TAMIL NADU ELECTRICITY REGULATORY COMMISSION

(Constituted under section 82 (1) of the Electricity Act, 2003)
(Central Act 36 of 2003)

PRESENT:-

ThiruS.Akshayakumar …. Chairman

ThiruG.Rajagopal …. Member

and

Dr.T.PrabhakaraRao …. Member

M.P.No. 82of 2013

SESA STERLITE LIMITED
Formerly
Sterlite Industries (I) Ltd.
SIPCOT Industrial Complex
Madurai Bypass Road, TV Puram P.O.
Tuticorin – 628 002, Tamil Nadu, India.

…Petitioner
(ThiruRahul Balaji
Advocate for the Petitioner)

Vs

Nil …. Respondent

Dates of hearing :27-01-2014, 17-04-2014, 21-04-2014
30-12-2015, 11-02-2016 and 25-10-2017

Date of order : 10-12-2018

The above M.P.No.82 of 2013 was heard and reserved on 21-04-2014 by the earlier Commission consisting of two Members and as one of the Members demitted office before pronouncement of the order, the case was posted for further argument before this Commission and accordingly arguments of both the parties were heard elaborately on 25-10-2017. The Commission upon perusing the above petition and other connected records and after hearing the arguments ofthe petitioner passes the following order:-

ORDER

1. Prayer of the Petitioner in M.P.No.82 of 2013:

The prayer of the Petitioner is to declare that the Petitioner's Waste Heat Recovery Boiler system which consists of one Waste Heat Boiler and Steam Turbine Generator for generating a power of 5 MWH at Tuticorin, Tamil Nadu being a Cogeneration Plant under the provisions of the Electricity Act, 2003, it is not required to procure power from Non-Conventional Energy Sources in terms of the judgment of the Hon'ble APTEL in Appeal No.57 of 2009, Century Rayon Vs. MERC and the Petitioner would be entitled to account for consumption of power generated from this plant towards Renewable Purchase Obligation under the TNERC (Renewable Energy Purchase Obligations) Regulations, 2010.

2. Facts of the case:-

2.1. The Petitioner is SesaSterlite Limited, the successor-in-interest of Sterlite Industries (India) Limited (SIIL) under and in terms of the Scheme of Amalgamation and Arrangement, inter-alia, between Sesa Goa Limited and M/s.SIILas sanctioned by the Hon'ble Bombay High Court, Goa Bench and Hon'ble Madras High Court vide orders dated 03-04-2013 and 25-07-2013 respectively, whereby SIIL has merged with Sesa Goa Limited with effect from 17-08-2013.

2.2. The Petitioner's principal business is that of copper smelting and includes a smelter, refinery, phosphoric acid plant, sulphuric acid plant and copper rod plant at Tuticorin.

2.3. The Petitioner is having a Waste Heat Recovery Boiler system with one Waste Heat Boiler and Steam Turbine Generator for generating power of 5 MWH and the Petitioner said that the power generator is a cogeneration plant.

3. Contentions of the Petitioner:-

3.1 Section 2 (12) of the Electricity Act, 2003 defines “co-generation” as a process which simultaneously produces two or more forms of useful energy (including electricity). The Commission by its order dated 12-01-2009 in M.P. No.7 of 2008 has held that the plant is a NCES based co-generation plant.

3.2. The Petitioner’s plant is Waste Heat Recovery Boiler system and consists of one Waste Heat Boiler and Steam Turbine Generator for generating a power of 5 MWH. The boiler operates under forced circulation. This boiler is installed in smelter and it is located downstream of the ISA furnace. Cooling of off-gases from Smelter, thereby generating steam for power, which is an integral part of the metallurgical process, not a stand-alone / independent operation.

3.3. The Petitioner’s boiler system consists of Cooled Roof, a vertical radiation off-take I & II followed by a horizontal duct casing where the convection heating surfaces are located. The boiler casings are made from membrane walls of the tube-flat tube-type. The convection heating surface consists of five vertical tube bundles suspended into the horizontal duct casing (Evaporator) from above. These surfaces will be cleaned by a pneumatically driven rapping system. The rapping tube level of these bundles is arranged outside of the gas stream. The arrangement allows a free fall even for large dust particles into the dust hoppers. The operation of this cleaning system is performed automatically. The off-take walls, the additional

screens, the membrane walls of the horizontal duct casing and the convection heating surfaces are evaporator elements connected to a combined forced circulation system. The WHRB cools the off-gas from 1044°C to 350ºC, and recovers the heat as saturated steam at the rate of 45 tonnes / hr. saturated steam received from WHRB is at a temperature of 285^{o} C and pressure of 65 bar is used to generate a power of 5 MWH by a Steam Turbine Generator (STG).

