1	**ID: 52**	**Title of measure**	**Sector: Hospitals**
2	**Survey Year: 2007**	**Use of steam from boiler to meet the hot water requirement at New Block**	**Technology : Rationalization of water heating**
3	Name of the Company	:	**Batra Hospital & Medical Research Centre, New Delhi, INDIA**
4	Agency that executed the project	:	DSCL Energy Services Co. Limited, New Delhi
5	Year of Implementation	:	2006-07

6 **Unit Profile:**

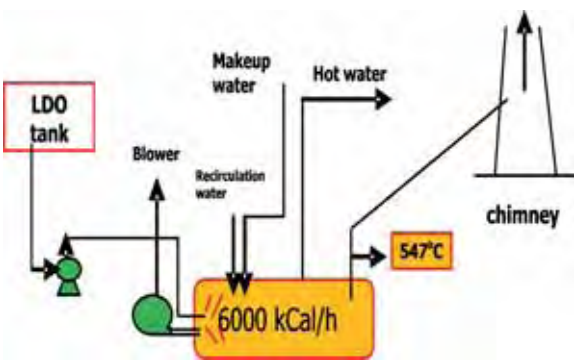
Batra Hospital and Medical Research Centre was founded in 1987. The Hospital meets the objective of providing high quality Medicare with value for money for privileged patients and at the same time offers its charitable services for the economically weaker sections of society. Batra Hospital offers over 42 specialties, ranging from Cardiology, Oncology, Nephrology and Nuclear Medicine, to Pediatrics, Gynecology and Obstetrics, dentistry and Physiotherapy.

7 **Description of Energy Conservation Measure:-**

There are 3 nos of hot water generators (1 no. of 6000 kCal/hr and 2 nos of 3000 kCal/hr each) of which the 6000 kCal/hr generator and one 3000 kCal/hr generator were in operation. The hot water temperature varies from 60-65 deg C. The flue gas temperature measured at the outlet of the HWG was 547 deg C and the operating efficiency was about 65%.

The boilers at the old block had sufficient margin to generate steam to meet the requirement of hot water for the new block. The efficiency of the boiler was about 80% and was expected to go up after installation of the economizer. It was suggested to install a steam pipeline up to the hot water tank at the new block and cut off the HWG. This was implemented along with a new 10 kL tank.

8 **Picture Before Modification**



Picture After Modification

Steam Heated System

9	Total investment :		45,000 US$
10	First year energy cost savings :		55,000 US$
11	First year additional savings beyond energy (i.e. water, raw materials etc.):		Nil
12	Annual oil consumption before,	kl	—
13	Annual oil consumption after,	kl	—
14	First year oil savings,	kl	69
15	First year tons of CO_2 mitigated		208
16	Assumed sustainability, years		10
17	**Expected tons of CO_2 mitigated throughout life cycle**		**2,080**

1	**ID: 53**	**Title of measure**	**Sector: Hospitals**
2	**Survey Year: 2007**	**Installation of Energy Efficient lighting system in old and new blocks**	**Technology : Energy Efficient Lighting**
3	Name of the Company	:	**Batra Hospital & Medical Research Centre, New Delhi, INDIA**
4	Agency that executed the project	:	DSCL Energy Services Co. Limited, New Delhi
5	Year of Implementation	:	2006-07

6 **Unit Profile:**

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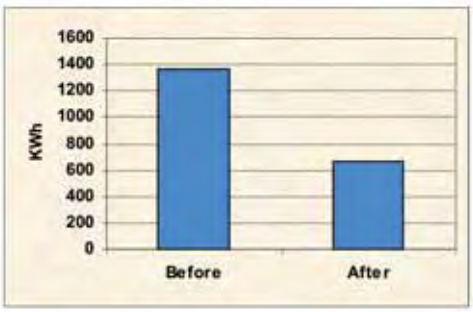
7 **Description of Energy Conservation Measure:-**

The following were the measures implemented in the lighting system at the new and old blocks

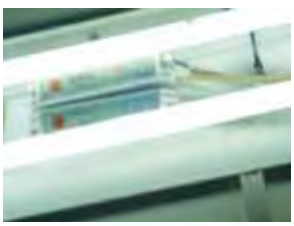
- Change of 4ft T8 FL (Magnetic ballast) with High Lumen T8 (Electronic Ballast)
- Change of 2 ft T12 FL (Magnetic ballast) with High Lumen T8 (Electronic Ballast)
- Change of 60 W GLS with 13 W CFL
- Change of 30 W GLS with 10 W CFL
- Change of 15 W GLS with 5 W CFL

