


**FORM IV**  
**(Refer regulation 7(2))**  
**Bureau of Energy Efficiency**  
**REGISTER CONTAINING NAMES OF OFFICES AND FIRMS OF ACCREDITED**  
**ENERGY AUDITORS**

Serial Number (AEA- 0082)		As on:- 26 February, 2013	
<b>A.</b>			
1	Name of accredited energy auditor	Manoj Kumar Bansal	
2	Father's name	Satya Dev Bansal	
3	Date of certification as Energy Auditor	18 <sup>th</sup> Nov. 2005	
4	Date of passing the examination in "Energy Performance Assessment for Equipment and Utility Systems"	18 <sup>th</sup> Nov. 2005	
5	Examination Registration Number of (i) Energy Manager (ii) "Energy Performance Assessment for Equipment and Utility Systems"	EA – 0578	
6	Certificate Registration Number of (i) Energy Manager (ii) "Energy Performance Assessment for Equipment and Utility Systems"	EA – 0578	
7	Date of issue of accreditation certificate	( to be filled by BEE)	
<b>B. Information in respect of trade name or firms' name</b>			
8	Trade name / firms name under which energy audit is proposed to be conducted	<b>PricewaterhouseCoopers Private Limited</b>	
9	Date of accreditation as accredited energy auditor	( to be filled by BEE)	
10	Type of firm/ private/ Government / NGO etc.	Private Limited	

11	Name of contact person along with designation, address, telephone, mobile and fax number along with STD codes and email address (All details compulsory)	<b>Amit Kumar</b> Associate Director (GRID-Energy & Utilities) PricewaterhouseCoopers ( <a href="http://pwc.com">pwc.com</a> ) 17 <sup>th</sup> Floor, Building – 10C, DLF Cyber City, Phase – II, Gurgaon, 122002 Direct: +91 124 330 6028 Board: +91 124 330 6000 Mobile: +91 9899452400 Fax: +91 124 330 6999 Email: amit2.kumar@in.pwc.com
12	Professional postal address with Pin Code of the accredited energy auditor	PricewaterhouseCoopers Pvt. Ltd., 17 <sup>th</sup> Floor, Building – 10C, DLF Cyber City, Phase – II, Gurgaon, 122002, India
13	E-mail address	manoj.bansal@in.pwc.com
14	Telephone numbers with STD Code (R) (O) Mobile no:	+91 (11) 45567257 +91 (124) 3306257 +91 9910154500
15	Year of establishment of the trade name / firms' name for undertaking the energy audit	On 26 <sup>th</sup> March 1983, at Kolkata. Firm was established as PricewaterhouseCoopers Limited and on 8 <sup>th</sup> March 2001 name was changed to PricewaterhouseCoopers Private Limited
16	Year of commencement of energy audit of the firm	2007
17	Whether any certificate to support the excellence in the system has been obtained (ISO etc.)	ISO 9001:2008, ISO/IEC27001:2005, TICK IT
18	No. of branch offices (List of complete addresses including heads of all branch offices with telephone, fax and email addresses)	15
<b>C</b>	<b>Details of Associated Energy Experts</b>	
19	Number of resource persons available	25
20	I. Number of full-time energy auditors in position with work experience of all energy auditors associated with the firm	

**Name of Resource Person 1:** Mr. Manoj Kumar Bansal

**Energy Audit Registration No.:** EA - 578

**Years of Experience:** >12 Years

<b>Energy Audit Sectors:</b>	<b>Contact Details</b>
<ul style="list-style-type: none"><li>• Power Plants</li><li>• Iron &amp; Steel</li><li>• Pulp &amp; Paper</li><li>• Cement</li><li>• Petrochemicals</li><li>• Pharmaceuticals</li><li>• Textiles</li><li>• Automobiles</li><li>• Engineering</li><li>• Commercial Buildings</li><li>• Municipalities</li><li>• MSME</li></ul>	PwC, Manager Energy, Utilities and Mining Direct: +91 (124) 3306257 Mobile: +91 9910154500 Board: +91 (124) 3306000 Fax: +91 (124) 3306999 Email: <a href="mailto:manoj44@gmail.com">manoj44@gmail.com</a> PricewaterhouseCoopers Private Limited 17 <sup>th</sup> Floor, Building No. 10, Tower C, DLF Cyber City, Gurgaon – 122 002, India

**Brief Description:**

Manoj is working as a Manager with Energy Efficiency Practice of PricewaterhouseCoopers, India since Jan., 2008. He has more than 12 years of experience in the field of energy efficiency / energy conservation in various sectors of the economy. He has expertise in various segments of energy efficiency like energy audits, demand side management, preparation of feasibility studies and detailed project reports, demonstration of pilot projects, training and capacity building. He has executed many projects for agencies like Bureau of Energy Efficiency (BEE), the Asian Development Bank, the World Bank, BHC, GIZ, IREDA, PCRA, MoEF, DST, CPCB, PPCB, ClimateWorks, various State governments and corporate clients. He has carried out many energy audits including audits of designated consumers like Bihar Caustic & chemicals Limited, NTPC Power plants, BSL Processing Limited, Anant Syntex Limited.

