

*Transitioning the South Asian Energy Market:
Advancing Low Carbon Growth Through Regional Cooperation
and Cross-Border Energy Trade*

11-13 July 2011

***Clean Energy
Development in India***

12 July 2011

T: +9111-43027344

E: info @ aeee.in

www.aeee.in

 Alliance for anTM
Energy Efficient
Economy

Alliance for an Energy Efficient Economy

AEEE is a **member-driven** industry association providing a common platform for energy efficiency stakeholders **to collaborate** with the Bureau of Energy Efficiency for implementing the Energy Conservation Act, and National Mission on Enhanced Energy Efficiency (NMEEE)

Vision

An Energy Efficient India

AEEE Mission

AEEE addresses barriers to EE implementation through **policy research**; **facilitating market transformation**; **fostering technology innovations**; **capacity building of energy professionals** and **stimulating financial investments**

AEEE India



Large Corporate Members

Members



THE WEIDT GROUP



Specific Project Partners:



AEEE Membership base

Leading equipment manufacturers & integrated EE solution providers
Contributed to the Corpus Fund of AEEE

- **Schneider Electric (India) Ltd**
- **Thermax Limited**
- **Conzerv Systems Pvt Ltd** (Now acquired by Schneider Electric)
- **Grundfos Pumps India Pvt Ltd**

Present Large Corporate Members include

- **Johnson Controls India**
- **SKF India Limited**

Specific Projects or Training Partners

- **Honeywell & CISCO, Infosys, Wipro, Tata Pwr, Reliance Infra/ REMI**
(M&V Training/ CMVP Certification)
- **Forbes Marshall, FL Smidth** (for WHR initiative)

AEEE 40 Members – July 2011

Utilities and DisComs

North Delhi Power Ltd, New Delhi

Bangalore Electricity Supply Co (BESCOM), Bangalore

EE Companies & Consultants

Dalkia Energy Services Limited

SEE-Tech Energy Solutions

A.T.E. Enterprises Pvt Ltd

CEPT University

Alien Energy Pvt Ltd

Beblec (India) Pvt Ltd

Invensys India Pvt Ltd

IRG Systems South Asia

KLG Systel Ltd

Wipro Eco Energy

Customised Energy Solutions

Paharpur Business Centre

Spectral Services Consults Pvt Ltd

Ecofirst Advisory Services

Marc Eco Lighting Pvt Ltd

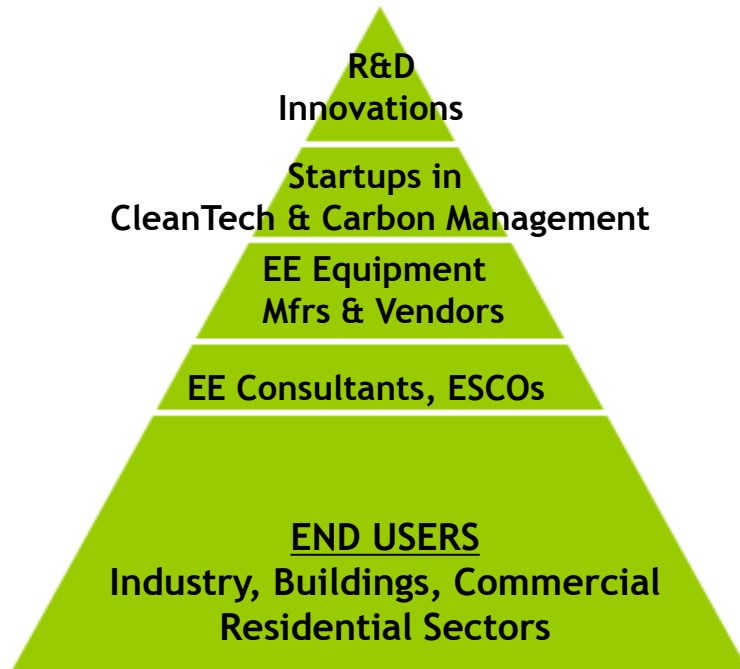
Tide Technocrats Pvt Ltd

Data Matrix Infotech Pvt Ltd

Aqua MW

Integrate Clean Energy & EE in all Sectors

“Mainstreaming energy efficiency in investment operations by systematically integrating energy efficiency operations within the core energy practice by replicating the *business-as-usual* and proven energy sector project designs and instruments” - WB EE Action Plan for Sustainable Development (2007)



Key Stakeholder for
Clean Energy Integration

AEEE's Support

- Interface on EE Policies & Regulations
- Participate & partner in EE implementation
- Identify Grants & Funding supports
- Access & dialogue with EE financing community (Banks & FIs)
- Interface between Start-ups & VC / Donors