3.4. During the smelting process in the ISA furnace enormous heat is sent out through the off gas. To utilize this heat, a waste heat,recovery boiler is provided. From this boiler, we get about 45 tons of saturated steam at 285^{o}C and 64 bar pressure. The speed of the turbine and the power output is controlled by the Woodward governor.

3.5. The generator is rated to produce 5 MW for steam parameters of 64 kg/cm sq., 45 T, 280ºC Deg at synchronized condition. The generator will be operated in synchronous mode with brushless excitation. The reactive power (MVAR) can be varied by excitation and active power (MW) can be varied by Governing system through the Woodward governor. Due to load angle difference between running system (Grid) and incoming system (TG), the power will be transferred to grid. In a generator, the excitation system provides the magnetic field through the rotor and an emf is induced in the stator. This in turn is fed to the main grid through power cables.

3.6. The Electricity Act, 2003 also casts a duty on the State to promote generation of electricity from cogeneration and renewable sources. In this light, section 86 (1) (e) of the Act casts a specific obligation on the State Electricity Regulatory

Commission set up under the Act to promote generation of electricity from cogeneration and renewable sources of energy. To ensure the usage of electricity generated from cogeneration and renewable energy sources and to increase the share of cogeneration and renewable energy, the SERCs are also required to set out regulations that make it necessary for Distribution Companies to purchase certain percentage of their total power requirement from such sources. This target is termed as Renewable Purchase Obligation (RPO).

3.7. The Tamil Nadu Electricity Regulatory Commission (Renewable Energy Purchase Obligation) Regulations, 2010 govern the framework under which specified obligated entities purchase renewable energy as per quantum specified by the Commission. These regulations also provide the framework under which units that produce electricity using renewable sources of energy can receive accreditation.

3.8. The “Obligated Entity” meanthe distribution licensees, consumers owning grid connected Captive Generating Plants (CGPs) and open access consumers in the State of Tamil Nadu, who have to mandatorily comply with Renewable Purchase Obligation under these Regulations subject to fulfillment of conditions outlined under Regulation 3.

“Renewable Sources” mean sources of energy as defined in the Regulation 2 (1) (g) of the Power Procurement from New and Renewable Sources of Energy Regulations, 2008 issued by the Commission.

3.9. Under the Regulations, every obligated entity shall purchase not less than defined minimum percentage of its consumption of energy from Renewable Energy

Sources under the Renewable Purchase Obligation (RPO) during a year as specified by the Commission.

3.10. The renewable power purchased from the following sources and means mentioned against each obligated entity shall be accounted for RPO purpose:-

(a) Distribution Licensees-

(i) Power purchased from Renewable Energy sources under preferential tariff as fixed by the Commission and consumed in their area of supply;

(ii) Power generated from their own renewable energy sources and consumed in their area of supply;

(iii) Power purchased from NTPC VidyutVyapar Nigam Ltd. (NVVN) as solar part of bundled power at the rate specified in the Central Electricity Regulatory Commission's regulations / orders.

(b) Captive Consumers-

Power wheeled and actually consumed from their own renewable energy sources without availing RECs or any preferential measures in the form of concessional / promotional transmission or wheeling charges, banking facility benefit and waiver of electricity duty / tax.

(c) Open access consumers –

Power wheeled and actually consumed from any renewable energy sources without availing RECs or any preferential measures in the form of concessional / promotional transmission or wheeling charges, banking facility benefit and waiver of electricity duty / tax.

3.11. As provided in Regulation 3 of the said Regulations, in the first phase, RPO compliance shall be implemented for captive and open access consumers whose

sanctioned demand is 2 MVA and above from the date of commencement of the said regulations. In the second phase, RPO compliance shall be implemented for captive and open access consumers whose sanctioned demand is 1 MVA and above from 01-04-2012. In the third and final phase, RPO compliance shall be implemented for all captive and open access consumers irrespective of the sanctioned demand from 01-04-2013.

3.12. A question arose before the Hon'ble APTEL whether a cogeneration plant would be required to comply with RPO Obligations and the above issue came to be determined by the Hon'ble APTEL in its order dated 26-04-2010 in Appeal No.57 of 2009, Century Rayon Vs. MERC wherein it was held inter-alia as follows:-

"xxxxxxxxxxxx

(V) Under the scheme of the Act, both Renewable Source of Energy and cogeneration power plant, are equally entitled to be promoted by State Commission through the suitable methods and suitable directions, in view of the fact that cogeneration plants, who provide many number of benefits to environment as well as to the public at large, are to be entitled to be treated at par with the other renewable energy sources.

(VI) The intention of the legislature is to clearly promote cogeneration in this industry generally irrespective of the nature of the fuel used for such cogeneration and not cogeneration or generation from renewable energy sources alone.

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While concluding, we must make it clear that the Appeal being generic in nature, our conclusions in this Appeal will be equally applicable to all co-generation based captive consumers who may be using any fuel. We order accordingly."

