacity, address project challenges and the constraints of remote management.

V. Future Work Plan

- Projected activities and expenditures for 1 January 2010 till 31 December 2010.

  Letters for change of scope will need to be developed to change the scope from Unit 1 to Unit 4, which has collapsed, and agreed upon, by the Embassy of Japan, ITF and UNDP.

  The co-share funding will have to be ensured before any contracting actions can be initiated.

  Once this co-funding is confirmed the following actions would be initiated:

  - Permission request submitted to ITF requesting time extension and permission provided to continue the implementation of the project
  - Short-listing of international companies to undertake implementation work
  - Preparation of RFP bidding
  - Contract award for implementation work
  - Selection of Owner's Engineer for site supervision
  - Selection of a QA Inspector to ensure the performance of the boiler work
  - Initiate rehabilitation of the boiler

- Adjustments in strategies, targets or key outcomes and outputs planned.

  There is an anticipated change of scope in the works for 2010, changing from Unit 1 to Unit 4, which collapsed completely during December 2009. Requests from the Ministry of Electricity have been received.

VI. Performance Indicators[5]

Annual Performance Indicators Assessment for the Year 2009.

	Performance Indicators	Indicator Baselines	Planned Indicator Targets	Achieved Indicator Targets	Means of Verification	Comments (if any)
1. IP Outcome: The generating capacity, reliability, availability and efficiency of Unit No. 1 of Mussayib thermal Power Station increased.						
IP Output 1.1 Mussayib Thermal Power Station (TPS) Unit 1 rehabilitated and providing 60-80 MW greater capacity, reliability, availability and efficiency.	Indicator 1.1.1 Finalization of the list of equipment, parts and relevant components with their detailed technical specifications to be provided based on assessments of the unit.	During the 1st Gulf War Mussayib TPS was subjected to heavy missile attacks and aerial bombardment, which inflicted severe damage to the plant with Units 1 and 2 main control room and Unit 1 main transformer completely destroyed.	To obtain greater power output from Unit 1 and to eliminate or minimize problems caused by unreliable operation. Produce 60 or more MW of electricity from Unit 1. Arrest deterioration and bring about extension of	Funding not adequate for original contractor New way forward identified and agreed in December.	Inspection visits and verifications made by UNDP engineers or consultants in close co-operation with Mussayib TPS engineering staff. Regular contacts are being maintained by telephone and e-mail to confirm the latest operating status of the	Estimated costs for original contractor was earmarked, but operating context structure changed, costing significantly more. Three options explored, with H.E. the Minister of Electricity selecting one option. UNDP initiated negotiation and short listing of potential contractors. The Ministry could not realize co-share

[5] E.g. for the UNDG Iraq Trust Fund and the MDG-F.

			Remaining Useful Life		units. Technical Tests to include: AVR dynamic characteristic and synchronizatio n test; Load operation test; Reliability test; Certificate of Final Completion.	of costs due to reduction of revenue at MoE for 2009. Multiple discussions on way forward initiated. Commitment received from HE MoE that cost sharing up to USD $8 million during 2010. Change of scope requested in 3rd Q as identical Unit 4 deteriorated and completely collapsed in 4th Q 2009.
2. IP Outcome: Plant staff able to conduct complete maintenance and full repairs of thermal units, utilizing latest available technology, modern, tools, and state-of-art software for unit maintenance and overhauls.						
IP Output 2.1 Comprehensive set of selected and essential spare parts supplied to Mussaib TPS, which will be	Indicator 2.1.1 Unit repair and rehabilitations works conducted by plant staff under contractor	Lack of spare parts and severely damaged plant.	Parts, materials and components for use in future for maintenance and repair in store.	Delivery of 135 tons of spare parts and equipment. Shipment 2 and 3 arrived 3rd and 4th Q 2008.	Photos and documents to items received. Factory test reports and Cargo	All spare parts supplied. Monitoring of spare parts and verify storage as soon as Red Zone movement can be

available in stock for emergency repairs and routine maintenance; in order to sustain Unit 1 future generation and reliability.	guidance.			Arrangement of waiver of custom letters and monitoring of security ignored while the cargo was in transit achieved, requiring constant liaison and monitoring. Final shipment of parts and equipment arrived in 2nd Q 2009.	inspectors' reports. Monitor of store and use of spare parts.	arranged.
3. IP Outcome 3 Core team of MoE staff specialized in the overall condition assessment of thermal units trained in the application of state-of-art maintenance management software for monitoring, recording, reporting and planning future maintenance of thermal units in the MoE Fleet.						
IP Output 3.1 Thirty four (34) plant staff trained in Unit 1 rehabilitation skills suited for erection, calibration, testing and commissioning.	Indicator 3.1.1 Implementation of the relevant training overseas for unit rehabilitation works and the training on	Limited capacity of MoE staff to conduct repair and maintenance.	Iraqi engineers better able to operate and maintain Unit 1 to its best capabilities and standards.	Five (5) Mussayib engineers trained on Auxiliary Equipment in Japan. Five (5) trainees	Monitoring skills through tele-Conferencing. Evaluation/ assessment reports by the trainers.	

In addition, the Core Team of MoE staff proficient in the application of maintenance management software and able to train other junior technical personnel to enlarge MoE in-house capabilities in maintenance management, planning, monitoring and record-keeping.	maintenance management software in Amman Jordan.			participated in training on instrumentation and control for the implementation of installation and commissioning of equipment in Japan during reporting period.	Monitoring attendance and skills gained and use at the power plant in the future.	

VII. Abbreviations and Acronyms

- List the main abbreviations and acronyms that are used in the report.

AVT: Audio-Video Teleconferencing System
EoJ: Embassy of Japan
GDEP: General Directorate, Euphrates
HE MoE: His Excellency the Minister of Electricity
MoE: Ministry of Electricity

HTC: Hitachi Co. Ltd.
MDGs: Millennium Development Goals
MoE: Ministry of Electricity
MW: Megawatt
TPS: Thermal Power Station