

NPC Consultant Professional Profile

I. Personal Information

Name: P. Chitra
Date of Birth: 19.04.1976
Current Position & Domain: Director Gr-II, Energy Management
Office Location: Chennai
Languages: English, Tamil, Hindi and Kannadam

<i>Languages</i>	<i>Speak</i>	<i>Read</i>	<i>Write</i>
English	√	√	√
Tamil	√	√	√
Hindi	-	√	√
Kannadam	√	-	-



Contact: National Productivity Council,
Dr. Ambedkar Institute of Productivity,
(under DPIIT, Ministry of Commerce & Industry, GoI),
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Chennai – 600050.
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II. Professional Summary

- **Over 15 years of consultancy, training and auditing experience** in Energy Management, Renewable Energy, and Green Technologies & has assisted experience in the moderation, key setting activities in the conduct of BEE National Certification Examination for Energy Manager / Auditors and BEE Refresher Course Training, Assessment and Evaluation.
- **Carried out around 30 energy audit study** in different energy intensive industries viz., SME clusters, buildings & commercial establishments including BHEL (SSTP), Larsen & Toubro (L&T), RBI Buildings, Automobile cluster, Chlor-alkali sector, Dairy industry, HVF Ordnance board, Textile industry, Fertiliser Norms & Standards setting for specific energy consumption, Hindustan Unilever Ltd., Andrewyule Transformer Co., IMPCOPS, Rice mill, TNPCB buildings, IPL-ICRO Energy audits, SME & other sectors.
- **Carried out around 10 BEE PAT (Perform, Achieve & Trade) audit studies** viz., Monitoring & Verification (M&V) Audit, Mandatory Energy Audits, Base line Study for Designated Consumers especially in different Chlor-Alkali units
- **Coordinated and served as a Key Faculty by organising around 200 training programmes**, e-training, e-learning short term courses & webinars, ITEC & e-ITEC programs under Ministry of External Affairs, GoI, IRIEEN, Nasik, APO programs, ONGC, IOCL, GAIL, CPCL, Seshasayee Paper Board Ltd., ZETC (Railways), PCRA, Central Boiler Board, DPE – Govt. of Karnataka, NIT & other Engineering Colleges, Power grid, NTPC etc.) and different clusters like Textile, Dairy, General Engineering etc., Sponsored Training programmes by Bureau of Energy Efficiency (BEE) / World Bank / UNEP / UNIDO on Best Operating Practices for Energy Efficiency in different MSME Clusters

III. Areas of Expertise

Primary Domains: Energy Management – Thermal, Electrical, Mechanical Utilities and Renewable / Bio-Energy (Green Energy & Sustainability).

Specialized Skills: Conduct of Energy Efficiency Training Programs, Renewable & Green Energy Technologies, Energy Audit & Consultancy, Hands-on Practical Training on Energy Conservation, Inspection & Survey and BEE EM/EA NCE Examination duties.

Specialised Programmes organised:

- “Industrial Practitioner’s Course on Energy Efficiency in Industrial Utilities” for Energy Auditing Professionals
- “Resource Efficiency & Climate Change Mitigation through Energy Audit” - General Aspects of Energy Management & Audit
- “Energy Efficiency Practitioners Course for Industrial Utilities”
- “Technical Policy Instruments and Frameworks for Shifting to Renewable Energy”
- Technical Auditor Training for Oil & Gas Industry
- “Green Technologies for Sustainable Energy Systems”
- Hands-on Practical Training on Energy Efficiency and Conservation in Thermal & Electrical Utilities
- Best Operating Practices for Energy Efficiency in different MSME Clusters
- Assisted and Provided support in creation of Simulation based Digital twins (Virtual Reality) and Conduct of Simulation - based Training programs for MSME Industrial Clusters & Engineering students under GIZ project
- Assisted (Team member) in Manpower Optimisation study (of Sinter Plant division) at JSW Steel Plants, Salem, Tamil Nadu

Industry Focus: Commercial Buildings & Establishments, MSME Industrial Clusters, Auto-Component / Dairy / Textile Industries, Ordnance Factory Board, Chlor-Alkali and few other Designated Consumers & Industrial Sectors, etc.,

IV. Professional Experience

Current Position: Director Grade-II

Organisation: National Productivity Council, Chennai

Duration: 28.03.2023 till date

Key Responsibilities:

- Developing consultancy services in the field of energy management, conservation, renewable energy and green cleaner technologies for Sustainability
- Planning, designing and organizing training programmes, webinars and e-learning / e-trainings.
- Conducting need-based energy audits for industries, commercial buildings, designated consumers, etc.
- Preparation of course modules / study materials for training and reports for audits and assignments.
- BEE National Certification Examination related activities, Govt. related projects and assignments.

