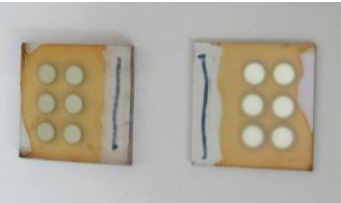


## Review Meeting Progress report of the Centre of Excellence (TEQIP-II)

Name of the CoE Member: \_\_\_\_\_

### I. Progress in the top 5 deliverables

No.	<u>Deliverable planned Items</u>	<u>Actual achievement</u>
1	Number of Publications	22 (09 Journals+ 13Confernces) Since 2012 Aug 4 Journals + 3 conferences 14 (Int Journals) 17 (int. conf ) 3 (Nat. conf) 06
2	Number of Patents sanctioned	
3	Number of Patents applied	1 01
4	Number of Products/Models developed	Prototypes developed for all PhD & M.Tech Project works completed listed
5	Number of Faculty Development Programmes conducted	02 03
6	Any other(specify)	<p>Basic Trials of Inverted Polymer Solar Cell were made An efficiency of 0.6 % has been achieved.</p>  <p>Value is for prototype device, several parameters are yet to be optimized to improve efficiency.</p> <p>Ultra Thin Silver Films were deposited as an alternate to transparent Conducting Electrode for use as a buffer layer in solar cells to improve light harvesting capability.</p> <p>A maximum transmittance of 30% to 50% was observed in the visible region.</p> <p>The conductivity of the electrodes was in the range <math>2.133 \times 10^{-1} (\Omega \text{ cm})^{-1}</math>.</p>

### II. Publications related to the Thematic areas of the CoE (since the inception of the COE from 2013-14)

#### A. International Journal Publications

Title	Author(s)	Name of the Journal	Date of publication	Remarks (Scopus/Web of Science and Impact Factor)
Facile sonochemical synthesis of BiOBr-graphene oxide nanocomposite with enhanced photocatalytic activity for the degradation of Direct green	Sandip P. Patil, Rahul P. Patil, Vilas K. Mahajan, G. H. Sonawane, V. S. Shrivastava, Shirish Sonawane	Materials Science in Semiconductor Processing	18 May 2016	IF:2.264

Synthesis of ultra-small platinum nanoparticles in a continuous flow microreactor	Prashant L. Suryawanshi, Sarang P. Gumfekar, P. Rajesh Kumar, Bharat B. Kale, Shirish H. Sonawane	Colloid and Interface Science Communications	10 May 2016	SNIP: 0.707
Synthesis of palladium nanoparticles using continuous flow microreactor	S. Sharada, Prashant L. Suryawanshi, Rajesh Kumar P., Sarang P. Gumfekar, T. Bala Narsaiaha, Shirish H. Sonawane	Colloids and Surfaces A: Physicochem. Eng	27 March 2016	IF: 2.76
Effect of Process Parameters on Properties of Colloids in a Continuous-Flow Microreactor System	Shirish H. Sonawane, Mahendra L. Bari, Prashant L. Suryawanshi, Jitendra S. Narkhede, Satyendra Mishra, B.A. Bhanvase	Chemical Engineering & Technology	14 Sept 2015	IF: 2.385
Sonoprocessing of Nano-Sized $\text{LiFePO}_4$ and nanocomposite for cathode material for Lithium Ion Batteries	L. I. Bhagawat, Dipak Pinjari, Bharat A Bhanvase V. S. Patil, B. B. Kale, S. H. Sonawane, M. Ashokkumar	Polymer Composites	30 January 2015	IF: 2.004
Process Intensification of Uniform Loading of $\text{SnO}_2$ Nanoparticles on Graphene Oxide Nanosheets using a Novel Ultrasound Assisted In-Situ Chemical Precipitation Method	M. P. Deosarkar, S. M. Pawar, S. H. Sonawane, B. A. Bhanvase	Chemical Engineering and Processing: Process Intensification	2013	IF: 2.154
Review on challenges of direct liquid fuel cells for portable application	Venkateswarlu Velisala, <b>G. Naga Srinivasulu</b> , B. Srinivasa Reddy and K. Venkata Koteswara Rao	WORLD JOURNAL OF ENGINEERING (MULTI-SCIENCE PUBLISHING COMPANY LTD.)	29 September 2015	Scopus
<i>Single-Stage Electrolytic Capacitor less Non-Inverting Buck-Boost PFC Based AC-DC Ripple Free LED Driver</i>	<i>Ramanjaneya Reddy U, Narasimharaju B.L</i>	<i>IET Power Electronics</i>	<i>Sept 2016 (Early Access) <a href="http://dx.doi.org/10.1049/iet-pel.2015.094">http://dx.doi.org/10.1049/iet-pel.2015.094</a></i>	<i>SCI, <a href="#">Impact factor: 1.683</a></i>

