# CHAPTER VI

# COMMERCIAL & REGULATORY ASPESTS

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# CHAPTER VI

# COMMERCIAL & REGULATORY ASPECTS

## VI .1.Formation of State Electricity Regulatory Commission.

The State Electricity Board was working under the Energy Deptt. of State Govt. The tariff was determined by the Govt. The Minister of Govt. was deciding on the consideration of the local environment, political stability and vote Bank etc. Therefore, there was no regular revision of tariff of power by the State Electricity Boards.

The State Govt. also announcing various schemes to offer concessional rate or free power to the farmers, Nagar Palikas, Water Works etc. The difference between cost to serve and concessional tariff/free supply is the amount of subsidy. But the Govt. is not providing subsidy at regular intervals as and when due. However, it was released at the time of availability of budget of the State Govt. Therefore, all the State Electricity Boards suffer huge working capital gap and increase the burden of interest on working capital.

The Govt. of India had considered the reform of power sector and reviewed one of the factors of financial crises of State Electricity Boards. Therefore, Govt. of India has amended the Electricity (Supply) Act, 1948 in 1991 as "The Electricity Law (Amendment) Act, 1991" for formation of State Electricity Regulatory Commission. The State Electricity Regulatory Commission has to set up the tariff rules and approve the tariff of the utilities and stake holders. The State Electricity Regulatory Commission is independent body by Special Act, so there is no control of the State Govt. .

**Independent Regulation** :

For regular revision of tariff, Govt. has established the State Electricity Regulatory Commission (SERC) as well as Central Electricity Regulatory Commission (CERC) to frame the terms and conditions of tariff. Approval of Power Purchase Agreement, Multi Year Tariff and other misc. activities related to power sector.

## VI .2. Laws Relating to Electricity in India.

The electricity is in concurrent list of the constitution of India. Therefore, Central Govt. as well as State Govt. both are responsible for the development and administration of electricity sector. The Indian Electricity Act 1910 is Act before Independent/Republican of India mainly to provide for supply and use of electrical energy and right and obligation of licensees. The Central Govt. has amended the various laws after Republican as under :

1 .Electricity (Supply) Act 1948 After independent of India, This was the first Acts related to electricity in India have been enacted. Electricity Supply Act, 1948 related to statutory power and functions of the Central Electricity Authority, State Electricity Boards and Generating Companies provide for the rationalisation of production and supply of power.

2 The Electricity Amendment Act 1959 enlarge the scope of facility available to consumers of electricity, provision of private licensees, consumers of private licensees etc.

3 Electricity Regulatory Commission Act 1998 related to establishment of Central as well as State Regulatory Commission for rationalisation of electricity tariff, transparent policies and related aspects.

4 The Electricity Laws (Amendment) Act 1991 provides for scope of private sector participation in power generation, supply and distribution.

5 The Electricity Act 2003 to improve the financial health of State Electricity Boards and to provide power as per the demand. Private sector to be encouraged for the installation of Power Plants, supply and distribution by creating the competition in the State/ country.

6 Therefore, reform of power sector is introduced in 1991 and some major amendments also made in Electricity Supply Act, 1948. To over come the difficulties, the Govt, has decided to replenish this Act and introduced the new Act known as The Electricity Act, 2003 .

The main features of the Act are as under :-

a) To given different licensee for generation and captive generation.
b) For transmission, distribution and trading of power, licensee is required.
c) To unbundle the State Electricity Board.
d) To set up State Regulatory Commission and Appellate Tribunal.
e) Metering of electrical supply is mandatory.
f) To more strength the provision related to theft of electricity.
g) Central Govt. to prepare National Electricity policy and Tariff policy as well as National Electricity Plans.

**VI .3. Determination of tariff of power Generating Companies by Regulator.**

State Electricity Regulatory Commission (SERC) is determine the tariff as per the guidelines issued by CERC and other policy of Government . Commission is authorized as per Section 61 of The Electricity Act 2003. ( this authority is regulatory authority (SERC / CERE )). SERC is determine tariff in two parts viz.

(A) Energy charge and

(B) Capacity Charge.

(A ) Energy Charge is also known as variable cost .