3.13. By virtue of the binding judgment of the APTEL in the Century Rayon case, captive consumers having cogenerating plants cannot be fastened with the obligation to procure electricity from renewable energy sources as that would defeat the object of section 86 (1) (e) and cogenerating plants have to be treated on par with renewable energy generating plants. The Petitioner therefore submitted that the power generated and captively used from the Petitioner's cogenerating plant should be treated on par with procurement of power from renewable sources for the purposes of complying with RPO Obligations.

3.14. In the State of Tamil Nadu, the amended definition of "obligated entities" includes captive consumers while providing for renewable power wheeled and actually consumed from their own renewable energy sources allowed to be accounted for RPO purpose. "Renewable Sources" has been defined under these regulations with reference to clause 2 (g) of the Tamil Nadu Electricity Regulatory Commission Power Procurement from New and Renewable Sources of Energy Regulations, 2008, wherein it is defined as:

"New and Renewable Sources" means the non-conventional, renewable electricity generating sources such as mini / micro hydel, wind, solar, biomass, bagasse based cogeneration, urban / municipal waste, or other such sources as approved by the Government of India or Government of Tamil Nadu (or Commission) which are generally inexhaustible and can be replenished in a short period of time.

3.15. The APTEL in the recent judgments of Emami and Vedanta Aluminium has reiterated the position already set out in the Century Rayon judgment. TheCommission has also issued a draft notification in Draft Notification No.TNERC/RPO/19/Dated -2012 and the following amendment is proposed

(ii) After sub-regulation (3), the following sub-regulation shall be inserted, namely:- "(4). The obligated entity who consumes the energy generated from the cogeneration plant irrespective of the fuel used, would be eligible for accounting the same for RPO subject to all other provisions of this Regulations."

3.16. APTEL while interpreting RPO obligated entities has specifically held that cogeneration and non-conventional energy sources have to be treated on par since they are both contained in section 86 (1) (e). Regulation 8 of the Commission RPO Regulations provides as follows:-

> "8. Power to remove difficulties – (1) The Commission shall suo-motu or on an application from any person generating electricity from renewable sources or an entity mandated under clause (e) of sub-section (1) of section 86 of the Act to fulfill the renewable purchase obligation may review, add, amend or alter these regulations and pass appropriate orders to remove any difficulty in exercising the provisions of these regulations".

The Petitioner therefore submits that appropriate directions be issued in view of the special facts and circumstances of the case.

4. Submissions made by the Petitioner in the Additional Affidavit dated 25-02-2015:-

4.1. The Petitioner's Waste Heat Recovery Boiler (WHRB) system which consists of one Waste Heat Boiler and Steam Turbine Generator for generating a power of 5 MWH (Million Watt Hours) is a co-generation plant. This Waste Heat Boiler is located downstream of the ISA furnace in Copper Smelter process. Using Off-gases (sulfur-dioxide and fine dust laden gas) from ISA furnace to generate steam from Waste Heat Boiler, is an integral part of the metallurgical process and not a stand-alone / independent operation.

4.2. Copper concentrate is the principal raw material for producing copper and has copper content varying from as low as 23% to as high as 45%, the remaining being Iron, Sulfur, Silica and lime in it. To optimize production, the concentrates procured from different sources/mines are selected in such a way that the input blend of Copper concentrate contains Copper (30-32%), Iron (25-28%), Sulfur (31-34%), Silica (3-6%), Lime (0.3-1.5%) and Moisture (6-9%). Copper concentrate along with the b fluxes are fed to ISA™ furnace through conveyors for primary smelting where it gets smelted and converted into Matte, Slag and sulfur-dioxide gas. The ISA™ furnace is vertical shaft type furnace completely refractory lined inside. There is Lance connected with air oxygen and oil supply. This Lance can be lowered / raised inside the furnace. In normal operation, the Petitioner feeds only air or oxygen through this Lance for ISA process. However, during the start-up of ISA process, it uses furnace oil for heating the ISA furnace. Generally it has only two to three startups in any given month including the breakdowns and hence consumes around 2KL of furnace oil per month in Copper smelting process.

4.3. In ISA process wet copper concentrate iscontinuously charged along with river sand and lime stones into the molten bath and air. Oxygen and air are passed into this same bath through the Lance which is controlled to maintain it immersed approximately 200 mm inside the bath. As a result of chemical reactions that take place in the bath, Iron gets oxidized with incoming oxygen and combines with silica to form slag whereas sulfur gets oxidized to sulfur-dioxide. Molten metal is tapped out through a refractory launder into Rotary Holding Furnace (RHF) where matte and slag gets separated due to difference in their specific gravities. Matte and slag are tapped out from the furnace through a tap hole which is opened intermittently. Almost all reactions in ISA process are exothermic and very little or no extra heat

energy is required and hence the process is autogenous. Off gases coming out from the furnace through the off-gas handling system is used in the Waste Heat Boiler and Evaporator.