From Feb. 2007 till Dec. 2007 he has worked with Winrock International India as Program Officer. As a part of the energy team he was involved in conducting detailed energy audits of energy intensive industries and buildings. He carried out detailed energy audits of many big plants/ designated consumers like GAIL, Uttam Galva Steel, Bhushan Steel, K S Oil, Cipla etc.

He worked with Conzerv Systems P Limited from Jan. 2006 till Feb. 2008 as Senior Engineer – Energy Audit. As a part of the energy team he was involved in conducting detailed energy audits of energy intensive facilities like industries and buildings. He carried out detailed energy audits of many big plants/ designated consumers like NTPC power plants at Singrauli and Auraya, Buildings like VSNL (Tata Communications Limited), Star TV, automobile plants like Sona Koyo Steering

Systems, Sandhar Auto etc.

He worked with Punjab State Council for Science & Technology from March 2001 to Dec. 2005 as Assistant Process Engineer (Consultancy Cell). In council he was involved in executing assignments on energy conservation and pollution control. He worked for the development of technologies for energy conservation for the sectors like foundries, brick kilns, rice mills, electroplating plants etc. There he designed a cupola furnace which was able to give energy savings of around 50%. He also helped a lot of SME units to save energy through better operating practices. He was also involved in training programmes for operators and firemen of these units.

**Name of Resource Person 2:** Mr. Kulbhushan Kumar

**Energy Audit Registration No.:** EA - 1639

**Years of Experience:** >15 Years

<b>Energy Audit Sectors:</b>	<b>Contact Details</b>
<ul style="list-style-type: none"><li>• Textile</li><li>• Power Plant</li><li>• Chemical</li><li>• Paper</li><li>• Engineering</li><li>• Cement</li><li>• Aluminum</li><li>• Chloro-alkali</li><li>• Petrochemical</li></ul>	PwC, Senior Manager Energy, Utilities and Mining Direct: +91 (124) 3306000 Mobile: +91 (0) 97 1109 1007 Email: kulbhushan.kumar@in.pwc.com PricewaterhouseCoopers Private Limited 17 <sup>th</sup> Floor, Building No. 10, Tower C, DLF Cyber City, Gurgaon – 122 002

**Brief Description:**

Kulbhushan Kumar has more than 15 years of experience in energy efficiency area and is working as Sr. Manager in Energy Utility & Mining (EU&M) group of PricewaterhouseCoopers India.

He performed as team leader for large number of energy audit studies covering a wide range of industrial units and commercial buildings including hotels and hospitals in India. Kulbhushan has worked with many bilateral and multilateral agencies on energy management and renewable energy assignments. During his term of more than 4 years with PwC, he was involved in a project providing retainer consultancy services to Bureau of Energy Efficiency (BEE) for the Agriculture Demand Side Management (Ag DSM) Programme. He has active part in implementing the first pilot DSM project in agriculture sector in Solapur, Maharashtra. He has experience in analysing feasibility studies, Bid Process Management, Financial Modelling, Development of Business Models, demand assessment and other aspects of consulting Industry.

**Name of Resource Person 3:** Mr. Jayakrishnan P Nair

**Energy Audit Registration No.:** EA - 0252

**Years of Experience:** >14Years

<b>Energy Audit Sectors:</b>	<b>Contact Details</b>
<ul style="list-style-type: none"> <li>• Iron &amp; Steel</li> <li>• Foundry</li> <li>• Fertilizers</li> <li>• Chemicals</li> <li>• Pharmaceuticals</li> <li>• Textiles</li> <li>• Railways</li> <li>• Petroleum</li> <li>• Engineering</li> <li>• Telecommunication/Data Centers</li> <li>• Commercial Buildings</li> </ul>	PwC , Manager Energy, Utilities and Mining Direct: +91 (124) 3306000   Mobile: +91 (0) 99 1008 2154 Email: jayakrishnan.nair@in.pwc.com PricewaterhouseCoopers Private Limited 17 <sup>th</sup> Floor, Building No. 10, Tower C, DLF Cyber City, Gurgaon – 122 002

**Brief Description:**

Jayakrishnan P Nair has more than 14 years of experience in energy efficiency area and he is Presently working with PricewaterhouseCoopers Pvt. Ltd. as Manager in the Energy Efficiency Practice of the firm. Among other assignments, conducted Baseline energy audits for 09 Designated Consumers in the Textile Sector, under the PAT scheme.