Energy Charge / variable cost is determine on the bases of technical parameters.

- Plant Load Factor ,
- Station Heat Rate,
- GCVof Fuel, rate of Fuel,
- Actual quantity consumed and
- Admissible fuel Quantity as per approved parameters of SERC.
- Auxiliary Consumption

(B) Capacity Charge is known as Fixed Cost.

Capacity Charge / as Fixed Cost base on annual fixed charge recoverable on the base of Plant Availability Factor of Power Plant. Viz

(i) Operation & Maintenance Cost

(ii) Depreciation

(iii) Interest on working capital

(iv) Interest on project capital long term loan

(v) Return on equity.

(vi) Income Tax.

(Sources :*Terms & conditions of Tariff Detrmination of Power.* Delhi: Central Electricity Regulatory Commission of India. Retrieved Regulary every Month 2014, from www. cercind.gov.in ) (India C. E., 2014)

## VI.4 MULTI YEAR TARIFF (MYT)

For the welfare of public at a large, the Govt. is to provide "power to all " policy. It is equally important to adequate control on Tariff of Power by the Regulatory Authorities to check the Quality Power at Affordable Tariff . CERC/SERC has primary duty to exercise proper checks & control for Fair & reasonable Tariff of Power. Therefore, CERC/SERC have introduced MYT Regulations. One of the key objectives of regulation is to recompense good utility presentation while concurrently correcting the utilities for their letdown to complete as per views. Lessening of perils of utilities is also vital objective of regulation. Multi Year Tariff (MYT) regulation is one of the key means for attaining these aims. From the outlook of consumers as well as from that of utilities, MYT regulation provides confidence on costs that the utilities can rightfully be held responsible for MYT regulation also seeks to reduce the cost of guideline and monitoring involvement in monotonous utility matters. The motive of MYT is to examine the tariff for generation, transmission and distribution of power and address the key issues that are involved in MYT frame work.

**Key aspects of MYT :**

a) Measurability of the elements around the incentivisation.
b) Materiality – Risk mitigation mechanism to significantly affect the utility.
c) Controllable elements will be controllable to the utility to enable them to meet regular target. It will be predictable and ability to determine various level of regulatory targets.
d) The controllable factors and uncontrollable factors for control period is the main issue relating to generation

( Sources: *MULTI YEAR TARIFFMYT order of GERC.* Gsndhinagar: Gujarat Electricity Regulatory Commission (GERC),. Retrieved Regularly 2017, from www.gercin.org )

(India C. E., 2014) (GERC, 2017)
(GERC, 2017)(India C. E., 2014)(GSECL, 2012)
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## VI.5 POWER PURCHASE AGREEMENT

Power purchase Agreement (PPA) is contract between purchaser of Power and Seller of the Power for a specified period of 15/20/25 years as per the specified terms and conditions for the Power Purchase agreement. PPA provides various technical and commercial terms and conditions regarding the Technical information of Power Plant . (A) PPA provided further Technical details viz.

Capacity of plants, SHR ; PAF, PLF , Auxiliary Consumption, Specific oil consumption, types of fuel with Fuel Supplies Agreement with supplier, Sub station where power will be supplied, Grid connection, Time of completion of Power Plant . Date of Synchronization of Plant , and Date of Commercial Operation etc

(B) Commercial Details viz

(i) Payment and performance security;
(ii) Transmission of power and inter connection to the grid;
(iii) Arrangements with lenders;
(iv) Consents, permits, approvals and licenses;
(v) Rights to the land on which the power plant and / or transmission lines
(vi) Insurance, mission lines will be located.
(vii) Events of act of God and Natural calamites
(viii) Effective date of PPA
(ix) Time for satisfying conditions precedent and attaining financial close time for testing the plant units for ascertaining COD.
(x) Date of completing inter connection facilitie4s and related facilities Time for fuel supply connection to the plant.
(xi) Fuel supply start date.
(xii) Time for conducting capacity tests.
(xiii) Cure periods for various breaches.
(xiv) Time to serve termination notices.
(xv) Dispute resolution timelines.