4.4. The following chemical reaction occurs in ISA process:

(a)	$10CuFeS_2$ chalcopyrite	+	15.50_2	=	$[5Cu_2S+ 3FeS]$ matte 60%	+	$7FeO+12 SO_2$ wustite
(b)	$3FeO$ wustite	+	$1/2O_2$	=	Fe_3O_4magnetie	+	HEAT
(c)	$31Fe_3 0_4$ magnetie	+	$10CuFeS_2$ chalcopyrite	=	$12SO_2+ [5Cu_2S+ 3FeS]$ matte	+	100 FeO+Heatwustite
(d)	FeOwustite	+	SiO_2	=	$2FeO.SiO_2$ fayalite		
(e)	$2Fe_3O_4$ magnetite	+	C carbon (Coal)	=	$6FeO+ CO_2+$ HEAT		

4.5. The gas coming out from ISA furnace has temperature of nearly 1077^oC. But since, sulphuric acid plant requires only 285^oC, hence, for cooling the gas it circulates Demineralized water through Waste Heat Boiler channels and Evaporator. Heat transfer takes place between gas and water. Gas temperature is reduced and water becomes steam with 280^oC and 66 bar. The saturated steam with 280^oC and 65 bar pressure is used for power generation in saturated Steam Turbine Generator (5MW/Hr) and after power generation condensate goes to ACC (Air cooled condenser) and then after cooling (59^oC) the same condensate comes to the Waste Heat Boiler for reuse. The saturated steam with 64 bar pressure rotates the rotor in the Steam Turbine Generator to generate power. Here, Thermal energy is converted to Mechanical energy then it is converted into electrical energy to get the power.

5. Findings of the Commission:-

5.1. The main prayer of the Petitioner is to declare that the generation from the Petitioner's 5 MWH Waste Heat Recovery Power Plant would be entitled to account for RPO under the TNERC (Renewable Energy Purchase Obligations) Regulations, 2010. The Petitioner has made this claim based on the Hon'ble APTEL's order dated 26-04-2010 in Appeal No.57 of 2009 (Century Rayon Vs MERC). In the said order, the APTEL declared that the energy generated from all co-generation power plants who may be using any fuel are eligible for accounting for RPO.

5.2. Subsequent to the judgment in the case of Century Rayon, the APTEL issued two more orders related to the prayers similar to the Petitioner herein. In the APTEL's order issued on 10-04-2013 on Appeal No.125 of 2012 in the matter of M/s.Hindalco Industries limited Vs UPERC, the APTEL reiterated its findings in Century Rayon case that the energy generated from all co-generation power plants who may be using any fuel are eligible for accounting for RPO. The APTEL has also observed that the said order attained finality and arebinding on the State Commission. Accordingly, the APTEL directed the UPERC not to enforce RPO on the captive consumers who have met the specified percentage of energy from the captive co-generation plant using any fuel and to exempt them from RPO obligation inconsonance with the finding of the tribunal in Century Rayon case. Unlike the UPERC, the Tamil Nadu Electricity Regulatory Commission (TNERC) has strictly followed the APTEL's judgment in Century Rayon case and allowed the energy generated from fossil-fuel co-generation plant for the purpose of accounting for RPO in its order dated 28-09-2012 on M.P.No.19 of 2011 in the matter of M/s Hi-tech Carbon Vs Nil. Though the Commission's Renewable Energy Purchase Obligation

Regulation 2010 did not permit the energy generated from fossil fuel based co-generation plants for the purpose of accounting for RPO, the Commission permitted such energy for RPO purpose as directed by the APTEL inAppeal Nos.57 of 2009. Therefore, the Commission strictly followed the orders of APTEL in compliance of this principle of judicial discipline.

5.3. However, the APTEL in its Order dated 2-12-2013 in Appeal No.53 of 2012 Lloyds Metal and Energy Ltd Vs MERC and others has reviewed and revised partially their opinion on the question of the fuel/source used for generating power in a generating plant for fastening RPO as per Section 86(1)(e) of the Act. In the said order, the APTEL made certain categorical observations on the renewable purchase obligation (RPO) under section 86(1)(e) holding that such obligation can be fastened only from electricity generated from renewable sources of energy and it cannot be fastened on the energy generated from Fossil Fuel Based Co-generation. The related parts of the order are reproduced below:

"11. In order to find out the intention of the legislature while enacting the Electricity Act, 2003 in regard to promotion of co-generation and generation from renewable sources of energy for construction of Section regarding Purchase Obligation under Section 86(1)(e), let us examine the Report of the Standing Committee on energy on the Electricity Bill presented to LokSabha on 19.12.2002. The relevant extracts of the Report indicating the salient features of the Bill are as under:-

***"I. Generation** (i) Generation would be free from licensing. Generation would need to conform to technical standards for grid connectivity and co-ordinate with the transmission utility for evacuation of power.*

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(v) Generation from non-conventional and renewable sources is to be promoted and Regulatory Commissions may from time to time prescribe a minimum percentage of power to be purchased from such sources."