			<u>5</u>	
Improved Efficiency Coupled Inductor-Buck AC-DC Light Emitting Diode (LED) Driver	Ramanjaneya Reddy U, Narasimharaju B.L	IEICE Electronics Express (ELEX)	August 2016, <a href="http://doi.org/10.1587/eleex.13.20160626">http://doi.org/10.1587/eleex.13.20160626</a>	SCI, Impact factor: 0.41
Performance Evaluation of Switched Reluctance Motor PWM Control in PV-fed Water Pump System "	Vijay Babu K, Narasimharaju. B.L, D. M. Vinod Kumar,	Journal of Renewable Energy Research (IJRER)	June 2016, <a href="http://www.ijrer.org/ijrer/index.php/ijrer/article/view/4004/pdf">http://www.ijrer.org/ijrer/index.php/ijrer/article/view/4004/pdf</a>	Scopus, EBSCO, Web of Science, Impact factor: 0.898
Switched Reluctance Machine for Off-Grid Rural Applications: A Review	Vijay Babu K, Narasimharaju. B.L, D. M. Vinod Kumar	Taylor & Francis- IETE Technical Review	Dec2015, <a href="https://doi.org/10.1080/02564602.2015.1117400">doi/abs/10.1080/02564602.2015.1117400</a>	SCI, Impact factor:1.30
Space-vector pulse width modulation scheme for open-end winding induction motor drive configuration	Srinivasan P, Narasimharaju. B.L, Srikanth N. V	IET Power Electronics	July 22015, <a href="http://dx.doi.org/10.1049/iet-pel.2014.0396">http://dx.doi.org/10.1049/iet-pel.2014.0396</a>	SCI, Impact factor: 1.683
A new alternate Fixed-bias inverter SVPWM scheme for open-end winding induction motor drive	Srinivasan P, Narasimharaju. B.L, Srikanth N. V	International Review of Electrical Engineering	Feb 2014,	Scopus, Impact factor: 0.57
Investigation of Device Temperature on Power Electronics Switches used in open-end winding induction motor drive for Alternate fixed-bias inverter scheme	Srinivasan P, Narasimharaju. B.L, Srikanth N. V	International Review of Electrical Engineering	Feb 2014,	Scopus, Impact factor: 0.57
Design and Analysis of Coupled Inductor Bidirectional DC-DC Converter for High Voltage Diversity Applications	Narasimharaju B. L, S. P. Dubey, S.P.Singh	IET Power Electronics	Aug 2012, <a href="http://dx.doi.org/10.1049/iet-pel.2011.0141">http://dx.doi.org/10.1049/iet-pel.2011.0141</a>	SCI, Impact factor: 1.683
Effect of Fuel Injection Pressure and Spray Cone Angle in DI Diesel Engine Using CONVERGE TM CFD Code	GP Rao, VRKRaju, SS Rao	Procedia Engineering	(2015)	SCOPUS
Investigating optimal operating parameters of DI diesel engine: a CFD	GanjiPrabhakara Rao, VipinDhyani, Deepak Kumar,	World Journal of Engineering	2016	SCOPUS

approach using CONVERGETM	V.R.K. Raju , S. Srinivasa Rao			
Parametric Optimization Through Numerical Simulation of VCR Diesel Engine	G. PrabhakaraRao, Abdulrahman Shakir Mahmood, Aasrith K, V R K Raju, and S Srinivasa Rao.	<i>Journal of The Institution of Engineers (India): Series C</i>	2016	<u>Springer Publication</u>
Parametric study and optimization using RSM of DI diesel engine for lower emissions	Ganji, PrabhakaraRao, Kiran Prasad Chintala, VR K. Raju, and Srinivasa Rao S	<i>Journal of the Brazilian Society of Mechanical Sciences and Engineering</i>	2016	<u>SCI (0.963 impact factor)</u>
Numerical investigation of particle deposition inside aeroshielded solar cyclone reactor: A promising solution for reactor clogging	<b>D. Jaya Krishna</b> and Nesrin Ozalp	<i>International Journal of Heat and Fluid Flow</i>	2013, Vol. 40, pp: 198-209	SCI (IF: 2.112)
Differential Scanning Calorimetry (DSC) Analysis of Latent Heat Storage Materials for Low Temperature (40-80°C) Solar Heating Applications", <i>International Journal of Engineering Research and Technology</i>	R. Sanjay Kumar and <b>D. Jaya Krishna</b>	<i>International Journal of Engineering Research and Technology</i>	2013, Vol. 2(8), pp: 429-455	--
Investigation of heat storage materials for temperature range of 50°C to 100°C",	R Sanjay Kumar, <b>D Jayakrishna</b> and Pramod B Salunkhe	International Journal of Conceptions on Mechanical and Civil Engineering-WJP	2013 Vol. 1(1), pp: 53-57 (ISSN: 2357 - 2760 (Online) and 2357 - 2752 (Print))	---
Peclet Number Analysis of Cross-flow in Porous Gas Diffusion Layer of Polymer Electrolyte Membrane Fuel Cell (PEMFC)	<b>P V Suresh,</b> S Jayanti	Environmental Science and Pollution Research	2016 DOI 10.1007/s11356-016-6629-x.	SCI IF: 2.828
Detailed analysis of integrated steam ethanol reformer and high temperature polymer electrolyte membrane fuel cell	Dhanya George <b>P V Suresh</b>	International Journal of Hydrogen Energy	41 (2016), 1248-1258	SCI IF: 3.313

### B. National Journal Publications

Title	Author(s)	Name of the Journal	Date of publication	Remarks (Scopus/Web of Science and Impact Factor)
Numerical solution and it's analysis during solar drying of green peas	Arunsandeep G., Abhay Lingayat, Razatkumar Naik, Chandramohan V.P., V.R.K. Raju	Journal of The Institution of Engineers (India): Series C, Springer	Communicated on Jan 2016, Review received on Feb 2016.	SCOPUS, Springer publication
Inverted Polymer Solar Cell using 'Ta' doped V <sub>2</sub> O <sub>5</sub> Thin Film as Cathodic Buffer Layer	M. Kovendhan, D. Paul Joseph, K. Sowri Babu, A. Sendilkumar	If accepted will be published in American Institute of Physics – Conference Proceedings	<u>Submitted</u> to forth coming DAE SSPS-2016 From Dec. 26-30, 2016 at KIIT-Odisha	Scopus indexed
Space-vector Based Equal Switching Strategy for Three-level Open-end Winding Induction Motor Drive	Srinivasan P, <b>Narasimharaju.B.L</b> , N.V. Srikanth, Deshpande R A	The Journal of CPRI	June 2014	CPRI, Bangalore India