- Acting as Programme Coordinator / Team Leader / Core member for executing the project / training / consultancy assignments
- Promotional activities, carrying out preliminary survey & assessment, assessing the scope of project and proposal preparation, follow up with the client for materialisation of project.
- Creating awareness and marketing of all training programs and audits
- Initiating / developing business / training in new areas (Digi-Twins-VR tool, Sustainability, HR based Energy Management, Energy Transition towards Digital Revolution, Evolution of Hydrogen -A green Revolution) for revenue generation activities

Previous Position: Deputy Director

Organisation: National Productivity Council, Chennai

Duration: 07.09.2015 to 28.03.2023

Key Responsibilities:

- Developing consultancy services in the field of energy management, conservation, renewable energy, Green Technologies and sustainability
- Planning, designing and organizing national & international training programmes (Hands-on Practical Training on EE Programs), webinars and e-learning courses.
- Conducting need-based energy audits for industries, commercial buildings, designated consumers, MSME sectors etc.
- Co-ordinating in Renewable Energy (Solar, Wind & Biomass etc.) based training programmes, ITEC & e-ITEC international programmes
- Executing BEE PAT related work - monitoring & verification audits and mandatory energy audits for designated consumer industries
- Preparation of course/study materials for training and reports for audits and assignments.
- Creating awareness, promotional activities and marketing for all training programs and audits.
- BEE National Certification Examination related activities, and other Govt. related projects and assignments.

Previous Position: Assistant Director

Organisation: National Productivity Council, Chennai

Duration: 10.09.2008 to 06.09.2015

Key Responsibilities:

- Developing consultancy services in the field of energy management and renewable energy
- Planning, designing and organizing training programmes for national and international clients
- Conducting need-based energy audits for industries, commercial buildings, designated consumers, etc.
- Preparation of course/study materials for training and reports for audits and assignments.
- Creating awareness and marketing for all training programs and audits.
- BEE National Certification Examination related activities, and other Govt. related projects and assignments.

Previous Position: Senior Research Fellow

Organisation: Tamil Nadu Agricultural University (TNAU), Agrl. Engineering College & Research Institute, Coimbatore & Forest College & Research Institute, Mettupalayam.

Duration: 13/03/2006 – 29/02/2008 and 08/08/2005 – 21/01/2006

Key Responsibilities:

- Research activities in Bio-Energy based projects in ICAR fully funded adhoc scheme on “Techno economic feasibility of pilot study biodiesel plants in collaboration with NGO TNAU, Coimbatore” and ICAR Network Project on Tree Borne Oilseeds
- Course Associate / Coordinator for B.Tech Energy, Environmental & Food Processing Students.

Previous Position: Junior Research Fellow

Organisation: Tamil Nadu Agricultural University (TNAU), Agrl. Engineering College & Research Institute, Coimbatore

Duration: 30/06/2005 – 08/08/2005 and 16/04/2003 – 22/08/2003 and 27/02/2001 - 31/03/2003

Key Responsibilities:

- Research activities in Bio-Energy Dept., Zonal Research Centre, and Agricultural & Food Process Engineering Departments of TNAU in ICAR-AICRP on Farm Implements and Machinery scheme (Prototype Manufacturing Workshop), GOI scheme on “Development of natural draft gasifier for steam and hot air generation for turmeric boiling and drying”, and GOI scheme on “Development of dehydrated mushroom based extruded foods”

