

## **Generation**

### **a ) UPPER KOTMALE HYDRO POWER PROJECT**

The 150 MW power plant of Upper Kotmale will annually generate 409 GWh. The total estimated costs of the Project are JY 23,329 million and Rs. 12,828 million. The Project is expected to complete by December 2010.

The Contract Lot 1 for Preparatory Work between CEB and Maeda Corporation, Japan was signed in July 2005. The contractor commenced the work in September 2005. Under this, access Roads, permanent facilities for re-settlers, Engineer's and Employer's camp are in progress. The 33 kV Construction Supply was energised in April 2007.

The contract for Lot 2 Main Civil Works was awarded to the Maeda-Nishimatsu Joint Venture, Japan on December 06, 2006 and the contractor mobilized at the site on January 01, 2007. Under this contract, excavation of diversion tunnel is almost complete. Construction of right bank and left bank roads are also under construction. Excavations and preparatory works for Intake Dam, Power Cavern, adits and other main structures are also in progress.

Bids for Contract Lot 3 Hydro-Mechanical Works were received in August 2007. CAPC approval is awaited. For Lot 4 Electro Mechanical Works, JBIC concurrence and CAPC approval have been received for Bids documents in July 2007. Bids have been invited in July 2007, and will close in September 2007.

Transmission Line route survey was completed in August 2006. The route has now been finalized and D-Notices were issued in August 2007.

### **(ii)Environmental Management**

Draft Report on Bio Diversity Assessment was received. The final report on landslide mitigation was also received. Implementation of the recommendations of the Bio Diversity study will continue. Similarly, monitoring of the ground and surface water quality on weekly basis is continued.

### **(iii)Watershed Management Plan**

Implementation of Watershed Management Plan will commence in 2007. Procurement of instruments for Flow Measurement is under way. Gauging station at Kotmala Oya will be installed and hydrological monitoring will be commenced.

Improvement of poorly managed tea land /afforestation will continue with the Forest Department and Plantation Companies. Two pilot scale afforestation

programmes have been commenced at Nagasena and Logie Estates. Conservation-oriented agricultural practices will be continued to small-scale farmers within the upper catchments of the project area. Training and environmental awareness programs for Schools will also be initiated again.

#### **(iv)Resettlement**

Resettlement Action Plan (RAP) has already been published. Agreement on housing entitlements has been already handed over to the Nanu Oya Community (21 houses). SLR quarters also have been handed over to Sri Lanka Railway. A Micro Credit revolving fund to be established shortly.

Houses: The people of the land coming within the inundated area, who are presently living in houses without basic amenities, will benefit by the project and they will be given houses with electricity, water supply sanitation and other facilities.

Buildings: Kovils, Churches, the UC Building, Rest House, Cinema hall, Tamil School and few business premises will be constructed in place of present buildings, which come under the inundated area.

Roads:The road network of the project area will be developed according to the needs of the project. Two new bridges will be constructed near Talawakelle town facilitating traffic movement to Pundal Oya and Great Western area.

Job opportunities: Group of youth and house wives were selected, giving priority to the affected families, and were trained on Electrical Wiring, Plumbing, Heavy Machinery maintenance, Computer, Dress Making etc.. There will be opportunities for the unemployed persons in the area to involve in the development activities of the project. The potential for the self-employment opportunities will also be increased during the construction period of the project.

#### **(b)REHABILITATION OF NEW LAXAPANA & WIMALASURENDRA POWER STATIONS**

Under the Hydro Power Optimization programme, the consultants J-Power of Japan has carried out studies during years 2004 to 2006 to identify the rehabilitation requirement of Hydro Power Stations in Kelani River Basin. Accordingly, the scopes of the rehabilitation were identified for New Laxapana (which has an installed capacity of 2x50MW and average annual generation about 470GWh) and Wimalasurendra (Built in 1965, which has an installed capacity of 2x25 MW and an annual generation about 80GWh) Power Stations.

Since the ALSTOM France is the Original Equipment Manufacturer for both these stations, Cabinet of Ministers Approval was granted in September 2006, to

enter in to negotiated contract with ALSTOM, France. The contract is expected to be awarded in December, 2007. Funds will be arranged through Calyon Corporate & Investment Bank, France & Hatton National Bank, Sri Lanka on Export Credit basis.

#### **(c) OLD LAXAPANA POWER STATION REHABILITATION**

This is the oldest Power Station in Sri Lanka. This has an installed capacity of 25MW comprising of three 8.33 MW Pelton turbine driven horizontal shaft Generators and has annual generation of about 120GWh. When carrying out studies to identify the scope of rehabilitation requirement of this power station, the consultants J-Power of Japan has identified the reliability of the power plant was low due to its age and poor in efficiency due old design techniques and identified uprating of and efficiency improvement possibilities for this power plant. Accordingly recommended to replace all three turbines and generators and some auxiliaries.

In December 2006, Cabinet of Ministers approval has been given to invite a detailed Technical & Commercial proposal from Voith Siemens, Germany. Detailed specifications are now being drafted in order to invite a proposal from Voith Siemens of Germany. The funds will be arranged from Kreditanstalt for Wiederaufbau (KfW), Germany.