### C. International Conference Publications

Title	Author(s)	Name of the Journal	Date of publication	Remarks (Scopus/Web of Science and Impact Factor)
Functional polymer and nano-catalysts for the PEM Fuel cell application	S. H. Sonawane, P. L. Suryawanshi, P. Rajesh Kumar and B. B. Kale	65th Canadian Chemical Engineering Conference (CSCHE2015)	4 <sup>th</sup> -7 <sup>th</sup> October, 2015	
Synthesis of Graphene Oxide and Graphene Oxide (GO) Loaded With Palladium Nanoparticles as a Catalyst for PEM Fuel Cell Applications	Shirish H. Sonawane, Prashant L. Suryawanshi, Bharat B Kale	WCSM- 2015 Conference Korea	23 <sup>rd</sup> -25 <sup>th</sup> March, 2015	
Studies on Process	Bhivgade UV,	International	20 <sup>th</sup> -22 <sup>nd</sup> Dec,	

Parameters of Continuous Production of Nickel Nanoparticles Using Spiral Microreactor	Sonawane SH	Conference on Advances in Chemical Engineering, NITK Surathkal	2015	
Performance evaluation on compressor for a turbocharged engine	Pritam Kumar, D. Ravichandra, Chandramohan V.P., Ravi Kumar Puli,	Proceedings of ICAME-2015, UCEV, Villupuram, Tamil Nadu	15 <sup>th</sup> & 16 <sup>th</sup> of October 2015	----
2D numerical analysis of heat and mass transfer during drying of rectangular brick	Ashwani Upadhyay, Gautam Kumar Arya, V.P. Chandramohan	5 <sup>th</sup> International and 41 <sup>th</sup> National Conference on Fluid Mechanics and Fluid Power – FMFP 2014	Dec 12-14, 2014, IIT Kanpur.	----
Review on Design and Performance of Indirect Type Solar Driers	Abhay Lingayat, Arunsandeep G., Chandramohan V.P., V.R.K.Raju,	Proceedings of 2 <sup>nd</sup> International Conference on Thermal, Energy and Environment, INCOTEE 2016,	25-26 <sup>th</sup> Mar, 2016, Kalasalingam University, India.	----
Numerical studies on optimal operating parameters of PEM fuel cells	Venkateswarlu Velisala, <b>G.Naga Srinivasulu</b> , Venkata Koteswara Rao K.	International Conference on Trends in Industrial and Mechanical Engineering (IC TIME 2016). Maulana Azad National Institute of Technology, Bhopal. (Published in Science & Technology Journals)	February 4-6, 2016 (1 July 2016)	---
Numerical simulation of parallel flow field configuration on PEM fuel cell performance <b>(communicated)</b>	Venkateswarlu Velisala, <b>G. Naga Srinivasulu</b>	Current research topics in Power Nuclear & Fuel Energy in associated with International Conference on Recent Trends in Engineering, Science and Technology (ICRTEST) - 2016	25th- 27th October 2016.	---

		organizing by St. peters engineering college, Hyderabad, India.		
Ultra-thin 'Ag' Films as an Alternative Transparent Conducting Electrodes	R. Veerababu, M. Kovendhan, R. Arockiakumar, D. Paul Joseph	Presented at the ICMST-2016, Kerala- held on 5 – 05 <sup>th</sup> to 08 <sup>th</sup> June 2016	-NIL-	Paper under preparation, to be submitted separately
Unity power factor Buck-Boost LED driver for wide range of input voltage application	Ramanjaneya Reddy U, Narasimharaju B. L	IEEE India Conf. INDICON-2015, JMI, Delhi, India	pp. 1 -5, 17 -20 December 2015	
Modeling and Analysis of Voltage Controlled Positive Output Synchronous buck-boost converter	Narasimharaju B. L, Goutham Bharna, Ramanjaneya Reddy U, Vijay Babu K	IEEE India Conf. INDICON-2015, JMI, Delhi, India	pp. 1 -5, 17 -20 December 2015	
Bidirectional AC-DC Converter and DC-DC Converter for Charge/Discharge Applications	Narasimharaju B. L, Divya. P, Ramanjaneya Reddy U, Vijay Babu K, S. P Dubey	Intl. Conf. Advanced Research Applications in Engineering , Technology , Science & Management, Shaastrarth 2015	29 <sup>th</sup> -30 <sup>th</sup> June 2015, pp.1-5.	
Five Level Inverter using POD PWM Technique	K.Karthik, Narasimharaju B. L, S. Srinivasa Rao	IEEE EESCO-2015 conference, Visakhapatnam, India	24-25th Janaury 2015., pp. --	
Enhanced Closed Loop Voltage Control of Buck Converter for Improved Performance	Narasimharaju B. L, Ramanjaneya Reddy U	IEEE India Conference INDICON-2014, Pune, India	pp. 1 -5, 11 -13 December 2014	
Optimized Dual Active Bridge Bi-Directional DC-DC Converter for UPS Application	Narasimharaju B. L, Venkata Prahlad V, Ramanjaneya Reddy U, Vijay Babu K, P. Srinivasan	Power Electronics, Drives and Energy Systems (PEDES-2014), Power India, IEEE-International Conference, IIT Bombay, India	pp. -, December 16 -19, 2014	
Two-quadrant Clamping Inverter Scheme for Three-level Open-end	Srinivasan Pradabane, B.L. Narasimharaju, N.	Power Electronics, Drives and	pp. -, December 16 -19, 2014	