Worked with TUV SUD South Asia Pvt. Ltd., From Feb 2006 till December 2010 as Energy Auditor. Was involved in conducting some energy audits for energy intensive industries and buildings. TUV SUD was the retainer consultant to BEE for the national programme of Municipal Demand Side Management (MuDSM). He was coordinating the programme, he was participated in designing and specifying the DPR format and requirements, and he does the technical review of more than 75 DPRs prepared by consultants. Bankable DPRs were ensured with Measurement and verification (M&V) aspects as well as project IRR calculations.

Worked with SGS India Pvt. Ltd. as Executive / Energy Auditor from April 2000 to Jan 2006. He was part of More than 40 Energy Audits in various industries and building, including energy intensive industry sectors

**Name of Resource Person 4:** Mr. Rajeev Ralhan

**Energy Audit Registration No.:** EA - 577

**Years of Experience:** >11Years

<b>Energy Audit Sectors:</b>	<b>Contact Details</b>
<ul style="list-style-type: none"> <li>• Iron &amp; Steel</li> <li>• Cement Plants</li> <li>• Textile Units</li> <li>• Electroplating Units</li> <li>• Non Ferrous Plant (Graphite Plants)</li> <li>• Food Processing</li> </ul>	PwC , Senior Manager Energy, Utilities and Mining Direct: + (91) 124 3306259 Mobile: +91 9910063775 Email: rajeev.ralhan@in.pwc.com PricewaterhouseCoopers Private Limited 17 <sup>th</sup> Floor, Building No. 10, Tower C, DLF Cyber City, Gurgaon – 122 002

- Buildings
- Glass Units
- MSME
- Brick Kilns

***Brief Description:***

Rajeev Ralhan has more than 11 years of experience in energy efficiency area and he is presently working with PricewaterhouseCoopers Pvt. Ltd. as Senior Manager in the Energy Efficiency Practice of the firm. He worked in the area of energy efficiency with various prestigious clients which includes Bureau of Energy Efficiency (BEE), World Bank, ADB, AfD, British High Commission/DFID, IREDA, PCRA, CLASP, Shakti foundation and more. He is working very closely with BEE team on prestigious programs like Buildings, PAT, Appliance standards & Labeling and other programs. He has experience in following areas. ( Jan 2008- Till Date)

- Managed BEE's program for Baseline studies for Textile Units.
- Managing energy efficiency program of BEE for Buildings and creating true investment grade audit reports for implementation. Created pilot templates for investment grade audit reports, M&V plan, sample performance contracts to be adopted at National level.
- Capacity Building Initiatives for energy efficiency in the country.
- Managing Appliance Standard & Labeling Program
- Representing at various forum of BEE and other agencies for promoting energy efficiency in the country.
- Developed Business Plan of EESL.
- Certified Monitoring & Verification Expert in 2011
- Green Belt – Lean Six Sigma Specialist in 2012 ( Yet to receive certificate in this regard)

Worked with Winrock International India from July 2006 till January 2008 as Program Officer. He worked with various prestigious clients like World Bank, PCRA, IREDA, British High Commission and Private Clients. He was involved in doing following activities.

Energy audits of Bhushan Steels, KS Oil, HEG limited, Steel Industries and other industries. Was involved in developing energy efficiency measures in SME units in India and auditing of these industries. It includes energy interventions in clusters of forging, utensils, steel and more. Organized 30 capacity building programs for bankers across India for awareness for energy efficiency. Set up various demonstration projects in different clusters for energy efficiency initiatives.

Worked with Punjab State council for Science and Technology, Chandigarh as Assistance Process Engineer from 2000 to 2006. He played key role in this organization was to promote energy efficiency in small and medium scale industries.

Designed and Developed Energy efficiency/conservation options for SME cluster which includes Rolling Mills, Brick Kilns, Electroplating Units, Forging Units, Dyeing units, Rice shellers, Induction furnaces, Laminating Units, Fluidized Bed Boilers etc.

Worked on analysis of various fuel options for industrial applications which includes coal, furnace oil, LDO and producer gas from Gasification process. Worked on designing furnaces, burners, fans for industrial applications. Worked on application of pulverized coal in industries especially steel industries. Designed Environmental solutions for various industries. Organized onsite training programs for work force and operators regarding better practices.