(In the above cases the double fittings were changed to single fittings with reflectors)

8 **Graph showing Electricity Consumption Before And After Modification**



Picture After Modification



9	Total investment :		57,500 US$
10	First year energy cost savings :		107,500 US$
11	First year additional savings beyond energy (i.e. water, raw materials etc.):		Nil
12	Annual electricity consumption before,	MWh	1,365
13	Annual electricity consumption after,	MWh	670
14	First year electricity savings,	MWh	695
15	First year tons of CO_2 mitigated		695
16	Assumed sustainability, years		10
17	**Expected tons of CO_2 mitigated throughout life cycle**		**6,950**

1	**ID: 54**	**Title of measure**	**Sector: Hospitals**
2	**Survey Year: 2007**	**Heat Recovery by installation of economizer in the boiler**	**Technology: Economizer**
3	Name of the Company	:	**Batra Hospital & Medical Research Centre, New Delhi, INDIA**
4	Agency that executed the project	:	DSCL Energy Services Co. Limited, New Delhi
5	Year of Implementation	:	2006-07

6 **Unit Profile:**

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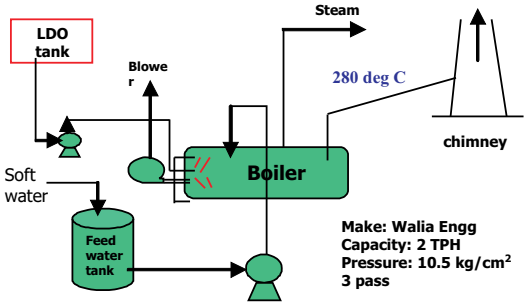
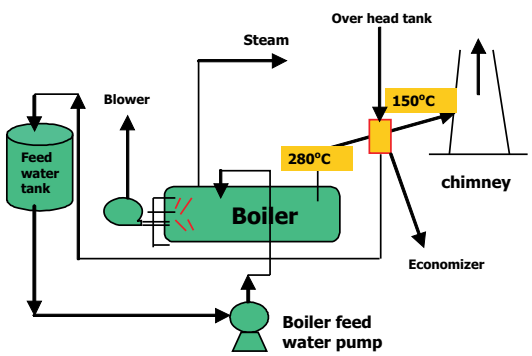
7 **Description of Energy Conservation Measure:-**

Batra Hospital has 2 nos of 2 TPH fire-tube boilers (one standby). Steam is generated at a pressure of 7.5 to 8.5 kg/cm^2. The flue gas temperature was measured to be 280 deg C. This high temperature increased the losses in the boiler. It was suggested to install an economizer in the flue gas path to recover the heat from the flue gases. This would heat up the boiler feed water and hence the total system efficiency would increase. The economizer was installed along with 2 boiler feed water tanks.

8 **Picture Before Modification**



Picture After Modification



9	Total investment :	25,000 US$
10	First year energy cost savings :	18,750 US$
11	First year additional savings beyond energy (i.e. water, raw materials etc.):	Nil
12	Annual oil consumption before, kl	450
13	Annual oil consumption after, kl	422
14	First year oil savings, kl	28
15	First year tons of CO_2 mitigated	84
16	Assumed sustainability, years	10
17	**Expected tons of CO_2 mitigated throughout life cycle**	**840**

1	**ID: 55**	**Title of measure**	**Sector: Hospitals**
2	**Survey Year: 2007**	**Stopping the pumps by doing online chlorination of the water**	**Technology: Pumps**
3	Name of the Company	:	**Batra Hospital & Medical Research Centre, New Delhi, INDIA**
4	Agency that executed the project	:	In-house
5	Year of Implementation	:	2006-07

6 **Unit Profile:**

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7 **Description of Energy Conservation Measure:-**

Initially there were 2 pumps running to deliver soft water and chlorinated water to the over head tanks. The in-house team recommended the chlorination to be done online. By carrying out some minor modifications, chlorination was done online at the soft water pumps and hence the chlorinated water pumps were stopped.

8

Batra Hospital and Medical Research Centre

Picture After Modification

9	Total investment :	Nil
10	First year energy cost savings :	36,250 US$
11	First year additional savings beyond energy (i.e. water, raw materials etc.):	Nil
12	Annual electricity consumption before, MWh	-
13	Annual electricity consumption after, MWh	-
14	First year electricity savings, MWh	295
15	First year tons of CO_2 mitigated	295
16	Assumed sustainability, years	10
17	**Expected tons of CO_2 mitigated throughout life cycle**	**2,950**