#### **(d) UKUWELA POWER STATION REHABILITATION**

Ukuwela Power Station was the first power station constructed under the Mahaweli diversion scheme by the Mitsubishi Corporation; Japan in 1976 which was having annual average generation of 169 GWh. Due to ageing, this power plant faces more outages and breakdowns during its operation. Therefore, with the assistance of the Mitsubishi Corporation, Japan, the Original Equipment Supplier, a study was carried out. And accordingly, it has been proposed to undertake a complete rehabilitation of power plant in order to improve reliability, efficiency, reduce the cost of maintenance and avoid abandoning of power plant due to non availability of spares due to obsolescence. Hence, Board approval and Cabinet of Ministers Approval were obtained to carry out the rehabilitation project.

After negotiating with Mitsubishi Corporation, on recommendations of CANC, Cabinet of Ministers approval was granted in February 2007 to enter in toa contract with Mitsubishi Corporation at a total cost of Rs. 1,600 million. But due to the unsuccessful in funding arrangement with JBIC, contract was not signed to date. Now CEB is studying alternative arrangements in this regard.

## **Coal Power Development**

### **(a)PUTTALAM COAL POWER PROJECT**

The Contract has been signed in March 2006, between the Ceylon Electricity Board and the China National Machinery Import & Export Corporation of China for the construction of a 300MW Coal fired Power Plant at Norochcholai, Puttalam. A loan of USD 455 Million was granted to the GOSL by the Government of China through EXIM Bank of China. Expected date of Commissioning of the Project is January 2012.

Acquisition of lands for the Power Station and Resettlement sites has been completed. Access road improvements, Construction of houses for the families to be resettled and the Survey for the 220kV Transmission line from Norochcholai to Veyangoda were in progress by 2007.

Electricity supply to the Power Plant site has also been completed by construction of a 1.75km 33kV line and a 160kVA transformer. Extension of the LV lines near Power Plant site and Resettlement site were done by constructing 3.2km 33kV line 160kVA transformer and 1.85km LV lines. Electricity schemes for the villages around Power Plant and Nirmalapura have also been completed.

### **(ii)Achievements in 2007**

RDA has completed the improvements on first one km on Palavi-Kalpitiya road. Surfacing of this section is to be done, while the improvements on 1-5 km stretch are in progress. RDA has commenced initial work for tendering for improvements to the balance section of the road.

Construction of resettlement housing complex was completed during 2007, and the houses were handed over to the recipients.

Consultancy services for the Project, obtained from Poyry Energy of Switzerland, commenced in June 2007. The Contract with the China National Machinery Import & Export Corporation came into effect in July 2007 and the contract commenced. Contractor has now submitted the basic design drawings and they are being reviewed by the CEB in consultation with the Poyry Energy.

The Project site and the housing complex site for operation staff were handed over to the Contractor and they have commenced detailed site investigations and construction of temporary facilities.

Submission of detailed designs by the Contractor and commencement of construction at the sites is expected to be done during 2008.

### **(b)TRINCOMALEE COAL POWER PROJECT**

A Memorandum of Agreement was signed between the Government of Sri Lanka, Ceylon Electricity Board and NTPC Limited (a fully Government owned enterprise in India) on 29<sup>th</sup> December 2006 for implementation of the Trincomalee 500 MW Coal fired Power Plant on the basis of a Joint Venture Company between the NTPC Ltd. and Ceylon Electricity Board.

Several options for location of the power plant were studied jointly with the Indian counterparts, and finalisation of the site is expected in October 2007. In the meanwhile, preparation of the agreements related to incorporation of the Joint Venture Company and Power Purchases are in progress. CEB has also initiated action for a study on Coal Supply Logistics for this project as well as other coal-fired power plants.

## **Furnace Oil Fired Power Plant**

### **(a)KERAWALAPITIYA COMBINED CYCLE POWER PROJECT**

#### **270 MW Furnace Oil Fired Combined Cycle Power plant at Kerawalapitiya by West Coast power (Private) Limited on BOOT Basis**

CEB has entered in to a Power Purchase Agreement with West Coast Power (Private) Limited in January 2007 to establish a 270 MW Furnace Oil Fired Combined Cycle Power Plant at Kerawalapitiya on Built-Own-Operate-Transfer basis. Site filling works has now been completed and the concrete piling works are on progress. 100 MW Gas Turbines are expected to arrive at the site from December 2007 onwards. Gas Turbine plants will be commissioned from June 2008 to make available 170 MW for commercial operation by September 2008. Total Combined Cycle Power Plant of 270 MW capacity will be operational from March 2010

## **LNG Developments**

### **(a)LNG fired 300 MW Combined Cycle Power Plant at Kerawalapitiya by Mitsubishi Corporation of Japan**

Government of Sri Lanka has decided to establish the second 300 MW Combined Cycle Power Plant also at Kerawalapitiya. Mitsubishi Corporation of Japan was nominated as the developer and offers were called from them in September 2006 for a 300 Mw Combined cycle plant initially to be operated using Auto Diesel and to convert it to LNG operation later. The Cabinet Appointed Negotiating Committee and a Project Committee have evaluated the proposals and negotiated with the Mitsubishi Corporation during the first half of 2007. Government of Sri Lanka has taken a policy decision in August 2007 to use only LNG or COAL for all future long-term thermal power generating plants. Hence the Mitsubishi Corporation was requested to furnish revised proposals for the power plant to use natural gas as the fuel from the inception. It is expected to finalize and sign the contract in November 2007.