Worked with Cad Chem Pvt.Ltd. as Production Engineer from 1999 to 2000. Cad Chem was a pharmaceutical unit in Punjab.

**Name of Resource Person 5:** Mr. Anurag Verma

**Energy Audit Registration No.:** EA - 13187

**Years of Experience:** >5 Years

<b>Energy Audit Sectors:</b>	<b>Contact Details</b>
<ul style="list-style-type: none"> <li>• Cement Plants</li> <li>• Textile Units</li> <li>• Pharmaceuticals</li> </ul>	PwC , Senior Consultant Energy, Utilities and Mining Direct: +91 (124) 3306214 Mobile: +91 (0) 97 1749 4565 Email: anurag.x.verma@in.pwc.com PricewaterhouseCoopers Private Limited 17 <sup>th</sup> Floor, Building No. 10, Tower C, DLF Cyber City, Gurgaon – 122 002

**Brief Description:**

Anurag Verma has more than 5 years of experience in energy efficiency area and he is Presently working with PricewaterhouseCoopers Pvt. Ltd. as Senior Consultant in the Energy Efficiency Practice of the firm. He has been working in the area of energy efficiency with various prestigious clients which includes Bureau of Energy Efficiency (BEE), World Bank, ADB, , IREDA, and more. He is working very closely with BEE team on prestigious programs like PAT, Appliance standards & Labeling and other programs. He have experience in analyzing feasibility studies, Bid Process Management, Financial Modeling, Development of Business Models, demand assessment and other aspects of consulting Industry.

**Name of Resource Person 6:** Mr. Niranjana Rao Devela

**Energy Audit Registration No.:** EA - 14470

**Years of Experience:** >4 Years

<b>Energy Audit Sectors:</b>	<b>Contact Details</b>
<ul style="list-style-type: none"> <li>• Textile</li> <li>• Pharmaceutical</li> <li>• Iron &amp; Steel</li> <li>• Engineering</li> <li>• Buildings</li> <li>• Municipality</li> </ul>	PwC , Consultant Energy, Utilities and Mining Direct: +91 (124) 3306210 Mobile: +91 (0) 9560003730 Email: niranjan.r.devela@in.pwc.com PricewaterhouseCoopers Private Limited 17 <sup>th</sup> Floor, Building No. 10, Tower C, DLF Cyber City, Gurgaon – 122 002

**Brief Description:**

Niranjan rao has more than 4 years of experience in energy efficiency area and he is Presently working with PricewaterhouseCoopers Pvt. Ltd. as Consultant in the Energy Efficiency Practice of the firm. He is expertise in various segments of energy efficiency like energy audits, demand side management, preparation of feasibility studies and detailed project reports, training and capacity building.

He worked with APPC-Hyderabad as Assistant Director. As a part of the energy team he was involved in conducting detailed energy audits of energy intensive industries and buildings. He carried out detailed energy audits of many plants/ designated consumers like Pennar, VPT, Cochin Shipyard, Srini Phrma,etc

**Name of Resource Person 7:** Mr. Pradeep Singhvi

**Energy Audit Registration No.:** EA - 14558

**Years of Experience:** >4 Years

<b>Energy Audit Sectors:</b>	<b>Contact Details</b>
<ul style="list-style-type: none"> <li>• Iron &amp; Steel</li> <li>• Buildings</li> </ul>	PwC , Consultant Energy, Utilities and Mining Direct: +91 (124) 330 6207 Mobile: +91 95 6060 0710 Email: p.singhvi@in.pwc.com PricewaterhouseCoopers Private Limited 17 <sup>th</sup> Floor, Building No. 10, Tower C, DLF Cyber City, Gurgaon – 122 002

**Brief Description:**

Pradeep has more than 4 years of experience in energy efficiency area and he is Presently working with PricewaterhouseCoopers Pvt. Ltd. as Consultant in the Energy Efficiency Practice of the firm. He have expertise in energy audits, demand side management and preparation of feasibility studies He worked with Ispat steel industries as a Engineer. As a part of the energy management team he was involved in conducting energy audit of steel plant.

II. No. of part-time energy auditors in position during the current year / previous year associated with the energy auditor / energy auditor's firms.