<i>Winding Induction Motor Drive</i>	V. Srikanth	<i>Energy Systems (PEDES-2014), Power India, IEEE-International Conference, IIT Bombay, India</i>		
Design and small signal analysis of solar PV fed FPGA based Closed Loop control Bi-Directional DC-DC converter	Raveendhra, Dogga; Thakur, Padmanabh; <b>Narasi mha Raju, B.L</b>	<i>Circuits, Power and Computing Technologies (ICCPCT), 2013 International Conference on</i>	vol., no., pp.283,288, 20-21 March 2013	
Numerical investigation of the effect of compression ratio on the performance of direct injection diesel engine.	G.PrabhakaraRao, VipinDhyani, Deepak Kumar, V.R.K.Raju, S.S.Rao.	Proceedings of 5th international and 41st national conference on Fluid Mechanics and Fluid Power, IIT Kanpur 12th to 14th Dec 2014	12th to 14th Dec 2014	
Numerical investigation of split injection on pongamia bio diesel blend	G.PrabhakaraRao, Arun Raj, RudranathSingh,V. R.K.Raju, S.S.Rao	Proceedings of 2 <sup>nd</sup> International Conference on Thermal, Energy and Environment	March 25&26, 2016.	
The Metallographic Study of Corrosion of Metals with Latent Heat Storage Materials Suitable for Solar Hot Water System	<b>D. Jaya Krishna</b> and Sharabh Kochar	International Conference on Ceramic and Advanced materials for Energy and environment, Christ University, Bengaluru, India,	14 <sup>th</sup> -17 <sup>th</sup> Dec., 2015	---
Step by Step Methodology for the Assessment of Metal Corrosion Rate with PCMs Suitable for Low Temperature Heat Storage Applications : 2-IC-1865	<b>D. Jaya Krishna</b> and Aditya Shide	International conference on recent Trends in Engineering and material Sciences (ICEMS-2016), Jaipur National University, Jaipur, Rajasthan, India,	17 <sup>th</sup> - 19 <sup>th</sup> march, 2016.	---
Analytical and Numerical Study to Assess the	Manish Kumar and <b>D. Jaya Krishna</b>	International Conference on	7 <sup>th</sup> - 8 <sup>th</sup> April, 2016.	---



Solar Flux on a Heliostat based Central Receiver-MODD-027		Energy efficient Technologies for sustainability (ICEETS-16), St.Xaviers catholic College of Engineering, Nagercoil, Tamil Nadu, India,		
Integration of Steam - Ethanol Reformer with High Temperature Polymer Electrolyte Membrane Fuel cell	Dhanya George, P V Suresh	International Conference on Chemical, Civil and Environmental Engineering (ICCCCE'2015)	London, UK, Mar 23-24, 2015	
Review on Catalysts for High Temperature PEM Fuel Cell	Divya Priya A, P V Suresh	International conference on New Frontiers in Chemical, Energy and Environmental Engineering (INCEEE-2015)	NIT Warangal, Mar 20-21, 2015	
Combined system of ethanol reforming process with PEMFC for low temperature and high temperature process	Dhanya George, P V Suresh	International conference on New Frontiers in Chemical, Energy and Environmental Engineering (INCEEE-2015)	NIT Warangal, Mar 20-21, 2015	

#### D. National Conference Publications

Title	Author(s)	Name of the Journal	Date of publication	Remarks (Scopus/Web of Science and Impact Factor)
Preparation of Carbon-Supported Pt-Co Nano catalysts by Sonochemical Approach for PEM Fuel Cells	P Rajesh Kumar, Prashant L Suryawanshi, Shirish H Sonawane	Chemcon-2015, IIT Guwahati	Dec 28 <sup>th</sup> - 30 <sup>th</sup> , 2015	
High temperature PBI membrane for fuel cell application	Prashant L Suryawanshi, P Rajesh Kumar, Shirish H Sonawane	Chemcon-2015, IIT Guwahati	Dec 28 <sup>th</sup> - 30 <sup>th</sup> , 2015	
Synthesis of Palladium	Prashant L.	National	January 12 <sup>th</sup> &	

Nanoparticles as a Catalyst for PEM Fuel Cell Applications	Suryawanshi, Uday Bagale, Shirish H. Sonawane	Conference on Chemistry of Chalcogens (NC3-2015), DIAT Pune	13 <sup>th</sup> , 2015	
Computational fluid dynamics study of parallel flow field proton exchange membrane (PEM) fuel cell performance <b>(Accepted)</b>	Venkateswarlu Velisala, <b>G. Naga Srinivasulu</b> , and Vivek Tiwari	National Symposium of Mechanical Engineering Research Scholars" Organised by Department of Mechanical Engineering, NIT Warangal, 7 <sup>th</sup> October 2016.	7 <sup>th</sup> October 2016	
<i>Optimization of Ultra-thin 'Ag' Films as an Alternative Transparent Conducting Electrodes</i>	R. Veerababu, M. Kovendhan, R. Arockiakumar, D. Paul Joseph	Presented at the NCAMPC-NITW-MME Dept.-4 to 6th Jan 2016	-NIL-	Appeared only in the conference proceedings
Thermal Evaporation of 'Sn' metal layer over V <sub>2</sub> O <sub>5</sub> thin Film and its Characterization	M. Kovendhan, K. Sowri Babu, D. Paul Joseph	Presented at FCST, 28 <sup>th</sup> – 29 <sup>th</sup> Jan. 2016, Dept. of Chemistry, NIT-W	-NIL-	Appeared only in the conference proceedings
ANN Assisted Angle Control for SRM Based PV Water Pumping System	Vijay Babu K, <b>Narasimharaju B. L</b> and Vinod Kumar D M	Proc. <i>National Conference AECT-2016, MIT Manipal, India</i>	pp. -, 28 <sup>th</sup> - 30 <sup>th</sup> January 2016	
Modulation Index based Application Selectivity of Dual Source-Fed Open-end Winding Induction Motor Drive	<b>Narasimharaju B. L</b> , Shaik Rafi, Vijay Babu K, <i>Ramanjaneya Reddy U</i>	Proc. <i>National Conference AECT-2016, MIT Manipal, India</i>	pp. -, 28 <sup>th</sup> - 30 <sup>th</sup> January 2016	
Performance Analysis of Single H-Bridge Multi-Level Inverter	Karthik .K, Ramanjaneya Reddy U, <b>Narsimharaju B. L</b> , Srinivasa Rao S	Proc. <i>National Conference AECT-2015, MIT Manipal, India</i>	pp. -, 23rd - 24th January 2015	
Hysteresis controlled power factor correction boost converter for LED lamp Load	Ramanjaneya Reddy U, <b>Narsimharaju B. L</b> , Vijay Babu K	Proc. <i>National Conference AECT-2015, MIT Manipal, India</i>	pp. -, 23rd - 24th January 2015	
Nonlinear Loads and Harmonics Role in Power Quality Issues	<b>Narasimharaju B. L</b>	Proc. <i>National Conference AECT-2013, MIT Manipal, India</i>	pp. 1-6, 7 <sup>th</sup> - 9 <sup>th</sup> February 2013	
Numerical Experiment of CI Engine Combustion Using CONVERGE	VipinDhyani, Deepak Kumar, PrabhakarRao, V.	Proceedings of National Conference On	11-12th March 2014.	