### **(ii)Importation of Liquefied Natural Gas (LNG) for Power Generation in Sri Lanka**

Government has decided to nominate the Mitsubishi Corporation of Japan, the largest LNG handling establishment in the region, to develop LNG facilities in Sri Lanka as the Japanese Government has agreed that the JBIC will finance the project on concessionary terms. According to the decision taken on 12.09.2007, the Project Committee is now working on the preliminaries. LNG facility has three major components and all will be done by Mitsubishi Corporation of Japan with JBIC financial assistance. It is expected to enter in to a "Memorandum of Agreement" to cover the responsibilities of all parties in this exercise.

### **(iii)LNG Feasibility Study**

Feasibility study is expected to be commenced by Mitsubishi Corporation in October 2008 to complete within 6 months.

### **(iv)LNG Supply**

It is expected to supply LNG to operate all Kelenitissa and Kerawalapitiya Gas Turbines and Combined Cycle power plants. Mitsubishi was nominated on 12.09.2007 to furnish technical & commercial proposals for the consideration of the Government of Sri Lanka to secure uninterrupted supply of LNG in adequate quantities at an agreed price formula for 15 years.



The scope of work consists of Construction of 220 kV Gas Insulated indoor Substation at Kerawalapitiya and 220 kV outdoor Substation at Kotugoda. In addition, a 20 km/220 kV twin Zebra conductor transmission line from Kerawalapitiya power station to Kotugoda grid substation is to be constructed under this Project. The total Project cost of Rs. 3,100 million is funded by JBIC (JY 2,938 million) and CEB (Rs. 874 million). However, this loan was closed on 22nd May 2007 and funds to be re-arranged by the GOSL. At present, the whole of the Project cost is met by the CEB.

The Contract for the Lot A (Grid Substations) was signed in September 2007, and the contract for Lot B (Transmission lines) was signed in February 2007. The Project is to complete by March 2009.

This project is required to connect the proposed 300 MW Combined Cycle Power Plant at Kerawalapitiya to CEB transmission net work.

#### **c ) Vavuniya-Kilinochchi Transmission Project**

Scope of work in this Project consists of construction of 132/33 kV Grid Substation at Kilinochchi and construction 67 km of 132 kV transmission line from Vavuniya to Kilinochchi. De-mining work in Project area will be done by RRR Ministry. The total Project cost of Rs. 1,686 million is funded by JBIC (J¥ 1,157 million) and CEB (Rs. 585 million). This project will reinforce the transmission network of CEB with reconstruction of the damaged transmission system to Kilinochchi area and enhance the distribution capacity in Kilinochchi area by 31.5 MVA.

#### **d ) Pannipitiya Grid Substation Rehabilitation Project**

This Project will replace 14 existing 36 kV outdoor feeder bays by new 36 kV Gas Insulated switchgear and will erect two additional 36 kV bus section feeder bays at Pannipitiya Grid Substation. In addition, protection systems of present 132 kV transformer bays will be replaced.

This project will improve the reliability of electricity supply in and around of Pannipitiya and Maharagama areas. The total Project cost of Rs. 350 million is funded by CEB. The project was completed in August 2007.

#### **e) Indo Sri Lanka Grid Inter Connection Project (2011)**

Plan for a transmission interconnection between India and Sri Lanka has been under consideration for some time having been contemplated since 1970. As part of the technical assistance provided through United State Agency for International Development (USAID/South Asia Regional Initiative on Energy Project), the concept for transmission interconnection between India and Sri Lanka was reviewed and a pre feasibility study was conducted in 2002, followed by the recent study by Power Grid Corporation of India Ltd (PGCIL). Both these studies point to the feasibility of a short -term link of 500MW and a medium and long-term link of 1000MW between the two countries. This interconnection would allow bilateral power exchanges between India's Southern transmission region and the electric power system in Sri Lanka.

Based on investment cost and cost of power deliver to Sri Lanka, construction of high voltage direct current (HVDC) link from Madurai to Anuradhapura was considered as the preferred option. (Shown in the attached map). The tentative cost as per the initial studies of Power Grid Corporation of India would be as follows;

Long term link/medium term link (1000MW)	= \$ 430 million
Short term link (500MW)	= \$ 340 million

The construction period as per the findings of Power Grid Corporation would be 36 to 40 months.

The rationale for this interconnection is that it provides opportunities to enhance system reliability and power between two power systems of both India and Sri Lanka.

#### **f ) Kelaniya Grid Substation Augmentation Project**

This Project will erect a 31 MVA 132/33 kV transformer and six switchgear bays and one transformer bay at Kelaniya Grid Substation. The total Project cost of Rs. 235 million is funded by CEB. The tenders were invited in December 2006. The Tenders are being processed by a Cabinet-Appointed Procurement Committee. Completion of the work is expected in April 2009.