The *Report of the Standing Committee on energy clearly indicates that the intention of the legislature while enacting the Electricity Act, 2003 was that the generation from non-conventional and renewable sources is to be promoted and the Commissions may from time to time prescribe a minimum percentage of power to be purchased from such (non-conventional and renewable) sources.*

12. Now let us examine the National Electricity Policy ('NEP'). The relevant extracts are as under:

"5.12 COGENERATION AND NON-CONVENTIONAL ENERGY SOURCES

5.12.1 Non-conventional sources of energy being the most environment friendly there is an urgent need to promote generation of electricity based on such sources of energy.

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13. Clause 5.12.1 of the NEP emphasis that there is urgent need to promote generation based on non-conventional sources of energy as such sources are environment friendly. Besides making efforts to reduce the cost of energy for such sources, adequate promotional measures have to be taken for development of technologies and sustained growth of these sources.

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15. .....Admittedly, the electricity generation from co-generation from fossil fuel is not a generation from non-conventional sources of energy or renewable sources of energy

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17. Thus, the National Electricity Policy stipulates specifying of a percentage of total consumption in the area of the Distribution Licensee by the State Commission only from non-conventional or renewable sources of energy.....

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18. . . . . Even if it is assumed that co-generation stated in Clause 5.12.3 also includes fossil fuel based co-generation, this Clause only provides that the State Commission may promote arrangements for purchase of surplus power from such plants in the overall interest of energy efficiency and grid stability.

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20. In the Century Rayon judgment, all the sub-Clauses of Clause 5.12 of NEP have not been referred to. Century Rayon judgment only refers to Sub-Clause 5.12.3 and not Sub-Clauses 5.12.1 & 5.12.2. Complete reading of all sub-Clause of Clause 5.12 of NEP only gives the correct perspective of the National Electricity Policy as described in the earlier paragraphs of the present judgment.

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"25. The Tariff Policy also stipulates fixation of purchase obligation and preferential tariff only from non-conventional or renewable sources of energy and not fossil fuel based co-generation.

29. The amended Clause 6.4 of the Tariff Policy clearly indicates that under Section 86(1)(e) of the Electricity Act, the Appropriate Commission has to fix the minimum percentage of total consumption of Electricity in the area of Distribution Licensee for purchase of energy from non-conventional and renewable sources of energy including co-generation also from non-conventional and renewable sources.

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32. Plain reading of the Section 86(1) (e) read with 2(12) of the 2003 Act would reveal that the State Commission is required to promote the co-generation and generation of electricity from renewable sources of energy. Section 86(1) (e) further mandates the Commission to specify certain quantity of electricity, in percentage, to be procured from renewable sources of energy. Co-generation, as per definition given in Section 2(12) of the Act, is only a process of generation of electricity and another form of energy and cannot be termed as source of electricity.

33. This important aspect has not been considered in the Century Rayon judgment, where in this Tribunal had held that the State Commission has to promote both co-generation as well as generation of electricity from renewable sources of energy. Accordingly, we feel that the State Commission could promote the fossil fuel based co-generation by any other measures such as facilitate sale of electricity from such sources, grid connectivity, etc., but the State Commission could not compel the Distribution Licensee to procure electricity from fossil fuel based co-generation against the purchase obligation to be specified under Section 86(1)(e) of the Electricity Act, 2003.

"36. The Renewable Energy Sources are defined as Renewable sources such as mini, micro and small hydro, wind, solar, biomass including bagasse, bio fuel co-generation, urban or municipal waste and such sources as recognized or approved by the Ministry of New and Renewable Energy. The fossil fuel based cogeneration is not covered in the eligible sources. Accordingly, Tariff Regulations have not been specified for fossil fuel based cogeneration plant."

Observing inter-alia as stated above, the Hon'bleAPTEL ruled as below since the issue in the said case was limited to Distribution Licensee.

"39. Summary of our findings:

Upon conjoint reading of the provisions of the Electricity Act, the National Electricity Policy, Tariff Policy and the intent of the legislature while passing the Electricity Act as reflected in the Report of the Standing Committee on Energy presented to LokSabha on 19.12.2002, we have come to the conclusion that a distribution company cannot be fastened with the obligation to purchase a percentage of its consumption from fossil fuel based co-generation under Section 86(1)(e) of the Electricity Act, 2003. Such purchase obligation 86(1)(e) can be fastened only from electricity generated from renewable sources of energy. However, the State Commission can promote fossil fuel based co-generation by other measures such as facilitating sale of surplus electricity available at such co-generation plants in the interest of promoting energy efficiency and grid security, etc."