Current Energy Scenario

- **India's Economic Growth – around 7-8 % annual in recent years**
- **Need to meet economic and environmental goals – through Renewables and Energy Efficiency**
- **Quality & Access are key challenges**
- **Demand supply gap as reported by CEA for 2009-10 was 84 TWh 10% of total requirement**
- **Peak demand deficit was more than 15 GW – a shortage of 12.7%**
- **To meet the anticipated demand in 2017, we need to double the current capacity to 300 GW**
- **Oil demand for Transportation by 2015 would be 40% higher than that of 2007 and 150% higher for 2030**
- **Renewable Energy has a key role to play in meeting this demand**

Renewable Potential and Achievement in India – Grid Connected

Sl. No.	Source / System	Estimated potential (MW)	Assumed PLF (%)	Annual Generation (billion kWh)
1	Wind	1,00,000	25	219
2	Small Hydro (< 25MW)	15,000	45	46
3	Bagasse	5,000	60	26
4	Biomass	17,000	60	88.72
5	Large Hydro (Existing & Future)	1,00,000	60	526
6	Waste to Energy	5,000	60	26.28
7	Solar CSP Based	2,00,000	35	613.2
8	Solar PV	2,00,000	20	350.4
9	Geothermal	10,000	80	70.1
	Total	6,52,000	-	1,966

Source: World Institute for Sustainable Energy, Pune, India. 2010

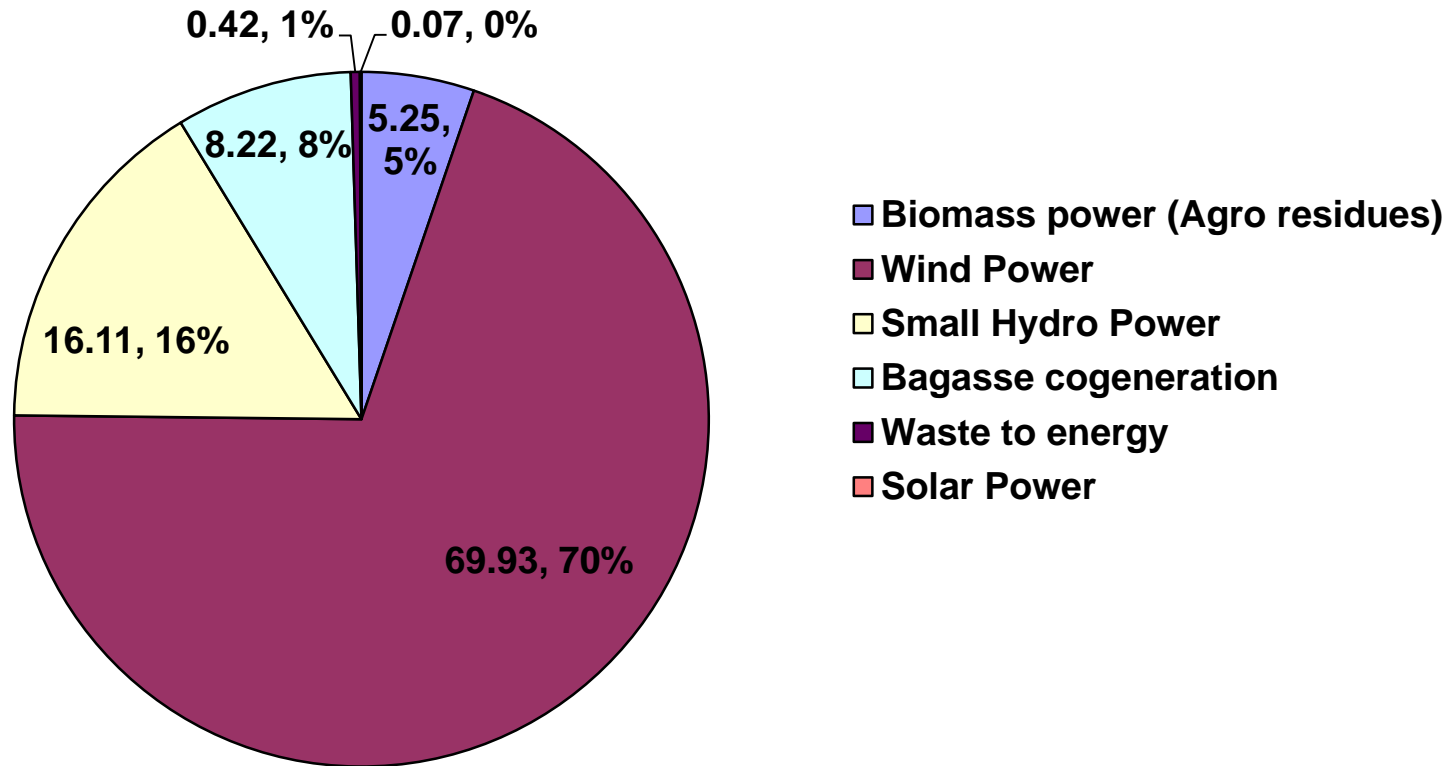
RE's Role in India's Energy Scenario-1

- **India has abundant untapped natural resources**
 - ❖ **Vast landmass receiving highest Solar radiation in the world**
 - ❖ **Long coastline and high wind velocity for land-based and offshore windfarms**
 - ❖ **Significant annual biomass production**
 - ❖ **Numerous rivers and waterways for hydro power**
- **RE a buffer against energy security concerns, reducing dependence on imported fossil fuels**
- **RE offers hedge against hike and volatility of oil and gas prices**
 - ❖ **Oil prices expected to increase by 50% in 20 years from 2010, where as PV systems are expected to decrease less than half of 2007 prices in the same period**