#### **g ) New Galle Transmission Development Project**

Under the Lot A of this Project three 31 MVA 132/33 kV transformer and nine 132 kV switchgear bays, fifteen 33 kV switchgear bays and 20 MVAR Capacitor

Banks will be installed at New Galle Grid Substation. Under the Lot B of this Project, 40 km of 132 kV double circuit Zebra Conductor transmission line from Ambalangoda grid substation to Galle Grid substation will be constructed. The project cost is funded by the Nordic Investment Bank and CEB. With due approvals, a proposal has been invited for these works. In the meanwhile, Environmental Clearance of transmission line has been obtained, and the preliminary surveys have been completed by CEB. Bid Proposal Evaluation has now been completed and tender negotiations have to be done.

The project is expected to complete in June 2009. This Project will improve the reliability of electricity supply in Galle area.

### **h) Beliatta Grid Substation Project**

Under this Project Construction of 63 MVA 132/33kV grid substation at Beliatta and 10 km. 132kV Transmission Line to Beliatta will be undertaken. The project cost of Rs. 771 million is funded by the Government. Works related to land and designs are in progress.

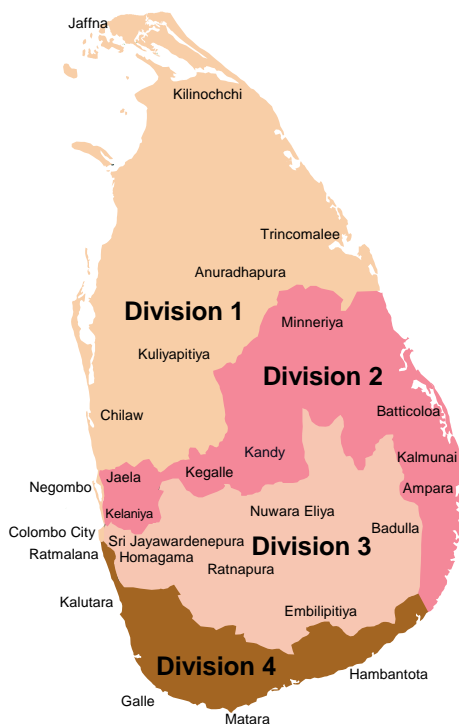
The project is expected to complete in October 2009. This Project will improve the reliability of electricity supply in Hambantota area.

## **DISTRIBUTION**

Ceylon Electricity Board is the main electricity utility that is responsible for the generation, transmission and 90% of the distribution of electricity in the country. The Lanka Electricity Company (Pvt) Ltd (LECO) that is a subsidiary of the CEB attends to

the balance 10% of the distribution in some of the urban coastal areas. A total of 4,198,200 customers enjoy the facility of electricity and the electrification level of the country is 77% of the total households in mid 2007.

The CEB distribution system comprises of 17,101 grid & distribution substations that are fed with 25,365 km of transmission & medium voltage distribution lines. The total low voltage network constitutes of 85,886 km of overhead & under ground lines that provide electricity to 3,763,500 customers by mid 2007 for domestic, industrial & commercial purposes.



At the commencement of year 2007 distribution losses in the electricity network were found to be about 13% and plans for expansion of electrification especially into rural areas of the country required strategies for bringing down losses to below 10% in line with international standards.

Strategies were formulated to augment & strengthen network in order to reduce losses while improving power quality & reliability through extensive studies. This exercise included the measurement of key performance indices and the identification of critical success factors that are vital for implementation in order to improve performance.

## **ACHIEVEMENTS IN 2007 AND THE PROGRAMME FOR 2008**

### **(a) Network Augmentation & Development**

Network studies have been conducted and the Medium Voltage Distribution Development Plan (2004- 2013) has been launched. The developments that are required in the Electricity Distribution Networks to cater to the future demand growth and to facilitate network expansion for rural electrification has been identified in this Medium Voltage Distribution Development Plan.

Many medium voltage express lines, development lines & distribution gantries with medium voltage line reconductoring work has been planned in the country together with primary substation development work. The objective is to strengthen network to cater to future load growth containing power losses & voltage drop within acceptable levels improving reliability of electricity supply.

Low voltage line conversion to three phase is to be carried out in all regions and new low voltage network development is planned under rural electrification and other projects in order to absorb the growing loads and improve access to electricity for the benefit of future customers.

The table indicates the medium voltage development work planned under the Project CAARP & the Medium Voltage Distribution Development Plan (2004-2013).

### **(b) MEDIUM VOLTAGE NETWORK DEVELOPMENT**

ITEM	QUANTITY				COST (Rs million)
	REGION 1	REGION 2	REGION 3	REGION 4	
Express & Medium Voltage Lines - km	237.5	62.5	81	187	3325
Distribution Gantries - Nos.	5	8	10	5	800

Medium Voltage Reconductoring - km	26.5	48.6	112	48	270
New Primary Substations & Augmentation - Nos.	8	2	3	5	3540
<b>TOTAL</b>					<b>7935</b>

**(b-1) Development work in the North & East**

The Conflict Affected Area Rehabilitation Project (CAARP) launched with the assistance of the ADB & NORAD particularly addresses the acute need for medium voltage distribution development & electrification work of the North & East of the country and many Distribution Development Lines and Rural Electrification Schemes are in progress with the work expected to be completed in year 2008. This project is expected to bring many community & industry related benefits by electrification of several villages consisting of families displaced by civil unrest and conflict.