( Sources : *Guidelines of Power purchase Agreement.* Delhi: MoP.GoI Retrieved from www. powermin.nic.in (Power, 2015)

## VI.6 POWER TRADING

Electricity is new commodity considered in trading activities by Power Exchange of India. The concept of power trading though well established now has been ever evolving and taking forms and shapes from time to time. Trading of power was earlier started with conventional bilateral trading and banking arrangements but it has now evolved with new methods and practices. In the Indian scenario, 90% of base load power requirement is satisfied through Long term Power Purchase Agreements while balancing short term requirement is mitigated through exchange of power between surplus entities and deficit entities via bilateral arrangements, banking, Traders, UI/DSM occurrence and even through Power Exchanges.

Power Exchanges have commenced operations since 2008 with a broad view to develop a market where power sector participants can efficiently buy and sell power that is not tied up in long term PPAs and for catering short term balancing needs which arise from time to time in the power sector. Power Exchanges are simply financial entities, allowing buyers and sellers to trade transparently at a common price. Power Exchanges have been playing twin role of helping in price discovery of electricity in the spot market mainly, Day Ahead market and price dissemination electronically in the country. Power Exchanges have created a comprehensive market structure and enabling the transaction, execution and contracting all types of possible products in the electricity markets. Power Exchanges are discovering the market prices which are market driven and determined through push and pull of demand and supply rather than conventional mechanism of arriving at the prices on cost plus basis. The creation of a common platform for trading has helped in streamlining the trading process, standardization of electricity as a tradable product, provide a payment security mechanism through a Clearing House and increase business confidence in the power sector.

Power Exchanges have ushered into short term power market with new dynamism offering regaling features like anonymous bidding, electronic platform, and transparency, minimum bid size of 1 MW etc, standardized power trading contracts, with fair, efficient and robust price discovery mechanism through electronic algorithms.

Trading in electricity has been a licensed activity since the year 2003. Central Electricity Regulatory Commission (CERC) constituted by the Electricity Act 2003 ensures that “electricity” is given the widest scope and is interpreted to extend to all ancillary or subsidiary matters which can fairly and reasonably be comprehended in it. Regulatory

Commissions as expert bodies have been created under the Act and empowered to govern all matters related to Power Sector.

Electricity Traders have played critical role in transferring electricity from surplus regions to deficit regions in the country through “Intra-State trading” i.e. purchase of electricity for re-sale within the territory of the same State and “Inter-State trading” i.e. purchase of electricity from one State for re-sale in another State, including electricity imported from any other country for re-sale within India or exported to any other country subject to compliance with applicable laws and clearance by appropriate authorities

Gujarat State Utility, Gujarat UrjaVikas Nigam Ltd. (GUVNL) (erstwhile GEB) started power trading long back before enactment of Electricity Act 2003 when trading was a new concept. GUVNL has traded power utilizing the different formats from time to time like exchange of power in Unscheduled Interchange mechanism (UI) and banking arrangements, sale / purchase of power through traders and bilateral arrangements with other states and even through Power Exchanges.

The SEBs / DISCOMs who have the obligation to provide electricity to their consumers mainly rely on supplies from these long-term contracts. However, it is neither feasible nor economical to meet short term, seasonal or peaking demand through long-term contracts which makes Power Trading essential to cater the short term demand at an optimum cost. Similarly, power trading is essential for DISCOMs for selling short-term surpluses in order to optimize the cost of procurement. The CPPS participate in trading in order to optimize their operating cost and in the process, supply electricity to the grid.

(sources :*www.ptcindia.com*. Retrieved from www.ptcindia.com: www.ptcindia.com refer in the month of June 11, 2017 ). (PTC, 2017)

## VI.7 CARBON TRADING.

### VI.7.1 Emission Reductions; A New Commodity.

The vital feature of the Kyoto Protocol is its requirement that countries limit of reduce greenhouse gas emissions. Emitting GHG over a set limit entails a potential cost. On the contrary, emitters able to settle below their limit hold something of value. Thus, a new commodity was created – emission reductions. Because carbon dioxide is the principal GHG, people speak simply of trading carbon.

The concept of carbon credits came into existence as a result of increasing awareness of the need for controlling emissions. Over a decade ago, The need for a reduction in carbon emissions was debated at the United Nations Conference on Environment & Development (The Earth Summit) in Rio de Janeiro in 1992, resulting the adoption of an international treaty called 'the **U**nited **N**ations **F**ramework **C**onvention on **C**limate **C**hange' (UNFCCC) -- to begin to consider what can be done to reduce global warming and to cope with whatever temperature increases are inevitable. The Convention joined by most of the countries in the world, entered into force on 21 March 1994."

**Emissions Trading**

Countries with commitments under the Kyoto Protocol can acquire emission units from other countries with commitments under the Protocol and use them towards meeting a part of their targets. The Kyoto Protocol prompted the creation of the European Union Emissions Trading Scheme and many people foresees the growth and linking of emissions markets globally.

(Sources: Handbook on the Carbon Credits Mechanism- by Rajkumar S. Adukia and Carbon Credit and Kyoto Protocol-by J K Dadoo, Secretary (Environment)-cum- Chairman (DPCC) Ministry of NCT New Delhi.

## VI..8 CDM Project of Gujarat State Electricity Corporation Limited (GSECL)

**Case study of CDM Project of Gujarat State Electricity Corporation Limited (GSECL)**

***" Sale of Certified Emission Reductions (CERs)for the Grid Connected Combined Cycle Power Plant of capacity 219.067 MW using Natural gas / R-LNG as fuels at Gujarat, India registered as CDM Project no. 1352 with UNFCCC."***

CDM Project of Gujarat State Electricity Corporation Limited (GSECL) , UNFCCC registration No. 1352 titled "Grid-connected Combined Cycled Power Plant of capacity 219.067 MW using Natural Gas / R-LNG as fuels at Gujarat, India" has been registered on 4 February 2008. CERs would start accruing to the Project after the date of registration and will get issued upon each verification / certification done by a Designated Operating Entity ("DOE").

**CER issuance :** GSECL has undertaken the Initial and first monitoring and verification exercise for the period from 10 February upto 30 April 2008. This is to ensure that any issues relating to monitoring are addressed up front in the first verification exercise and the monitoring risks are significantly reduced for future CER generation.
The monitoring report (MR) was submitted for verification by TUV-Nord in July 2008 and the site visit for verification was completed on 8 August 2008. The quantity of CERs (TUV-Nord yet to give their final verification report) from this period is 21965.

**CER transaction :**PwC started the process of buyer identification for the CERs expected to be issued from the first monitoring period. The process was started in last week of July when the MR was uploaded by TUV -Nord on UNFCCC website.
The "Instructions to Prospective Buyers " were prepared in due consultation with GSECL and was shared over email with over 70 buyers. The buyers include various financial institutions, bank, brokers, fund houses among others.

A "spot " or "issued" CER carries very little risk to the buyer and therefore, the buyer is ready to pay prices close to secondary CER prices. There is generally a margin of Euro 0.2 to Euro 0.5 per CER and discounting from the date of CER delivery under the contract to the date of settlement of secondary CER contracts (December of each year) at the prevailing interest rates.

Given carbon market volatility and the quantum of CERs, the bids were received from 6 buyers. These bids are reflective of the above assessment.

All the buyers have offered floating and / or fixed price bids. The December 2008 CER settlement price on the European Climate Exchange (EDCX) to which the floating bids have been linked was valued at Euro 19.20 for 2nd October 2008.

GSECL has decided the buyer.Based on the discussion with the consultants and trends in the CERs markets, the two highest fixed prices are:

1. Adani Enterprises Limited has quoted 19.25 Euros, valid till close of business on 3-10-2008.
2. Citigroup Global Markets Limited has quoted a rate of 19 Euros, valid till close of business on 3-10-2008.

**The two highest floating rates are:**

1. Citigroup Global Markets Limited has quoted 98% of ECX Dec08 contract on 3-10-2008.
2. Mercuria has quoted 97.5% of the CER Dec-08 ECX settlement price to be converted into a fixed price upon delivery.

**Path Forward**

Once PwC receives a "go ahead" from GSECL, they would request for the draft of Emission Reduction Purchase Agreement (ERPA) from the selected bidder. GSECL can then get the ERPA reviewed from their legal experts. On receiving GSECL's observations/ comments the ERPA between them and the prospective buyer would be finalised. This process may take close to 6-8 weeks.

On finalization of ERPA and after issuance of CERs, GSECL would need to communicate with UNFCCC for transfer of issued CERs to the buyer's account on UNFCCC. This would entail sending a forwarding request ( hard copy and scanned email) to UNFCCC incorporating the details in the Forwarding Request form.

Once UNFCCC receives the forwarding request, it effects the forwarding of CERs within a few days. It will email to the buyer giving all the details of the CERs received. This email would be proof of delivery.

At the time of sending the forwarding instruction, GSECL to also prepare an invoice and send the hard copy of the invoice to the buyer. The buyer has release the payment after the invoice has been received and proof of delivery obtained. This would complete the transaction cycle.

(Sources :GSECL, (2008). *CDM.* Vadodara: Generation Department of GSECL. Retrieved from www.gsecl.in ) (GSECL G. D., 2008)(GSECL G. S., 2012)

## VI.9 Risk Management of power sector.

### VI.9.1 Introduction :

Electricity is a boon to mankind. Electricity is required both by the industrial and domestic sector. India has witnessed a phenomenal growth in the power sector int he last 30 years. The requirement of power is increasing day by day. With the increase in demand, there is a need for installing additional power plants and increasing the capacity of existing ones. Power Plants consume large quantities of combustible materials like coal, oil, gas and also considerable amount of lubricating oil for operations and hence are prone to fires. This article highlights the fact that though power plants are prone to fire hazards, fires can be prevented by proper design, safe operations and regular maintenance. Safety aspects and loss control issues should be inbuilt in to the management system. The safety aspects have to be reviewed periodically and personnel should be trained in safety measures.

Several Fires have occurred in the past in power plants during the past in spite of that adequate care was taken while designing and installing the power plants units.

### VI.9.2 Areas of Potential Fire Hazards

"The areas of thermal power plant which are vulnerable from fire point of view and where extra attention of the fire safety is required are discussed below :

The main fire risk areas in a thermal power station are ;

- ✓ Coal storage & handling/coal conveyor/Coal mills
- ✓ Boiler area /Lubricating oil system /Generator area
- ✓ Hydrogen generation plant /Hydrogen storage and handling
- ✓ Control room /Cable gallery /Transformers/Switchgear room

Fires in thermal power plants are not uncommon. Review of past losses suggests that of proper design, operations, maintenance and safety and loss control issues should be in-built in to the management system. The safe operation of a power plant can be achieved through an ongoing review process with emphasis on efficient procedures, well trained and regularly exercised plant personnel and an effective safety system.

Risk Management of power sector is required to be managed very critically. Therefore the safe operation of power plant can be achieved through an on-going review process with emphasis on following procedure and well trained and regularly exercised plant personal with

effective safety system. Therefore, Company especially Gujarat State Electricity Corporation Ltd., is taking following insurance coverage to mitigate the loss if arise in future.

The Company is taking following insurance policy.

1. Industrial All Risk (IAR) policy is a policy with specified sum insured equivalent to project capital cost of the Company. This policy compromises all the risk and the risk for machinery breakdown, material damage, loss of profit etc. Over above, plants are also insured with add on cover of earthquake and terrorism. Insurance generally, IAR policy is considered for the plants commissioned after 1997 onwards.
2. Boiler explosion policy also is considered for those power plants having no IAR policy. Generally those plant's boiler data which is before 1997 are considered.
3. Standard Fire and special Peril Policy is a policy for fire of any plant with additional coverage of riots, earthquake as well as terrorism.
4. Marine Policy has been taken for the transfer of materials from power station to other places and vis-a-vis for the transit period.
5. Storage oil tank has been taken for the oil stored in various tanks of our power stations. For this fire and other standard peril are covered.
6. Cash in Transit and cash in safe policy for cash handling.
7. Directors and Officers Liability ( D&O Policy) for safeguarding Directors & Officers.

Over and above power plants also facing problems of cyber attack. Generally it is internally managed and it is self insured.

(Sources: GSECL F & A department insurance section , 2016-17-18).