V. Major Project Experience in NPC:

Name	Role & Description	Period	Client	Nature of the project (Energy Audit / Consultancy & Recommendations)
BEE PAT cycle-2 Monitoring & Verification (M&V) Audit for Assessment year 2018-19	Team Leader cum Core Member	June & July 2019	1. Heavy Chemicals Division, Tamilnadu Petroproducts Ltd., Manali, Chennai. 2. The Andhra Sugars Ltd., Chemicals & Fertilisers Division, West Godavari (D.T.) AP	Verification & review of the Form-1 data during the Assessment Year 2018-19 and calculation of energy saving certificates achieved by the plant, report preparation & Form-B submission.
Mandatory Energy Audit	Core Team Member	November 2015	The Andhra Sugars Ltd., Chemicals & Fertilisers Division, West Godavari (D.T.) AP	Carried out Detailed Energy Audit of the plant. Field measurements, data collection from

				panels, historical data, from manuals etc. Analysis and identified scope for improvement in Specific Energy Consumption and prepared energy conservation proposals with Techno Economical Feasibility. Verified Form-1. Prepared Form-2 and Form-3.
BEE PAT cycle-1 M&V Audit for Assessment Year 2014-15	Team Leader cum Core Member	June 2015	The Andhra Sugars Ltd., Chemicals & Fertilisers Division, West Godavari (D.T.) AP	Verification & review of the Form-1 data during the Assessment Year 2014-15 and calculation of energy saving certificates achieved by the plant, report preparation & Form-B submission.
BEE Baseline Energy Audits for the units identified for the PAT Cycle-1	Core Team Member	June 2011 July 2011 November 2011 November 2011	1. HCD, Tamilnadu Petroproducts Ltd., Manali, Chennai. 2. Chemplast Sanmar Ltd., Plant-3 3. The Andhra Sugars Ltd., (Chemicals & Fertiliser Division), West Godavari, AP. 4. DCW (Chlor-Alkali) Sahupuram	Verification of the Form-1 data for the baseline year 2007-10 and calculated the baseline Gate- to Gate Specific Energy consumption of the units & base line report submission.
Energy Audit Study in different Industries, SME clusters, buildings & commercial establishments (Carried out about 30 energy audits)	Core Team Member	2008 – 2019, 2023	SME clusters, Automobile cluster, BHEL (SSTP), Dairy industries, HVF Ordnance board, Commercial Buildings (Larsen & Toubro (L&T), RBI, TNPCB Buildings etc.), IPL-ICRO energy audits (IMPCOPS, Rice mill cluster etc.), Textile industry, Fertiliser Norms & Standards setting for specific energy consumption, Hindustan	Conducted detailed energy audits, carried out the field level measurements with energy audit instruments, performance evaluation & assessment of core energy intensive equipment / utilities, identified energy conservation

			Unilever Ltd., Andrew Yule Transformer Co., Textile Industry, Chloralkali sector & other sectors.	opportunities with cost benefit analysis, report preparation, submission and presentation.
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VI. Educational Background

Degree	Year	Institution
M.E. (Bio-Energy)	2005	Tamil Nadu Agricultural University, Agricultural Engineering College & Research Institute, Coimbatore.
P.G.D.C.A.	2001	Fatima College, Madurai Kamaraj University, Madurai, Tamilnadu.
B.E. (Agrl. Engineering)	1998	Tamil Nadu Agricultural University, Agricultural Engineering College & Research Institute.
Accredited Energy Auditor (AEA 0140)	2013	Bureau of Energy Efficiency, Ministry of Power, Gol.
Certified Energy Auditor (EA 6888)	2009-10	(National Certificate Examination for Energy Managers / Auditors)
Certified Energy Manager	2007	
Renewed Certificate for Certified Energy Manager (on having attended Refresher Course during 22 nd -23 rd Dec. 2018)	March 2020	Bureau of Energy Efficiency, Ministry of Power, Gol.

Additional Professional Qualifications:

Trainings Undergone:

- Trainer of Training Program on Energy Efficient Equipment – Indo-Japanese Project – Regional Energy Efficiency Centre (REEC) on
 1. Pumps & Pumping System
 2. Combustion Furnace
 3. Steam trap & combustion dynamics
 4. Compressed Air Systems
 5. Fan System
- Attended theoretical training on Standalone Solar Power Supply Systems – 5 days (2015)
- Certification program on Certified Measurement and Verification Protocol (CMVP) (attended training)
- LEED- Associate Professional (attended training)
- LEED-Green Associate (attended training)
- ISO50001:2011 Energy Management Systems Lead Auditor Certification 2012.

- Attended APO workshop on Institutional strengthening through development of productivity and quality practitioners.
- Undergone one-month Practical exposure training on “Energy Management & Conservation” (2008) at National Small Industries Corporation Technical Service Centre, Chennai, Tamil Nadu.