A special team has visited the Northern Province on a mission to make preliminary studies of the network development work needed and arrangements are underway to formulate a workable programme of rehabilitation & expansion of network in the North.

Agence France de Developement (AFD) that finances sustainable development plans & humanitarian work has provided 2.13 million EUR to cover 37 km of extension & 11 km of rehabilitation work in the medium voltage distribution network of several Tsunami affected areas of the Eastern province where many still suffer due to devastated infrastructure and lack of basic amenities. The total cost of the project is 2.5 million EUR the contribution of the Government being 0.32 million EUR. The preliminary work of the project has been commenced and the construction is expected to be launched and accelerated shortly.

The medium voltage development work planned under funds from France (AFD) and the project CAARP funded by the ADB and NORAD would enhance distribution making it technically possible to provide electricity schemes to bring benefits to many families displaced by natural disaster & civil conflict.

The German Bank Kreditanstalt fur Wiederaufbau (KfW) that is a Reconstruction Credit Institute has provided funds for Tsunami relief work in the Eastern province out of which LKR 46 million would be utilized for electrification of the Thiraimadu Permanent Housing Scheme. About 12 distribution substations together with the low voltage distribution network to be constructed shortly would feed this scheme to house families displaced due to the natural disaster. The work is in progress and would be completed in November 2007.

### **(b-2) Reconstruction In Tsunami Affected Areas**

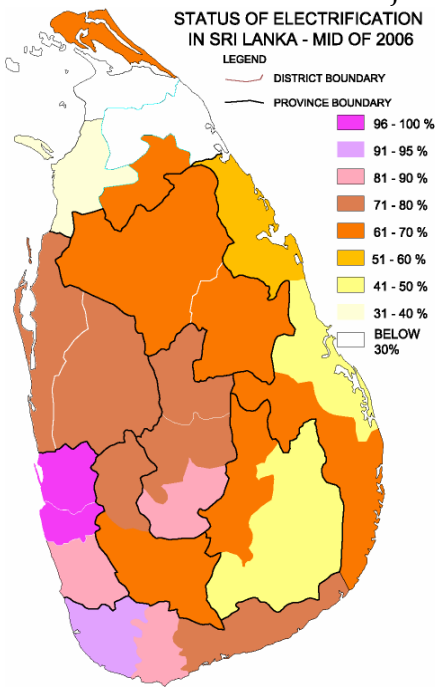
The Japan Bank for International Cooperation (JBIC) that has the objective to promote economical cooperation with overseas countries has provided LKR 2333 million for the immediate & long term re-construction work of areas affected by the Tsunami. The work related to immediate recovery included replacement of damaged network and provision of electricity to settlement camps and other community & commercial centres. The long term work involved the construction of medium & low voltage network and substations together with enhancement of transmission lines & grid substations aimed at providing electricity connections to at least 23,000 houses initially.

The electrification of houses built in Tsunami affected areas of the Eastern & Southern provinces are underway with funds provided by JBIC. The project also includes provision of equipment in these Tsunami affected areas together with the replacement of communications systems and other damaged assets of the Ceylon Electricity Board in the southern.

### **(b-3)-Rural Electrification**

Many rural electrification schemes have been completed up to year 2007 electrifying 79% of the total households in the island with funds received from lending agencies such as the Asian Development Bank, Kuwait Fund for Arab Economic Development, Swedish International Development Co-operation Agency and the Government of the People’s Republic of China. The Government of Sri Lanka attaches great importance to rural electrification with a vision to accelerate the work in order to achieve an electrification level of 85% by the year 2010.

The Rural Electrification Project RE6 presently ongoing at a cost of US Dollars 52 million with the assistance from the ADB envisages electrification of 700 schemes in all provinces of the country for socio economic development of the rural regions. About 150,000 consumers are expected to be directly benefited from the project that has a progress of 88% at present with the balance work expected to be completed by year 2008.



456 million with the assistance from the ADB envisages electrification of 700 schemes in all provinces of the country for socio economic development of the rural regions. About 150,000 consumers are expected to be directly benefited from the project that has a progress of 88% at present with the balance work expected to be completed by year 2008.

The Government of the People’s Republic of China provided a loan of US Dollars 24 million for electrification of 400 schemes in

several regions of the country to which electricity had not been extended in the past. The construction work of this project RE7 was carried out by a turn key contractor from China completing the work entrusted to them well within the scheduled time and the balance work is being carried out by the CEB with their own & contract construction force. About 75,000 rural households have benefited by this project which is now nearing completion.

The ADB provided US Dollars 7.6 million to carry out CAARP, an electrification project for the rehabilitation & expansion work of the Conflict Affected Areas of the North & East, that was expected to benefit 12,000 households affected by civil unrest and disturbances. The NORAD provided a further grant of US Dollars 8 million for extension work under this project to provide electricity to 9,000 additional households. The work has been commenced amidst many constraints and progressing well.