Nil

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Sectors in which the energy auditor/ energy audit firm has conducted energy audits since inception:

<b>S. N O</b>	<b>NAME OF ENERGY AUDITOR</b>	<b>SECTORS</b>	<b>S. N O</b>	<b>NAME OF ENERGY AUDITOR</b>	<b>SECTORS</b>
1	Kulbhushan Kumar	Textile	3	Rajeev Ralhan	SMEs
		Power Plant			Textile
		Chemical			Chlor-Alkali
		Paper			Buildings



2		Engineering	4	Manoj Bansal	Power Plants		
		Cement			Iron & Steel		
		Aluminum			Pulp & Paper		
		SMEs			Cement		
		Chlor-Alkali			Automobiles		
		Petro chemical			Chlor-Alkali		
					Textiles		
	Jayakrishnan P. Nair	Railways	5	Pradeep Singhvi	Buildings		
		Petroleum			Iron & Steel		
		Chemical/Pharmaceutical			Buildings		
		Textile			6	Anurag Verma	Textile
		Engineering					Cement
		SMEs					Pharmaceutical
		Iron & Steel			7	Niranjan Rao	Textile
Foundry	Pharmaceutical						
Buildings	Iron & Steel						
Telecom & Data centers	Engineering						
			Buildings				
22	Subject wise expertise						
(a)	Energy audit process system (list sectors) - If no energy audit has been carried out of the process system and parameters, please list nil. Bureau of Energy Efficiency will be calling for detailed information in case agency has listed its energy audit expertise in the process systems		Nil				
(b)	Energy audit thermal utility system (list sectors)		<ul style="list-style-type: none"> <li>• Power Plants</li> <li>• Iron &amp; Steel</li> <li>• Pulp &amp; Paper</li> <li>• Cement</li> <li>• Petrochemicals</li> <li>• Pharmaceuticals</li> <li>• Textiles</li> <li>• Automobiles</li> <li>• Engineering</li> <li>• Food Processing</li> <li>• Commercial Buildings</li> </ul>				

		<ul style="list-style-type: none"> <li>• Municipalities (Street Lighting, Water Pumping etc)</li> <li>• MSME</li> </ul>
(c)	Energy audit electrical utility system (list sectors)	<ul style="list-style-type: none"> <li>• Power Plants</li> <li>• Iron &amp; Steel</li> <li>• Pulp &amp; Paper</li> <li>• Cement</li> <li>• Petrochemicals</li> <li>• Pharmaceuticals</li> <li>• Textiles</li> <li>• Automobiles</li> <li>• Engineering</li> <li>• Food Processing</li> <li>• Commercial Buildings</li> <li>• Municipalities (Street Lighting, Water Pumping etc)</li> <li>• MSME</li> </ul>
23	Instruments available	
	(a) Electrical (list the name of the instruments)	<ul style="list-style-type: none"> <li>• 3- Phase Portable Power Analyzer-ARL5</li> <li>• Power Analyzer-C80</li> <li>• Lux Meter</li> </ul>
	(b) Thermal (list the name of the instruments)	<ul style="list-style-type: none"> <li>• Portable Flue Gas Analyzer-KANE 900 Plus</li> <li>• Contact &amp; Non Contact Laser Tachometer- Extexh461995</li> <li>• Infrared Thermometer-Testo845</li> <li>• Thermo Hygrometer-Testo625</li> <li>• Vane Anemometer-Testo416</li> <li>• Differential Pressure Meter – Testo510</li> <li>• Ultrasonic flow meter- GE Sensing</li> </ul>
24 (i)	Details of training programme/ seminars/ workshops conducted during the last 3 years in the field of energy efficiency / energy audit	<p>I have conducted training programmes for many energy audit clients on various energy conservation measures in their plants. Some of these are:</p> <ul style="list-style-type: none"> <li>• Training programme for officers of Bihar Caustic &amp; Chemicals Limited on various energy efficiency opportunities in June, 2008.</li> <li>• Conducted workshops on “Energy</li> </ul>

		<p>Efficient Street Lighting through ESCO” in Hyderabad, Rajahmundry and Tirupati in December, 2009.</p> <ul style="list-style-type: none"><li>• Conducted national level workshop on “Energy Efficient Procurement” in June, 2010 which was attended by many senior officers of PSUs.</li><li>• Conducted workshop on findings of the assignment “Identification of Industrial Sectors promising for commercialization of Solar Energy”.</li><li>• Conducted national level workshop on “Energy Efficient Procurement” in May, 2011 which was attended by many government officials.</li></ul> <p>In addition to this I also helped others in organizations of many workshops on energy efficiency.</p>
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I hereby state that information furnished above is true and correct to the best of my knowledge.

Place: Gurgaon

Signature:

Date: 28-06-2012

Name: Manoj Kumar Bansal  
Designation: Manager