## "A Perspective on Energy Security & Sustainability for India"

**BALDEV RAJ**
Director, National Institute of Advanced Studies, Bangalore
President, Indian National Academy of Engineering,
Chairman, Board of Governors, IIT, Gandhinagar,
President-elect, Council of Academies of Engineering and Technological Sciences (CAETS)
Chairman, Research Council, Defence, Metallurgical Research Lab, Hyderabad,
J C Bose Fellow, DST, India

### BIO DATA

Dr.Baldev Raj has served the Department of Atomic Energy over a forty two year period until 2011. As Distinguished Scientist and Director, Indira Gandhi Centre of Atomic Research, Kalpakkam, he galvanized a whole community of staff, scientists and engineers for advancing several challenging technologies, especially those related to the fast breeder test reactor (FBTR) and the prototype fast breeder reactor (PFBR). His work and stewardship has earned India status of amongst world leaders in these challenging technologies of importance to energy security.

He has nurtured and grown excellent schools of global stature in nuclear materials and mechanics, non-destructive evaluation, nano science and technology, corrosion, welding, separation sciences & technology, robotics & automation, energy systems and strategies, etc.

Dr.Raj has pioneered application of NDE for basic research using acoustic and electromagnetic techniques in a variety of materials and components. He is also responsible for realising societal applications of NDE in areas related to cultural heritage and medical diagnosis.

He is currently President, International Institute of Welding, President, Indian National Academy of Engineering and President-Research PSG Institutions, Coimbatore & Director, National Institute of Advanced Studies.

Dr.Baldev Raj is a Fellow of Indian National Science Academy, Indian Academy of Sciences, National Academy of Sciences, India and Indian National Academy of Engineering, The World Academy of Sciences (TWAS), German Academy of Sciences, International Nuclear Energy Academy and Academia NDT, International. He is Hon. Fellow, International Medical Sciences Academy.

Author of more than 970 referred publications , 70 books more than 20 contributions to encyclopaedia and handbooks, as well as owner of 22 patents, 380 honour, He has served in Advisory capacity for MahaRatna (great jewels) companies of India such as BHEL & NTPC and the private eminent companies such as Tata Steel and Bharat Forge.

He has been conferred Distinguished Alumnus Award of Indian Institute of Science, Distinguished Materials Scientist Award of Materials Research Society of India, National Metallurgist Award of Ministry of Steel, Government of India , Presidential honour Padma Shri. Indian Nuclear Society, Life Time Achievement Award(2011), Homi J Bhabha Gold Medal Award from the Prime Minister, India during 99th Indian Science Congress (2012) and Nayudamma Memorial Award, 2012,Life Time Achievement Award of National Association of Corrosion Engineer(2013), Materials Science Medal( 2010 ) and Brahma Prakash Memorial Medal (2013) of Indian National Science Academy, Eminent Engineering Award (2014) by Engineering Council of India.

## Abstract

The talk shall present energy demand scenarios (current and future) in the world and India. The pathways for realizing transition to low carbon energy foot prints shall be discussed. The giga challenges, magnitude of current efforts and directions to meet these challenges are an important part of the presentation. A few examples of key energy systems on the horizon, for meeting resource security criteria and sustained energy demands of India are dealt in a comprehensive manner. Pursuits of science to deliver technology outcomes in domains of materials, manufacturing and systems shall be discussed with examples. The talk shall also address intertwined issues of ethics and equity in meeting the aspirations of growing and resurgent India.