The Swedish International Development Co-operation Agency has provided assistance to carry out the rural electrification project RE4 at a cost of US Dollars 20 million with the view of improving socio economic conditions of the rural regions together with poverty alleviation, human development & gender development. The work is expected to be carried out by an international turnkey contractor commencing in year 2008 and the project would bring benefits in 225 electrification schemes serving 35,000 new consumers.

### **Future Rural Electrification Projects**

Further negotiations are being carried out with the USA , INDIA, CHINA & KUWAIT by the Ministry of Power & Energy and the CEB for the funding of the future projects RE8 , RE 9, RE 10, RE11 & RE 12 to be formulated in order to provide electricity supply to about 350,000 remote consumers to uplift rural economy & social development.

The Millennium Challenge Account of the USA is expected to fund the project RE8 to be launched at a cost of about US Dollars 25 million in order to provide direct & indirect benefits to about 30,000 households in the Northern & Eastern provinces & boundary villages.

The project RE9 expected to be funded by the KUWAIT fund has been configured with economic development in view to serve distant rural regions in need of industry for socio economic reasons.

The cost of this project is expected to be US Dollars 17 million with direct benefits to about 30,000 rural households.

The project RE10 has been planned to be constructed with funds from the People's Republic of China at a cost of US dollars 54 million the construction work being expected to be carried out by a turn key contractor from china.

Project is expected to bring many social & economic benefits to more than 100,000 rural households.

### **Embedded Generation in Uva & Sabaragamuwa regions and the Hill Country**

Out of the many embedded generation plants that were proposed in this Region-3 of the CEB in the past about 45 grid connected small hydro plants with an aggregate capacity of 91 MW have been commissioned. Further about 31 small hydro plants with a total capacity of 81 MW for which agreements have been signed remain to be implemented. However limited grid substation capacity in the region is a constraint on the implementation of several hydro schemes intended as well as on the processing of new proposals for plant. Thus investments are needed for augmentation of eight grid substations in this region in order to absorb the future embedded generation into the national grid.

#### **(a)Progress of Rural Electrification**

Many Rural Electrification schemes were planned in all provinces under ongoing projects RE6 & RE7, as Cost-Paid schemes and as sub projects under Gama-Neguma, Mahinda-Chintanaya, Rajarata-Navodaya, Negenahira Navodaya, De-Centralised-Budget & Provincial-Council-Budget programmes. Details of these schemes planned and their progress up September 2007 are indicated in the table.

#### **(b)Rural Electrification Schemes in Trincomalee District (486 Mn)**

Since the electrification rates in eastern province is low, to supply the electricity for people who live in Trincomalee District, Rs. 486 million has been requested in addition to the other projects which are located in same area.

### **2:2:3:4-RURAL ELECTRIFICATION SCHEMES COMPLETED UP TO SEPTEMBER 2007**

PROVINCE	SCHEMES PROPOSED	SCHEMES COMPLETED
Southern Province	1296	914
North Central Province	658	589
Central Province	1416	1143
Uva Province	319	138
West South Province	765	317
West North Province	319	170

Eastern Province	525	407
Sabaragamuwa Province	910	601
North Western Province	913	626
Northern Province	78	27
<b>TOTAL</b>	<b>7199</b>	<b>4932</b>

## **ELECTRICITY DISTRIBUTION IN THE FUTURE**

The future energy policy is aimed at serving the needs for service & economy related activities of the country with a study on the various alternative forms of energy available and its development. Also considered is the environmental impact of energy generation & use promoting electricity for economic & environmental reasons as a clean & safe form of energy for consumption. The economic well being of the country is placed uppermost in this exercise.

It is planned to formulate a proper commercial policy after a study using a commercial approach to market electricity considering which consumer classes are most important to cultivate to suite national policies such as production & export. It is hoped to spear drive electricity sales for the income earning activities of the country enhancing distribution techniques in a commercialized environment with private sector involvement.

### **(a)Colombo City Distribution Development Project**

The project at a cost of LKR 6070 million, the major portion of which is funded by a loan from the Japan Bank for International Cooperation (JBIC) and the balance by the CEB, envisages the reinforcement & rehabilitation of the transmission & distribution network of the Colombo City.

The transmission component includes extension of 132 kV feeder bays at Kolonnawa, installation of a new 132 kV Indoor Gas Insulated Switchgear Substation at Kelanitissa replacing the old 132 kV Outdoor Switchyard and laying of 8.7 km of 132 kv underground cables from Kelanitissa & Kolonnawa to 132/11 kV primary substation C that is to be upgraded.

The distribution component includes new 11 kV cable networks, replacement of existing 11 kv cable networks and low voltage cable network expansion with upgrading of the primary substation H. Also included is installation of compact distribution substations, feeder pillars & substation switchgear and replacement of ring main units.

The work is expected to enhance electricity supply capability from the Colombo City network to meet the fast growing domestic, commercial & industrial needs.

It is also envisaged to install a SCADA distribution control centre with remote terminal units at grid & primary Substations, distribution substations and compact distribution substations. This would allow limited distribution automation facility in the Colombo City network to operate it with greater efficiency & reliability.

During 2007, signing of contract and awarding for all the packages and Implementation of contracts for all the packages are expected to be carried out, after obtaining the requisite approvals. The Project is expected to complete by April 2009.