Software	R. K. Raju, S. S. Rao.	Fire Research and Engineering. FIRE 2014, IIT Roorkee.		
Process optimization of catalyst ink preparation for High Temperature Proton Exchange Membrane (HTPEM) Fuel cells	P V Suresh, Khedkar Amit, Vasu Gollangi	CHEMCON 2013	ICT Mumbai, Dec 27-30, 2013	

### III. PhD scholars attached to the CoE/working in the Thematic areas of the CoE

Names of PhD scholars enrolled	Year of enrolment	Remarks (broad Topic of Research)
Prashanth L Suryawanshi	Dec, 2014	Noble and Non Noble Metal production and Applications in Fuel Cell
P. Rajesh Kumar	Aug, 2015	Development of catalyst and membrane system for fuel cell
Pandiri. Narasimha	Aug, 2016	Nanocatalyst for Solar cells
Divi Srinivas	Dec 2015	Process control of Fuel Cell
ABHAY B.LINGAYAT, Res Scholar, Roll no: 715031	July 2015	Solar drying of agricultural products
RAMAKRISHNA, Roll.No.716134	July 2016	Solar updraft tower power plant
Venkateswarlu Velisala	December 2013	PEM fuel cells for low power applications
K. Venkata Koteswara Rao	July 2014	PEM fuel cell hybrid vehicles
B.Srinivasa Reddy	December 2014	Thermal management of PEM fuel cells
B. Murali Krishna	July 2015	DMFC for low power applications
Ganesh Gawale	July 2016	Internal Combustion Engines
V K Satyakar Veeramalla	July 2016	<u>Under CoE,</u> PV fed DC-DC Conversion (tentative) <u>Ongoing.</u>
Ramanjaneya Reddy U (Roll No. 701409)	Dec 2013	Institute Scholarship, <u>working in the Thematic areas of the CoE,</u> An Improved LED Driver Circuits (tentative) <u>Ongoing,</u>
Vijay Babu K, (Roll No.701341)	July 2013	Institute Scholarship, <u>working</u>

		in the Thematic areas of the CoE, SRM based Hybrid Energy System (tentative) <b>Ongoing</b>
Prabhakara Rao Ganji	2013	Numerical and Experimental analysis of HCCI combustion for biofuel blends
G. Uma Maheswararao	July, 2014	Latent heat storage materials for low temperature heat storage applications
Abdulla Sheikh	2015	Studies on PEM Fuel Cells

IV. M.Tech. / MSc students completed / working in the Thematic areas of the CoE

Names of the student	Year of enrolment	Specialization	Remarks (Title of the Dissertation/ broad Topic of work)
Urvashi Bhivgade	2014		Microreactor based preparation of nanoparticles
Abhijeet Kulkarni	2013		Microreactor based process intensification for nanoparticles production
Urvashi Bhivgade	2014		Microreactor based preparation of nanoparticles
ARUN SANDEP, MTech Scholar, Roll no: 143602	JULY 2014	THERMAL ENGG	Numerical and experimental analysis on drying of food products using solar dryer
Sushil Kumar	2015	M.Tech (Automobile Engg.)	Design and optimization of flow field of bipolar plate of proton exchange membrane fuel cell
Telangji Ajay Devidas	2014	M.Tech (Automobile Engg.)	Analysis and Optimization of Fuel Cell Hybrid Powertrain
ROHIT KUMAR	2014	M.Tech (Automobile Engg.)	Numerical Simulation of VCR engine combustion for low Temperature combustion
Ibrahim Mustefa	2013	M.Tech (Automobile	Energy and exergy analysis

Mohammed		Engg.)	of proton exchange membrane fuel cell
R. Veera Babu Roll No.145516	2015-2016	Materials Technology-MMED	Ultra-thin 'Ag' Films as an Alternative Transparent Conducting Electrodes
Surya Prakash Rao	2016-2017	Materials Technology-MMED	Deposition of thin metallic alloy films
Surasani Avinash	July 2014	Power Electronics & Drives	Capacitance Reduction with An Optimized Converter Connection Applied to LED Drivers
V.Harish,	July 2014		Switched Reluctance Motor Control Strategies for Quadratic load Application – A Comparative Study
G. Mani Kiran Kumar	July 2013		A Flicker free Electrolytic Capacitor-less AC-DC LED Driver
Harish S	July 2013		Design and Analysis of Isolated AC-DC Converter
VipinDhyani (Roll No. 123621)	2012	<u>Thermal Engineering</u>	Optimization of Operating Parameters through Simulation of CI Engine Working in HCCI Mode Using CONVERGE Software
Deepak Kumar (Roll No. 123705)	2012	<u>Automobile Engineering</u>	Numerical Simulation of Direct Injection Compression Ignition Diesel Engine Operating on HCCI Mode using CONVERGE
ABDULRAHMAN SHAKIR MAHMOOD & Roll No. 133601	2013	<u>Thermal Engineering</u>	Parametric Optimization Through Numerical Simulation of DI Diesel Engine To Achieve HCCI Combustion
Rohit Kumar & Roll No. 133715	2013	<u>Automobile Engineering</u>	Numerical Simulation of VCR Engine Combustion Chamber for Low Temperature Combustion
ChintalaKiran Prasad & Roll No. 133703	2013	<u>Automobile Engineering</u>	Numerical Simulation of CI Engine to Achieve HCCI Mode of Operation
RudraNath Singh (Roll No. 143715)	2014	<u>Automobile Engineering</u>	Design of optimal piston bowl geometry for better combustion in direct injection compression ignition engine
KummaraViswanath (Roll No. 143710)	2014	<u>Automobile Engineering</u>	Effect of operating parameters on performance and emission characteristics