5.4. There was an argument that the Hon'bleAPTEL's order dated 02-12-2013 is applicable only for distribution licensee and not to captive or other generators. Though the Hon'bleAPTEL has dealt with the question of fastening the obligation of purchase of renewable energy on the Distribution Licensees under Section 86(1) (e) of the Act 2003, in the process of answering the question as seen from the parts of the order extracted above, the Hon'bleAPTEL has clearly defined and distinguished the promotion of cogeneration and generation from renewable sources of energy for the purpose of section 86(1) (e) of the Act. In the aforesaid order dated 02.12.2013 theHon'ble APTEL has categorically ruled that the electricity generation from co-generation from fossil fuel is not a generation from non-conventional sources of energy or renewable sources of energy. The emphasis of the Hon'bleAPTEL's order is clearly on the nature of the fuel/source used to generate power and accordingly

they are distinguished. This fact has been made amply clear in Para 32 of the said order of the Hon'ble APTEL extracted in para 5.3 above.

In Para 32 of the order, the Hon'bleAPTEL has clearly segregated the electricity generated from renewable sources of energy for the purpose of RPO and also declared that Co-generation is only a process of generation of electricity and another form of energy and cannot be termed as source of electricity. The Hon'bleAPTEL thus concluded that fossil fuel based cogeneration plants cannot be classified as a renewable energy source of electricity. The Hon'bleAPTEL's order has also answered the question on the measures to be taken by the Commission for the promotion of fossil fuel based cogeneration in Para 39 of the said order as below:-

"*However, the State Commission can promote fossil fuel based co-generation by other measures such as facilitating sale of surplus electricity available at such co-generation plants in the interest of promoting energy efficiency and grid security, etc."*

5.5. The co-generation of energy from the petitioner's plant is based on waste heat recovery. The Commission in its conclusion in TANFAC case vide Order dated 12-01-2009 on M.P.No.7 of 2008 had declared the following:

> *"The process involved in this plant is generation of electricity using waste heat recovered during preparation of sulphuric acid. The contention of the petitioner that no fossil fuel is used in the process is not disputed by the respondent. The Commission treats the petitioner plant as NCES based co-generation. The Commission fixes a tariff rate of Rs.3.15 per unit for the petitioner's plant, treating this on par with the NCES based generation."*

In the above order the words **"treating this on par with the NCES based generation"** is very significant. The Commission only treated the plant of the Petitioner therein on par with a "Non-Conventional Energy Sources" (NCES) plant for the purpose of tariff determination and accordingly fixed the tariff rate of Rs.3.15 per unit. Even in the said order, the Commission has not classified the Petitioner's

co-generating plant based on Waste Heat Recovery as “Renewable Energy Sources” plant.

5.6. With these background and facts, now let us analyze this specific case of the petitioner. Regarding the processes which are taking place in their "copper smelting" main plant and in the waste heat recovery power plant, the petitioner has submitted the following in their additional affidavit dated 25-02-2015:-

> “4.*It is submitted that the Petitioner's Waste Heat Recovery Boiler (WHRB) system which consists of one Waste Heat Boiler and Steam Turbine Generator for generating a power of 5 MWH (Million Watt Hours) is a co-generation plant. This Waste Heat Boiler is located downstream of the ISA furnace in Copper Smelter process. Using Off-gases (sulphur-dioxide and fine dust laden gas) from ISA furnace to generate steam from Waste Heat Boiler, is an integral part of the metallurgical process and not a stand-alone / independent operation. The petitioner is filing the present additional affidavit explaining the primary source of the fuel used by the petitioner.*
> *5.The petitioner says that Copper concentrate is the principal raw material for producing copper and has copper content varying from as low as 23% to as high as 45% the remaining being Iron, Sulphur, Silica and lime in it. To optimize production, the concentrates procured from different sources/ mines are selected in such a way that the input blend of Copper concentrate contains Copper (30- 32%), Iron (25-28%), Sulphur (31-34%), Silica (3-6%), Lime (0.3-1.5%) and Moisture (6-9%). Copper concentrate along with the fluxes are fed to ISA™ furnace through conveyors for primary smelting where it gets smelted and converted into Matte, Slag and sulphur-dioxide gas. The petitioner says that ISA™ furnace is vertical shaft type furnace completely refractory lined inside. There is lance connected with air oxygen and oil supply. This lance can be* lowered raised inside the furnace. In normal operation, the petitioner feeds only air or oxygen through this lance for ISA process. However, during the start-up of ISA process, it uses furnace oil for heating the ISA furnace. The petitioner says that generally it has only two to three start-ups in any given month including the breakdowns and hence consumes around 2KL of furnace oil per month in Copper smelting process.
> 6. The petitioner says that in ISA process wet copper concentrate is continuously charged along with river sand and lime stones into the molten bath and air. Oxygen and Air are passed into this same bath through the lance which is controlled to maintain it immersed approximately 200 mm inside the bath. As a result of chemical reactions that take place in the bath, Iron gets oxidized with incoming oxygen and combines with silica to form slag whereas sulfur gets oxidized to sulfur-dioxide. Molten metal is tapped out through a refractory launder into Rotary Holding Furnace (RHF) where matte and slag gets separated due to difference in their specific gravities. Matte and slag are tapped out from the furnace through a tap hole which is opened intermittently. Almost all reactions in ISA process are exothermic and very