Accreditations:

- Accredited Energy Auditor of India (AEA 0140)
- Certified Energy Auditor of India (EA 6888)
- ISO 50001:2011 EnMS Lead Auditor certification (2012).
- Refresher course certification for renewal of BEE – CEA certification.

Other Accomplishments:

- Life Member in Indian Society of Agricultural Engineering & Valarum Velanmai, TNAU

VII. Research and Publications

- **Principal Co-author of BEE Guide books** for ‘**National Certification Examination for Energy Managers and Energy Auditors**’ (2010 & 2015), Govt. of India.
- **Developed the course modules** for ‘Training of Trainers for Energy Managers / Auditors’ – for conduct of Energy Manager/Energy Auditor exam **for Sustainable Renewable Energy Development Agency (SREDA), Bangladesh** sponsored by Climate Technology Centre & Network (CTCN) (2018-19)
- Contributed in the preparation of guide book titled ‘**Energy Audit Manual - The Practitioner’s Guide**’ for Energy Management Centre (EMC), Trivandrum, Kerala (2017)
- Contributed in the preparation of **BEE ‘Refresher Course – Guide Book**’ for training, assessment & renewal of Energy Auditors / Managers certificate (2018)
- Involved (team member) in the **Preparation of Draft Report on ‘Best Practices Manual for GHG Emissions Reduction in Chlor-Alkali sector**’ for Bureau of Energy Efficiency, Govt. of India
- Publication of research articles / seminar papers: International – 1 no. and National Journal – 4 nos. on Biomass / biofuels related thesis work and Agricultural food processing related research activities.
 - Optimisation of experimental conditions for biodiesel production from alkali-catalysed transesterification of *Jatropha curcus* oil - Energy for Sustainable Development (2005) – Elsevier publications by P. Chitra et al (www.sciencedirect.com)
 - Effect of Slice Thickness, Pre-Treatments and Drying Methods on Drying Characteristics of Milky Mushroom (*Calocybe indica*) by R. Visvanathan^{1*}, P. Chitra² and S. Bhavani³ – Journal of Agricultural Engineering, Vol. 58, No.4, Oct. – Dec. 2021, pg. 343 – 351 (www.isae.in)

¹ Former Professor, Department of Food and Agri. Process Engineering, Tamil Nadu Agri. University, Coimbatore - 641 003, India. ² Deputy Director (Energy Management), National Productivity Council, Chennai – 600 050, India. ³ Consulting Nutritionist, Vallanadu, Thoothukudi, Tamil Nadu - 628252, India.

- Selective Parameter variables for biodiesel production from catalysed transesterification of *Jatropha curcus* oil, by P. Chitra et al, The Madras Agricultural Journal, TNAU, Vol. 92(7-9), July-Sept. 2005, pg. 523 – 525
- Characterisation and Purification of Crude Glycerol recovered from Transesterification of *Jatropha curcus* oil, by P. Chitra et al, The Madras Agricultural Journal, TNAU, Vol. 92(4-6), April-June. 2005, pg. 241-243.
- Biofuel and Value-added products from *Jatropha curcus* , P. Chitra et al, Renewable Energy, Akshay Urja, Vol-1, Issue 4, July-Aug.2005, Pg. 26-27, Ministry of Non-Conventional Energy Sources, GoI, (now MNRE)

Speaking Engagements:

- Participated & **presented country paper in APO Workshop on Advanced Renewable Energy Technologies and Assessing their Adoption and Application** (14 – 18 May 2016, Tehran, Islamic Republic of Iran)
- Attended APO (Asian Productivity Organisation) Forum on Sustainable Production of Biofuels at Manila, Philippines and **presented country paper on “Biodiesel Production Technology”** 26-28, November 2008.
- **Speaker on the topic: “Energy Independency, Challenges and Way Forward for Solar Start-ups”** in the panel discussion for Challenges Before the Next-Generation Solar Start-ups (Organised by Solar Energy Society of India (SESI) in partnership with Agnii & NPC) (2019-2020)

Awards and Recognition

- Recipient of National Renewable Energy Merit Fellowship by Ministry of New and Renewable Energy Sources during my post graduate study (2003 – 2005)

Certification:

I, the undersigned, certify that to the best of my knowledge and belief, this CV correctly describes myself, my qualifications, and my experience. I understand that I shall be responsible for any willful misstatement described herein.

Date: 07.02.2025

Place: Chennai

[Signature of Employee]

[P. Chitra]