			of VCR engine
Arun Raj S.R (Roll No. 143704)	2014	<u>Automobile Engineering</u>	Improving the emission standards of a CI engine using In-cylinder techniques
Mathura Kumar	2015	<u>Thermal Engineering</u>	<u>Influence of Mushy zone constant on thermohydraulics of a PCM</u>
Amit Khedkar	2012-14	<u>M.Tech. in Chemical Engineering with Specialization in Computer Aided Process and Equipment Design</u>	<u>Experimental and Modeling studies on Polymer Electrolyte Membrane Fuel Cell</u>
Dhanya George	2013-15	<u>M.Tech. in Chemical Engineering with Specialization in Computer Aided Process and Equipment Design</u>	<u>Analysis of integrated steam ethanol reformer &amp; Polymer Electrolyte Membrane Fuel cell</u>
Disha K Jain	2015-17	<u>M.Tech. in Chemical Engineering</u>	<u>Studies on humidification system for PEM Fuel Cell stack (on-going)</u>

V. B.Tech. students completed / working in the Thematic areas of the CoE

Names of the student	Year of enrolment	Specialization	Remarks (Title of the Project / broad Topic of work)
Ayush Tyagi) Kunal Kumar Tanuj Yadav) Ayan Mukhopadhyay	2013	B.Tech Mechanical Engg.	Thermal and Economical Analysis Of PEM Fuel Cell
Ankit Tayal, (R.No: 122204 ) G. Swamy, (R.No: 122216)	2012-13	<u>Electrical &amp; Electronics Engineering</u>	Speed Control of Voltage Source Inverter (VSI) fed Induction Motor Drive
Sneha N , (R.No: 122133) Priyanka Gupt, (R.No: 122140) T. Spandana, (R.No: 102171)	2010-11	<u>Electrical &amp; Electronics Engineering</u>	GSM based Automated Energy Metering
Mr. Anurag Das, (R.No: 102106) Mr.G.NaveenKumar, (R.No: 1021117) Mr. P Abhimanyu, (R.No: 102137)	2010-11	<u>Electrical &amp; Electronics Engineering</u>	High Gain soft-switched Bidirectional DC-DC converter for Eco-friendly vehicles
Aasrith K & Roll No.UG113201	2011	<u>Mechanical</u>	VCR engine modelling and performance evaluation on emissions
AbhishekBadwal(123102)	2012	<u>Mechanical</u>	Achieving HCCI combustion by parameter

			Optimization
Prashant Kumar Singh	2011	Mechanical Engg	A Novel Bi-Axial Solar Tracking System

#### VI. Teaching/Research Assistantship

Names of the candidate	Date of Joining	Qualifications	Area of Research and its outcome
Vivek Tiwari	July 2016	M.Tech (Energy Engg.)	Experimental studies on PEM fuel cell performance
R. Tejaswi		M.Tech	Design and Analysis of Integrated AC-DC converter
K Janaki		M.Tech	Design and Analysis of DC-DC converter
Vijaya Vardhan P		M.Tech	Design of 2-DOF Controlled Boost Converter in CCM using Characteristic Ratio Assignment
Karthik .K		M.Tech	Performance Analysis of Single H-Bridge Multi-Level Inverter

#### VII. List of Equipment/Software Procured

Name of the equipment	Date of Purchase	Amount	Utility for Class Work (B.Tech./M.Tech.)	Research Work (B.Tech./M.Tech./M.Sc./Ph.D.)	Consultancy work
Low Temperature PEM single Fuel Cell (25 cm <sup>2</sup> )	09.08.2014	84,242/-	No	Ph.D	
Low Temperature PEM single Fuel Cell (100 cm <sup>2</sup> )	09.11.2015	84,667/-	No	Ph.D	
Low Temperature PEM single Fuel Cell (300 cm <sup>2</sup> )	16.11.2015	1,30,013/-	No	Ph.D	
High Temperature PEM single Fuel Cell (25 cm <sup>2</sup> )	21.10.2015	6,23,807/-	No	Ph.D	
PEM Fuel Cell Stack (100 cm <sup>2</sup> )	21.10.2015	6,50,185/-	No	Ph.D	
PEM Fuel Cell Work Station	23.09.2014	2,58,750/-	No	Ph.D	
Multifunction instrument model 435-2, 2 Nos	28.01.2016	2.49 Lakhs	Nil	Used for estimating air velocity, humidity and temperature during drying	Nil
2.Three function	28.01.2016				

probe – 2 Nos				experiments for M.Tech and Ph.D projects	
Programmable PEM fuel cell test station	2014	36,00,000	M.Tech	M.Tech and Ph.D	---
PEM fuel cell 50-100 Watt capacity Hardware	2016	9,19,783	---	Ph.D	---
Thermal Evaporation With chiller unit	May 2014	3.99605 Lakhs	Used for Demonstration of Diffusion Vacuum pump, Physical Vapour Deposition for 2 <sup>nd</sup> B. Tech – MMED students as a part of their theory paper “Electronic and Magnetic Materials”.	To deposit thin films for M. Tech Project Work	-NIL-
4 Channel Isolated Digital Storage Oscilloscope	25.01.2016	3,20,250/-	The items are using for research work , Center of Excellence for Sustainable Energy studies”	All the items procured are utilizing effectively for research work	
DC-DC Chopper + IGBT based Inverter Modules with Control cards	23.02.2016	1,68,800/-			
Programmable Electronic Load. (AC+DC), 5.4kW	08.07.2016	10,89,270/-			
Current Probes AC/DC, 2 nos	26.02.2016	1,17,180/-			
10 kW Programmable DC Power supply with Solar Array Simulation	08.07.2016	7,38,525/-			
Variable Compression Engine Test Rig  (With AVL 444 gas analyzer)	<u>March 2014</u>	18,41,250/-	<u>M.Tech</u>	To conduct the experiments by varying compression ratio and fuel injection timing for various fuels such as diesel and biodiesel blends <u>M.Tech and Ph.D.</u>	
SMOKE METER	Feb 2016	Rs.1,78,925 .00	M.Tech and Ph.D.	TO measure the smoke emissions from the exhaust	
CONVERGE	May	5,07,875/-	M.Tech	2 Phd and 2	



