

## TECHNICAL WORKSHOPS SERIES – 2017

Tinkering Lab Activity Club <b>Hands-on Workshop on Renewable Energy &amp; Energy Efficiency</b> <b>Build your own PROTOTYPES!</b> <i>- Organized by Tinkering Lab, Venture Center -</i>	
<b>Potential gains</b>	Participants will be able to – <ul style="list-style-type: none"> <li>• Get a background of different green energy sources</li> <li>• Appreciate the applications of these sources in daily life</li> <li>• Build small prototypes based on the knowledge gained during the workshop</li> </ul>
<b>Workshop Director</b>	Dr. Bala Pesala, Senior Scientist (CSIR-CEERI), Chennai, India
<b>Organized by</b>	<ul style="list-style-type: none"> <li>• Tinkering Lab, Venture Center</li> </ul>
<b>Supported by</b>	<ul style="list-style-type: none"> <li>• Venture Center</li> </ul>
<b>For whom</b>	<ul style="list-style-type: none"> <li>• Age group 14-18 yrs old (8th-12th standard)</li> <li>• Familiarity with English required</li> </ul>
<b>When</b>	<b>Start date: Fri-Sat, 1-2 Dec 2017 , Time: 9.00 AM to 5.30 PM</b>
<b>Where</b>	Lecture Theatre, Venture Center, 900 NCL Innovation Park, Dr. Homi Bhabha Road, Pune
<b>Contact</b>	Ms. Lipika Biswas   Phone: 91-20-25865877; 9172232214 Email: <a href="mailto:eventsdesk@venturecenter.co.in">eventsdesk@venturecenter.co.in</a>
<b>Cost</b>	Cost: Rs 5,000 Register at: <a href="https://goo.gl/hi1PtE">https://goo.gl/hi1PtE</a> Seats limited to 20  Note:- <ul style="list-style-type: none"> <li>• Attendance only after confirmation of registration by organizers.</li> <li>• Organizers reserve the right to accept or refuse or delay registrations so as to optimize the composition of the group and hence maximize learning for all participants.</li> <li>• Fees once paid will not refundable and transferable under any circumstances.</li> </ul>

### Introduction

This workshop on Renewable Energy is for creating excitement in young kids about renewable energy. As we know modern economies rely heavily on carbon based fuels such as coal, gas and oil for meeting their energy needs which is not sustainable in the long run. Hence awareness about renewable recourses to found out solution is must. Renewable energy field is undergoing dramatic growth as governments and energy companies around the world look to renewable energy sources to solve the energy problem in power and transportation sectors.

### Workshop Outline

A typical session will have:

- An introductory talk regarding a source of energy
- An hands-on session to build a prototype based on the knowledge in the theory session

Topics to be covered:

- **Solar Energy**  
 Solar Thermal :Make your own Maggie/popcorn by harnessing the power of Sun  
 Solar PV: Make your own solar fan and test it
- **Wind Energy**  
 Build a wind turbine from the household stuff  
 Light an LED from wind power
- **Smart Home Monitoring System**  
 Sense your environment with open source hardware :Digital temperature sensor  
 LED blinking with Microcontroller & LCD Displays - Project your ideas
- **Batteries**  
 Convert fruits as instant source of electrical energy

### Workshop includes

- Workshop includes refreshment breaks with Snacks and Lunch.
- Membership in mailing list for all participants
- Tour of the Venture Center campus with all the laboratory facilities
- Participation Certificate (for 100% attendance)

### Workshop does not provide

- No ranking or scoring shall be provided. Idea is to enjoy the concepts and live demonstration of the renewable resources.
- Transportation will not be provided by organizers.

### Dates for Workshop Sessions

Dates		Illustrative themes for Workshop
Friday	- 1 <sup>st</sup> Dec 2017	Solar energy
		Wind energy
Saturday	- 2 <sup>nd</sup> Dec 2017	Smart home monitoring system
		Batteries