little or no extra heat energy is required and hence the process is autogenous. Off gases coming out from the furnace through the off-gas handling system is used in the Waste Heat Boiler and Evaporator.
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7. The petitioner says that following chemical reaction occurs in ISA process:

"The petitioner states that the gas coming out from ISA furnace has temperature of nearly 1077^{o}C. But since, sulphuric acid plant requires only 285^{o}C, hence, for cooling the gas it circulates Demineralized water through Waste Heat Boiler channels and Evaporator. Heat transfer takes place between gas and water. Gas temperature is reduced and water becomes steam with 280^{o}C and 66 bar. The petitioner further states that the saturated steam with 280^{o}C and 65 bar pressure is used for power generation in saturated Steam Turbine Generator (5MW/Hr) and after power generation condensate goes to ACC (Air Cooled Condenser) and then after cooling (59^{o}C) the same condensate comes to the Waste Heat Boiler for reuse. The saturated steam with 64 bar pressure rotates the rotor in the Steam Turbine Generator to generate power. Here, Thermal energy is converted to Mechanical energy then it is converted into electrical energy to get the power."

5.7 As per the report of the Petitioner, their waste heat recovery cogeneration plant uses the heat generated from the exothermic reaction process of their copper smelting main plant. Almost all the process are exothermic and very little or no extra heat energy is required and hence the process is autogenous. In normal operation, the petitioner feeds only air or oxygen but during the start-up of ISA process, it uses furnace oil for heating the furnace. The petitioner reports that generally it has only two to three start-ups in any given month including the breakdowns and consumes around 2KL of furnace oil per month.

5.8. As per the Hon'bleAPTEL's latest order on the subject matter as has been narrated above, the energy generated from renewable sources only qualifies for RPO entitlement. Petitioner's plant is a waste heat based cogeneration plant using fossil fuel. The use of waste heat for power generation was treated on par with non-conventional energy source in the Commission's Order dated 12-01-2009, but not as

a renewable energy source. Let us now analyze whether the energy generated by the petitioner is eligible for RPO purpose as per the Commission's Regulations and in consonance with Hon'bleAPTEL's Order. Regulation 3 of the Commission's (Renewable Energy Purchase Obligation) Regulation 2010 specifies the following criteria for accounting a particular energy for the purpose of RPO.

> *"3. Renewable Purchase Obligation:-*
>
> *x xx*
>
> *Provided further that such obligations to purchase renewable energy shall be inclusive of the purchases, if any,* ***from renewable energy sources*** *already being made by concerned obligated entity:*
> *Provided also that the renewable power purchased from the following sources and means mentioned against each obligated entity* ***shall be accounted for RPO purpose:-***
>
> ***(a) Distribution Licensees –***
>
> *(i) Power purchased from Renewable Energy Sources under preferential tariff as fixed by the Commission and consumed in their area of supply;*
>
> *(ii) Power generated from their own* ***renewable energy sources*** *and consumed in their area of supply;*
>
> *(iii) Power purchased from NTPC VidyutVyapar Nigam Ltd. (NVVN) as solar part of bundled power at the rate specified in the Central Electricity Regulatory Commission's regulations / orders.*
>
> ***(b) Captive consumers –***
>
> *Power wheeled and actually consumed from their own* ***renewable energy sources*** *without availing RECs or any preferential measures in the form of concessional / promotional transmission or wheeling charges, banking facility benefit and waiver of electricity duty / tax.*
>
> ***(c) Open access consumer –***
>
> *Power wheeled and actually consumed from any* ***renewable energy sources*** *without availing RECs or any preferential measures in the form of concessional / promotional transmission or wheeling charges, banking facility benefit and waiver of electricity duty / tax.*

5.9. In all the above cases, for the purpose of accounting for RPO, the source of energy has been specified as "Renewable Energy Sources". Whether the petitioner qualifies to be of renewable sources has to be tested as per, Regulation 2(1) of Renewable Energy Purchase Obligation Regulation 2010 and Regulation 2(1)(g) of New and Renewable Energy Regulation 2008 which are reproduced below:

Regulation 2(1) (l)of Renewable Energy Purchase Obligation Regulations 2010:-

> *"(l)'Renewable Sources' means sources of energy as defined in the Regulation 2(1) (g) of the Power Procurement from New and Renewable Sources of Energy Regulations, 2008 issued by the Commission;"*