software	2016			M.Tech are working on the CONVERGE™ simulation analyses	
Work stations (02)	June 2014	7,10,000/-	Ph.D.	To do numerical simulations by varying operating parameters such as compression ratio, fuel injection timing, EGR, fuel injection pressure etc.	
MODE FRONTIER software	May 2016	15,000/-	Phd/ M.Tech	To perform DOE analyses for optimization	
UPS		1,59,000/-	<u>NA</u>	For the uninterrupted power supply for workstations to perform simulations	
Thermal stability of Phase change materials Set-up	22.01.2016	4,12,500/-		B.Tech./M.Tech./ Ph.D.	<u>NIL</u>
Gas distribution system for H2/O2/N2 and Air	2015-16	8,85,434 /-	M.Tech.	M.Tech & Ph.D	Yes
Gas Cylinders for H2/O2/N2 and Zero air	2016-17	1.,70,520 /-	M.Tech.	M.Tech & Ph.D	Yes

### VIII. Collaborative R&D Activities

#### A. With other Institutions

Name of the Institution	Broad Area of Collaboration	Joint Projects	Joint Ph.D. Guidance	Joint Publications	Joint Patents /Products /Consultancy
C-MET, Pune	Nanocatalysts preparation for fuel cells				
IIT Madras	Solar energy	A compact solar dryer for agricultural products	<u>Nil</u>	<u>Nil</u>	<u>Nil</u>

#### B. With Industry

Name of the Industry	Broad Area of Collaboration	Joint Projects	Joint Ph.D. Guidance	Joint Publications	Joint Patents /Products /Consultancy
Sainergy Fuel Cell India Private Limited, Chennai	Development of Nanocatalyst for PEM fuel Cells				
BHEL Corporate R&D, Hyderabad	Fuel Cells	M.Tech. project	-	01 (Conference)	-

### IX. Faculty Development Programmes Conducted (Conferences/Workshops/Seminars)

Name of the Programme	Sponsoring Agency	Period	No. of participants	Remarks
Synthesis, Characterisation, Processing and Applications of Nanomaterials	GIAN MHRD	7 <sup>th</sup> -11 <sup>th</sup> March, 2016		

Sonoprocess Engineering	GIAN MHRD	22 <sup>nd</sup> -26 <sup>th</sup> February, 2016		
Model Based Digital PWM Control Techniques for Power Electronics Applications	TEQIP Phase-II	25 - 26 October 2013		<b>Coordinators:</b> <b>Dr.B.L. Narasimharaju &amp; Dr. S. Srinivasa Rao</b>
Power Control and Energy Management	TEQIP Phase-II	09 - 11Th May 2013		<b>Coordinators:</b> <b>Prof. D M. Vinod Kumar &amp; Dr. B.L. Narasimharaju</b>
Two day national workshop on "Fuel cells and Flow batteries for sustainable energy systems"	TEQIP-II	11-12, July 2014	30	<b>Coordinators:</b> <b>Dr. P. V. Suresh Dr. S. Muralimohan</b>

X. Faculty Development Programmes Attended (Conferences/Workshops/Seminars)

Name of the Programme	Organisation and Location	Period	Remarks
Teaching and Learning for Excellence	NIT Warangal	17 <sup>th</sup> - 19 <sup>th</sup> July 2012 (3 days)	
Modelling, Analysis and Control of Mechatronic Systems	NIT Warangal	27 <sup>th</sup> - 29 <sup>th</sup> July 2012 (3 days)	
National Conference AECT2013	MIT Manipal, India	7 <sup>th</sup> to 9 <sup>th</sup> February 2013 (3 days)	
Teaching and Learning for Excellence	NIT Warangal	15 <sup>th</sup> - 17 <sup>th</sup> July 2013 (3 days)	
Good Laboratory Practices	NIT Warangal	13 <sup>th</sup> September 2013	
Open Source Softwares	NIT Warangal	14-15, March 2014	
NI Training on LAB-VIEW Software	Taj Hotel, Hyderabad	26 <sup>th</sup> September 2014	
Rapid Prototyping Systems	NIT Warangal	27 <sup>th</sup> September 2014	
National Conference AECT-2015	MIT Manipal, India	23rd - 24th January 2015	
Digital Signal Processor Controlled Power Electronic Converters & Drives (DSPEC-2015)	NIT Warangal	28-30th, September 2015 (3 days)	
7 <sup>th</sup> IEEE conf. on Technology for Education (T4E-2015)	NIT Warangal	10-12 Dec, 2015 (3 days)	
" Sharing of achievements	Siddaganga Institute of	21 <sup>st</sup> to 23 <sup>rd</sup> April 2016	

and Innovative ideas of CoEs	Technology Tumkur & SPFU Bangalore, Karnataka	(3 days)	
------------------------------	---	----------	--

XI. Research/Collaboration related visits made by the CoE members:

Name of the Organisation	Broad Area of Collaboration	List of COE Members visited	Outcome of the Visit	Remarks
IIT Madras	Solar Energy and Nanofluids and its implementation for thermal management	<a href="#">Dr.D. Jaya Krishna</a>	<a href="#">Could come to know different technologies for the utilization of solar energy</a>	
NISE (National Institute of Solar Energy)	Solar thermal technologies	<a href="#">Prof. S. Srinivasa Rao</a> , <a href="#">Dr.D. Jaya Krishna</a> , <a href="#">Dr. K. Kiran Kumar</a>	<a href="#">Could understand different solar thermal technologies for power generation</a>	
Name of the Organisation	Broad Area of Collaboration	List of COE Members visited	Outcome of the Visit	Remarks
Sainergy Fuel cell India Private Ltd., Chennai	Fuel Cells	<a href="#">Dr. P. V. Suresh</a> <a href="#">Dr. G. Nagasreenivasulu</a>	Procured Fuel Cells and other components	