Schedule		
Time	Session title	Faculty
<b>Day 1 : Friday 1<sup>st</sup> Dec 2017</b>		
0830-0900	Registration : 900 Foyer Area	
0900-0930	Welcome to Venture Center and introduction to the workshop	V. Premnath
0930-1000	Introduction to Solar Energy as a renewable source: Solar thermal and Solar PV	Bala Pesala
1000-1015	Munch break	
1015-1100	Hands -on session: Solar Thermal : How to make your own Maggie/popcorn by harnessing the power of Sun	Bala Pesala with volunteers
1100-1300	Hands -on session: Solar PV: How to make your own solar fan and test it	Bala Pesala with volunteers
1300-1400	Refueling break	
1400-1515	Introduction to Wind Energy as a renewable source	Bala Pesala
1515-1530	Juicy break	
1530-1700	Hands -on session: - Build a wind turbine from the household stuff - Light an LED from wind power	Bala Pesala with volunteers
1700-1730	De-briefing for the day and the way ahead	Bala Pesala
<b>Day 2 : Saturday 2<sup>nd</sup> Dec 2017</b>		
0900-1000	Introduction to renewable source & energy efficiency	Bala Pesala
1000-1015	Munch break	
1015-1100	Hands -on session: Smart home monitoring system Sense your environment with open source hardware : Digital temperature sensor	Bala Pesala with volunteers
1100-1300	Hands -on session: LED blinking with Microcontroller LCD Displays - Project your ideas	Bala Pesala with volunteers
1300-1400	Refueling break	
1400-1515	Hands -on session: Batteries: Convert fruits as instant source of electrical energy	Bala Pesala with volunteers
1515-1530	Juicy break	
1530-1700	Session continued:	Bala Pesala
1700-1730	Feedback and Valedictory	

**Faculty and volunteers (in alphabetical order of last names)**

<p>Bala Pesala</p> 	<p>Bala Pesala is currently a senior scientist at Council of Scientific and Industrial Research (CSIR), Chennai and an assistant professor at Academy of Scientific and Innovative Research (AcSIR). His research interests range from Solar energy, Terahertz imaging, Integrated photonics to non-invasive diagnostics. Bala has received his B.Tech and M.Tech both in Aerospace engineering from IIT Madras in 2003. He received his PhD in Electrical Engineering from University of California at Berkeley in 2009. His thesis work was focused on slow and fast light using semiconductor optical amplifiers for RF and all-optical communication applications. At Berkeley, he also received minor degrees in Business and Nanotechnology. Subsequently, he did his post-doctoral research in the same group on using novel high-contrast gratings for Integrated optics. He received several awards including CSIR Young Scientist Award (2016), Demitri Angelakos memorial achievement award (UC Berkeley 2009), Rafael Rodriguez Golden Age Fellowship (UC Berkeley) and Silver medal for the highest GPA in Aerospace engineering (IIT Madras 2003) to name a few. He has authored/co-authored more than 50 publications in leading peer reviewed journals and conferences.</p>
<p>Premnath Venugopalan</p> 	<p>Premnath is Founding Director of Venture Center and Head, NCL Innovations. He holds a B.Tech from the Indian Institute of Technology - Bombay and a Ph.D. from the Massachusetts Institute of Technology, USA. He has also been a Chevening Technology Enterprise Fellow with the Centre for Scientific Enterprises, London Business School and Cambridge University, UK. He brings with him considerable experience in technology development and commercialization, working with start-up companies (in Cambridge-UK and India) and engaging with large corporations on research and consulting projects as project leader.</p>

**About the organizers**

	<p><b>About Tinkering Lab</b>          The Tinkering Lab is a facility developed and managed by Venture Center, NCL Innovation Park, Pune, India. The main aim of the Tinkering Lab is to help inventors and entrepreneurs to build prototypes of their ideas and generally “tinker” around exploring new ideas. The focus is on electronics, instrumentation and optics besides related prototyping and design.          For more information about Tinkering Lab: <a href="http://tinkeringlab.co.in/">http://tinkeringlab.co.in/</a></p>
	<p><b>About Venture Center</b>          Entrepreneurship Development Center (Venture Center) – a CSIR initiative – is a Section 60 company hosted by the National Chemical Laboratory, Pune. Venture Center strives to nucleate and nurture technology and knowledge-based enterprises by leveraging the scientific and engineering competencies of the institutions in the Pune region in India. The Venture Center is a technology business incubator supported by the Department of Science &amp; Technology’s National Science &amp; Technology Entrepreneurship Development Board (DST-NSTEDB). Venture Center focuses on technology enterprises offering products and services exploiting scientific expertise in the areas of materials, chemicals and biological sciences &amp; engineering. For more information, visit <a href="http://www.venturecenter.co.in/">http://www.venturecenter.co.in/</a></p>