### **(b)Distribution Automation**

As electricity distribution expands in the country reliability & power quality becomes all the more important and this issue is expected to be addresses by a system for Distribution automation in the future. Arrangements have been already made to study, procure and install system isolating & protecting devices with facility for communication & automatic control. Already automation of some re-closers has been achieved in North Western & North Central provinces and fault indicators with remote communication facility have been installed in selected locations of North Western province.

Plans are under way to develop pre-designed strategies for handling power faults & restoration of supply with the least outage time and minimum losses to electricity sales. Distribution automation control equipment & software, compatible with the latest communications protocol, would be installed in the near future with the view of improving reliability of the network that are expanding to meet the needs of the ever demanding present day consumers of electricity. Such improvements are imminently needed to attract large scale investors with industrial projects that need reliable and quality power supply.

CEB hopes to introduce telemetering in the future mainly to cover heavy supply installations. Under this programme already remote metering of heavy supply installations in the Wennappuwa area has been successfully tested.

### **Lighting Sri Lanka Project (Southern Region)(Phese 1-Hambantota)**

Lighting Sri Lanka Hambantota Project is implemented as the 1st project under Lighting Sri Lanka programme to achieve 100% electricity accessibility to all including remote and underdeveloped areas for uplifting standards of living, human development and boost up the economic activities of villages and to provide reliable quality electricity supply meeting the demand due to rapid development of the Hambantota District including major development programmes such as Hambantota harbour, airport, other industries and tourism.

The electrification level of Hambantota was 66% at the end of year 2005 and another 34% of households has to be electrified. These households are situated in remote areas and at the corners of the villages so that the existing RE schemes could not be extended further as voltage drops experience at the end of the lines. The whole electricity network of Hambantota District will be investigated and adjustments and improvements will be carried out with appropriate technologies.

The project cost is estimated to be Rs 4,000 million and will be funded by the Government of Sri Lanka and the project is expected to be completed in three years. The project activities commenced in February 2007 and are expected to complete at the end of 2009.

A Grid Substation of 63 MVA capacity will be constructed at Beliatta and network expansions of double circuit express tower lines 108 km From Beliatta Grid to Walasmulla ,Hakmana, Tangalle and from Tangalle to Tissamaharamaya with two gantries will also be constructed. This will improve the reliability of Power Supply to the District. Further about 230 new RE Schemes and about 700 RE extensions with 350 km Medium voltage lines and 1250 LV lines will be constructed under this project.

New Area Engineer's office at Tangalle and three Consumer Service Centers at Tissamaharamaya, Suriyawewa and Tangalle will be established to provide better service to the electricity consumers.

A loan scheme for low income households who are unable to afford the total electricity connection cost will be arranged with the project funds. Further it is planned to provide CFL bulbs free of charge for 30,000 households who will be benefited in conserving of energy. The distribution of CFL bulbs among selected households and conservation of energy will be an example to other consumers for converting the use incandescent bulbs to CFL.

The investigation works of RE schemes have been completed in 5 Divisional Secretary Divisions out of 12 and database is being prepared with the collected data. Constructions of eight RE schemes, which will provide electricity to about 24 villages, have been commenced with the Rs.126 Mn. funds released from treasury from the revised budget of Rs.300 million. The balance of funds is expected before the end of 2007 and another selected RE schemes will be completed.

It is planned to procure materials required for the project and 40% construction works in the year of 2008 and estimated budget is Rs 2,220 million.

## **Lighting Sri Lanka Project (Sabaragamuwa Region)(Phase 1-Ratnapura)**

The Lighting Sri Lanka –Ratnapura District has been configured to serve the needs of the rural people acutely in need of social & economic development in this district bestowed with vast natural resources and future potential. The project costing LKR 5100 million envisages transmission & grid substation development and medium voltage distribution network augmentation & expansion that would serve 550 schemes for rural electrification bringing benefits to more than 50,000 households.

The medium voltage development planned is expected to enhance the electricity distribution capability of the region to meet the future development drive & industrial growth. Further it would strengthen the network to absorb future embedded generation in this district with perennial rivers & streams with a high potential for mini-hydro development

## **RENEWABLE ENERGY DEVELOPMENT**

In order to promote renewable energy as a future energy source, action has been taken to introduce a new tariff scheme for renewable energy sources. Accordingly, Cabinet approval was obtained for a cost based, technology specific three-tiered tariff for the following three technologies:

- Small Hydro
- Wind
- Bio Mass (Sustainably grown fuel wood)

Action has also been taken to obtain Cabinet approval for cost based, technology specific three-tiered tariff for the following input energy resources as well.