XII. Research/Collaboration related visits made by the outside Experts to the Institute:

Name of the Organisation	Broad Area of Collaboration	List of COE Members visited	Outcome of the Visit	Remarks
ICT, Mumbai	Nanocatalysts & Design of Fuel cell	Prof A B Pandit		
CMET Pune	Fuel cell catalysis	Dr B B Kale		
<a href="#">Center for Fuel cell Technology (CFCT),</a>	<a href="#">Fuel Cells</a>	<a href="#">Dr. K.S. Dathathreyan,</a>	<a href="#">Center for Fuel cell Technology</a>	<a href="#">Fuel Cells</a>

Chennai		Associate Director CFCT, ARCI Chennai Dr. R. Balaji, Sr. Scientist CFCT, ARCI, Chennai	(CFCT), Chennai	
Center for Fuel cell Technology (CFCT), Chennai	<u>Fuel Cells</u>	Dr. K.S. Dathathreyan, Associate Director CFCT, ARCI Chennai Dr. R. Balaji, Sr. Scientist CFCT, ARCI, Chennai	Center for Fuel cell Technology (CFCT), Chennai	<u>Fuel Cells</u>

XIII. Details of the Models /Products /Innovative Technologies developed /being developed:

Title	Persons associated	Brief description	Utility	Status of Commercialization

XIV. Academic Outputs:

List of New Programmes started

List of New Laboratories Developed: The equipment procured under TEQUIP-II has been housed in the 'Thin Film and Device Lab' in the 'Centre for Advanced Materials' along with other facilities for the benefit of students and research scholars of our institute.

List of New Subjects Introduced

XV. Sustainability Plan

A. Externally Funded sponsored Projects obtained/applied for:

Title of the Project	Funding Agency	Amount	Date of Sanction	Status
Prototype development of fuel cell using	Department of information and	104 Lacs	2014-17	Ongoing

functional nano - materials	Technology, Govt. of India			
Design and Fabrication of a Mini Indirect Type Solar Drier for Drying of Grains, Fruits and Vegetables	DST	57.552 Lakhs	Project was applied on Jan 2016	Under communication
Nanostructured 'La' doped BaSnO <sub>3</sub> Electrodes for high efficiency Dye-Sensitized solar cells	DST-SERB- Young Scientist Scheme	26.16 Lakhs	21-12-2015	Ongoing
Design and Development of High Efficient Switched Reluctance Motor based Solar Photovoltaic (SPV) Water Pumping System	<u>IMPRINT-India, MHRD</u>	<u>Rs. 70.98 Lakhs For 3 years duration</u>	<u>Result Awaited</u>	<b>Submitted Full proposal for Phase-III Evaluation</b>
Solar / Wind Hybrid Power based Resonant Inverter for Multiple-Load Induction Cooking system for Rural areas.	IMPRINT-India, MHRD	Rs. 57.00 Lakhs For 3 years duration	Result Awaited	<b>Submitted Full proposal for Phase-III Evaluation</b>
Solar Power Based Soft Switched Power Converters For LED Street Lighting System	CPRI Bangalore	Rs. 43 Lakhs For 2 years duration	Result Awaited	<b>Revised Proposal Submitted &amp; Acceptance awaited</b>
<i>Solar Power Based High Voltage Power Supply for Radar applications.</i>	ER&IPR, DRDO, Delhi	35 Lakhs For 3 years duration	Result Awaited	<b>Submitted &amp; Under Review</b>
Design and development of <i>Solar Power fed LED Lighting System</i>	ER&IPR, DRDO, Delhi	25 Lakhs For 2 years duration	Result Awaited	<b>Submitted &amp; Under Review</b>
Development of 20 kW/100 kWh Redox Flow Battery System for Solar PV Applications	MHRD, Gol under IMPRINT Scheme	5 Crores	-	<b>der review (III Phase)</b>

B. Consultancy works taken-up / Scope:

Nature of work	Prospective Customers	Amount	Remarks


XVI. Expenditure and fund position (in Rs. Lakh only)

<u>Opening balance on 1<sup>st</sup> April 2016</u>	<u>Amount received during April-Sept 2016</u>	<u>Amount Spent</u>	<u>Balance available</u>

XVII. Good Practices to be shared with other CoEs

XVIII. Key Issues and Concerns regarding the CoE

**Half yearly Plan for the next half year (October-March 2017)**

<u>Deliverable</u>	<u>Likely cost (in Rs lakh)</u>
1. If we could procure a 'Solar Simulator with IV Characteristics' to create the solar radiation in the laboratory, it will be immensely useful to characterize the fabricated solar cells. – Until now there is no one such instrument in our institute despite the fact that it is an very basic equipment for researchers working in the area of solar cells.	50 Lakhs
2. More funding for equipment, chemicals and contingencies for the centre will be helpful since the starting chemicals involved in the fabrication of solar cells are very expensive.	05 Lakhs per year per faculty

**Key Issues:-**

**1. Procurement of Goods/Equipments:**

For the purchase of customized products (Ex: Experimental set-ups/Test Rigs) provision may be given to purchase on "Single Quotation Basis" within same financial limit of Rs. 1.00 lakh.

**2. Purchase of Softwares:**

Software are proprietary in nature. In such cases, price justification is becoming difficult. Purchases must be facilitated by NPIU/MHRD/WB authorities.

3. Provision must be made for consumables in the grants.

4. International travel guidelines may be relaxed for faculty exchange/ training in foreign universities.

5. To motivate/encourage students to work in the thematic areas of the CoE, say summer Internship for the students of the parent Institute and from other Institutes, some provision may be made.