Regulation 2(1)(g) of New and Renewable Energy Regulations 2008:-

> *"(g)* ***"New and renewable sources"*** *means the non-conventional, renewable electricity generating sources such as mini / micro hydel, wind, solar, biomass, bagasse based cogeneration, urban/municipal waste, or other such sources as approved by the Government of India or Government of Tamil Nadu which are generally inexhaustible and can be replenished in a short period of time;*
>
> *Words or expressions occurring in these Regulations and not defined herein but defined in other Regulations published by the Commission or in the Act shall bear the same meanings respectively assigned to them in the Act / Regulation.".*

5.10 As per the above definitions and as per the orders of Hon'bleAPTEL in Appeal No.53 of 2012 dated 02-12-2013 extracted supra, for counting for the purpose of RPO, the source of power generation shall be non-conventional and renewable source. This is clearly missing in the source used in the petitioner's generating plant.

5.11 There was a mention during the argument that in the case of MERC, captive user(s) consuming power from grid connected fossil fuel based co-generation plants are exempted from applicability of RPO target. In the case of MERC, Regulation 11.3 of their Regulation on (Renewable Purchase obligation, its Compliance and implementation of REC framework) Regulations, 2010 specifically provides for such exemption. However, in the case of TNERC, for accounting for RPO, the energy source shall be "Renewable Source" as per the RPO Regulation as discussed earlier in this order. As far as the Commission's RPO Regulations are concerned, the Distribution Licensee, captive consumers and Open Access consumers are all obligated entities and are treated equally without discrimination in the matter of

complying with the RPO requirements. What is applicable to Distribution Licensee is equally applicable to other obligated entities also.

5.12 We are constrained to note that the Hon'bleAPTEL in its recent order dated 20-04-2015 made in O.P.No.1 of 2013 and I.A. No.291 and I.A. No.420 of 2013, O.P.No.2 of 2013 and O.P.No.3 of 2013 filed by Indian Wind Energy Association etc. wherein the Tamil Nadu Electricity Regulatory Commission was also a party respondent , has observed and categorically ruled as follows:-

"17. We are conscious of the findings of the Hon'ble Supreme Court in PTC case that Regulations are binding piece of subordinate legislation and if there is a Regulation then order has to be passed in consonance with such Regulation. We do not want to give any direction to defeat the renewable energy regulation notified by the State Commission or to restrict the exercise of powers of the State Commission provided in the Regulations. However, if we find that the Regulations are not being followed by the State Commission then it would be our responsibility to direct the Appropriate Commission to adhere to the Regulations while passing order regarding RPO obligations.

x xxx

28. In view of above discussions, we deem it appropriate to give directions to the State / Joint Commission with regard to implementation of Renewable Energy Regulations in their respective States. The Tribunal after considering the contentions of the Petitioners and the States / Joint Commissions, Central Commission and MNRE gives the following directions to the States / Joint Commissions under section 121 of the Act.

x xxx

"(v) The State Commissions are bound by their own Regulations and they must act strictly in terms of their regulations.

(vi) The provisions in Regulations like power to relax and power to remove difficulty should be exercised judicially under the exceptional circumstances, as per law and should not be used routinely to defeat the object and purpose of the Regulations".

5.13 The Hon'bleAPTEL's above directions thus mandate the Commission not to deviate from its own Regulations. Further as discussed supra, the Hon'bleAPTEL's order in Appeal No: 53 of 2012 specifies that **the State Commission can promote fossil fuel basedco-generation by other measures such as facilitating sale of surplus electricity available at such co-generation plants in the interest of**

promoting energy efficiency and grid security, etc. The said order does not provide for accounting of the energy generated from all cogeneration plants for the purpose of RPO.

5.14 Since the petitioner's co-generation plant is not satisfying the eligibility criteria for the purpose of accounting the energy generated therefrom for RPO as per the Hon'bleAPTEL's order on Appeal No: 53 of 2012 dated 02-12-2013 and the Commission's Renewable Energy Purchase Obligation Regulations, 2010, we declare that the power generated from the petitioner's co-generation Power Plant is not entitled to account for RPO.

5.15 In view of the above findings, the prayer of the Petitioner in M.P.No.82 of 2013 cannot be conceded and therefore M.P.No.82 of 2013 is hereby dismissed.

6. Appeal:-

An appeal against this order shall lie before the Appellate Tribunal for Electricity under section 111 of the Electricity Act, 2003 within a period of 45 days from the date of receipt of a copy of this order by the aggrieved person.

(Sd .....)	(Sd.....)	(Sd.....)
(Dr.T.PrabhakaraRao)	**(G.Rajagopal)**	**(S.Akshayakumar)**
Member	**Member**	**Chairman**

/ True Copy /

Secretary
Tamil Nadu Electricity
Regulatory Commission