- Agro and industrial waste
- Municipal Waste
- Waste heat recovery

### **Small Hydro Power Development**

Development of small hydropower projects can be considered as the most promising commercially viable renewable energy source at present. Therefore, many projects have been commissioned and connected to the national grid under the Standardized PPA. A summary of details of the small hydropower projects by the end September 2007 is shown below:

	Number of Projects	Capacity MW
In operation	59	112
SPPA signed ( <i>some are under construction</i> )	35	86

Letters of Intent issued	69	118
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### **Wind Power Development**

CEB has received several project proposals from the private sector under Standardized PPA to develop wind power projects in Kalpitiya area. That region was considered for initial development due to higher wind potential throughout the year. Further 50 MW wind power plant has been considered under a separate power purchase agreement for development. A summary of details of the small wind power projects by the end September 2007 is shown below:

	Number of Projects	Capacity MW
Letter of Intent issued	4	33.8
Under Consideration	1	50.0

### **Dendro Power (Bio mass : Sustainably grown fuel wood)**

Bio mass based electricity generation can supply firm energy to the national power system like the conventional thermal power plants. Furthermore, it offers multi dimensional non-energy benefits to rural socio economic development and deserves an incentive price, to attract potential private sector developers to invest in the industry. Accordingly, the Government has granted cost based, technology specific three-tiered tariff for the bio mass power generation. A summary of details of the Dendro power projects by the end September 2007 is shown below:

	Number of Projects	Capacity MW
In operation	2	2.0
Letter of Intent issued	7	18.55

### **Power from Municipal Solid Waste**

Management and disposal of municipal solid waste has become a problem to the Local Authorities. It is now considered that the generation of power using solid waste in Local Authority areas could be a satisfactory solution for this problem. Considering this as a useful energy source, action has been taken to issue letter of intents to generate power from municipal solid waste.

	Number of Projects	Capacity MW
Letter of Intent issued	11	89.6

## **Power Sector Reforms Project**

### **(a) Status at the Beginning of 2007**

The Electricity Reform Act No.28 of 2002 was enacted in December 2002 to regulate and restructure the electricity industry in Sri Lanka. The Public Utilities Commission Act, No 35 of 2002 was also enacted in December 2002 and the Public Utilities Commission of Sri Lanka (PUCSL) has been established in July 2003.

Certain provisions of the Electricity Reforms Act No. 28 of 2002 were implemented when the Government decided to review the on-going power sector reform process in 2005. The review process endorsed the establishment of PUCSL to regulate the power sector whilst proposing a modification to the industry structure, outlined in the Electricity Reform Act No. 28 of 2002. Accordingly, Sri Lanka Electricity bill and the Ceylon Electricity Board (CEB) (Amendment) bill were drafted. However, certain concerns were articulated on these two bills by the Supreme Court and as a result the Government decided to evolve a new power sector reforms process within the existing industry framework.

A three member committee was appointed in October 2006 by the Secretary to the Ministry of Power and Energy on the advise of the Hon. Minister of Power and Energy to evolve a Power Sector Reform process within the existing framework.

The Committee report was submitted in November 2006 which recommended introducing **regulatory reforms** as an initial step, by empowering Public Utilities Commission of Sri Lanka (PUCSL) established under Public Utilities Commission Act No. 35 of 2002, to regulate the power sector. The Committee also recommended to introduce an appropriate internal structure within the CEB to facilitate regulation and to drive performance improvements.

The approval of the Cabinet was granted in November 2006 to proceed with the regulatory reforms and Legal Draftsmen to prepare necessary amendments to '**Sri Lanka Electricity Bill**' in this respect.

### **(b) Achievements in 2007**

The necessary amendments to the Sri Lanka Electricity Bill have been finalized by the Legal Draftsmen. The draft bill has been submitted to Attorney General Department for clearance.

Following the legal clearance from the Attorney General, the Sri Lanka Electricity Bill will be submitted for the Cabinet approval and is expected to place before the Parliament for enactment during 2007.

In parallel with the legislation process action would be taken to create an environment to facilitate effective regulation in the Ceylon Electricity Board and other power sector institutions. This process will be carried out during 2007 and first quarter of 2008.

### **(c)Expected Activities to be carried out in 2008**

On enactment of Sri Lanka Electricity Bill, a licensing **regime** would be established. The Ceylon Electricity Board will be initially issued with interim licenses for a period of 6 months by the PUCSL. During this period a licensing process would be carried out for issuance of permanent licenses to carry out its core business functions under regulatory purview in the power sector in order to safeguard consumer interests, establish transparency, attract investments and to ensure appropriate balance between consumers, policy makers and the operators.

In parallel with the regulatory reforms, activities relating to creating an environment within the Ceylon Electricity Board (CEB) to facilitate regulation and to drive performance improvements would be completed prior to issuance of permanent licenses.

### **(d)Future Development**

Following are the key changes envisaged in the power sector on enactment and implementation of the **Sri Lanka Electricity Bill**;

- Establishment of legislative framework to empower PUCSL to regulate the Power Sector, including CEB.
- A licensing regime would be established where CEB and other operators are required to obtain a licenses from PUCSL to generate, transmit, distribute and supply electricity.
- PUCSL will determine tariffs, following tariff filing and a public hearing process.
- The CEB will remain as a public corporation and will be issued with multiple licenses for generation, transmission, distribution and supply of electricity. However licensing condition would necessitate respective licensed functions of the CEB to be 'ring fenced'. This would allow separation of accounts and facilitate effective performance monitoring.
- Functional Business Units (FBUs) would be established within the CEB to handle respective licensed functions. Internal power trading system would be established to facilitate power trading among the FBUs .
- Regulator (PUCSL) will be responsible to safeguard interests of the consumers, investors, policy markers and all operators of the power industry.