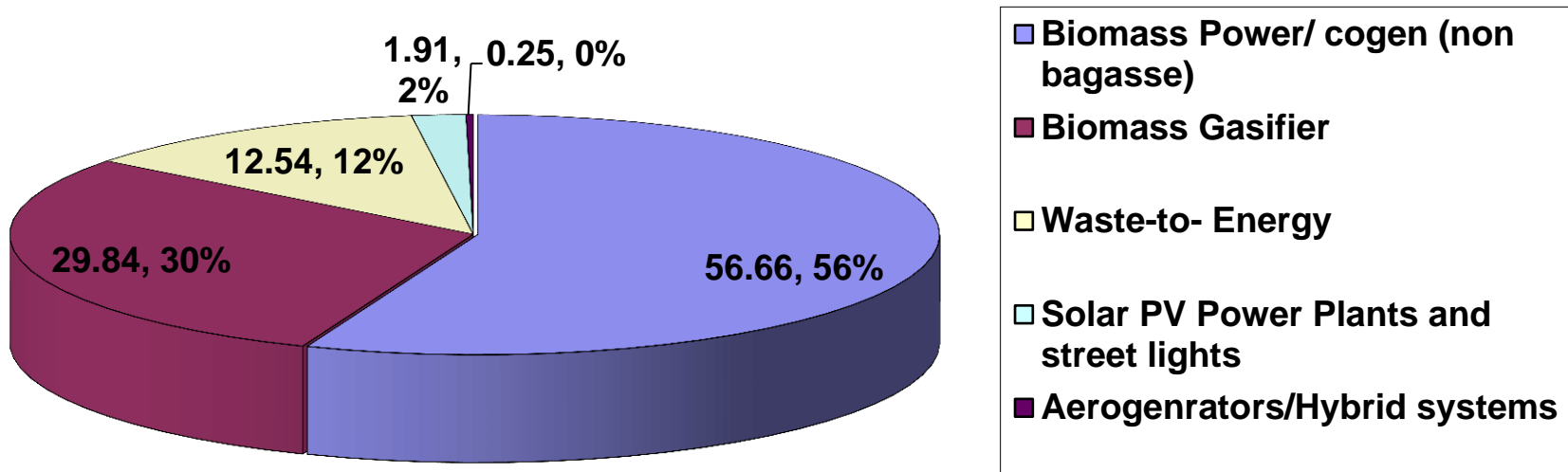
RE's Role in India's Energy Scenario-2

- Off-grid RE power can meet demand in unserved rural areas
- RE can be supplied to both urban and rural poor – addressing India's GHG concerns & goals
- RE can support climate change goals set under NAPCC and recent Carbon intensity goals
- India aims to emerge into a global leader in RE
- Vast opportunities for collaboration at regional level

Contribution of RE Technologies to Grid-connected Power



Contribution of RE Technologies to Decentralised Power



RE and “*Bottom of the Pyramid*” Market

- RE offers unique opportunity to meet the energy needs of the *bottom of the pyramid* population
- Micro Finance Institutions provide credit to individual or local NGOs for purchase of RE systems: Solar lanterns, Solar cookers, small biogas plants in off-grid areas
- A few successful models of micro-hydels and water mills, managed by local community and cooperatives

Financing RE in India

- **Clean energy investment worldwide Reached US\$ 162 billion in 2009**
- **India has been a part of the boom in investment in RE**
- **Total financial investment in clean energy in India was \$ 135 billion in 2009, ranking 8th in the world, according to UNEP study.**
- **E&Y ranks India the fourth most attractive country for RE investment in the world, only behind US, China & Germany**

Initiatives toward Low Carbon Growth to address Climate Change

- **CNG Based public transport in New Delhi and other cities**
- **Metro Rail Systems in major metros. Delhi has nearly 200 km network and growth**
- **Standards and Labeling Programme for Appliances driving our inefficient equipment**
- **Energy Conservation Building Codes – moving from Voluntary to Mandatory**
- **Information Technology growth and lower energy intensity of economy**
- **India's active participation in CDM process – over 500 – projects regd**
- **Promoting Green Entrepreneurship - WRI, CII – New Ventures India**
- **Voluntary Carbon Disclosure by Indian Companies**

Thank you



Large Corporate Members

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Specific Project Partners:

