Small Wind Turbines & Hybrid Systems

Opportunities & Suggestions

INDIAN SMALL WIND ASSOCIATION

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Application possibilities limited only by imagination !

... electrification of schools, houses etc
... remote areas, rural electrification
... telecom towers
... domestic, commercial applications
... Railways, Defence

... and so on

Huge untapped potential !

Off-Grid Applications

Strength and potential lies in the ability to generate Power in decentralised and distributed mode

→

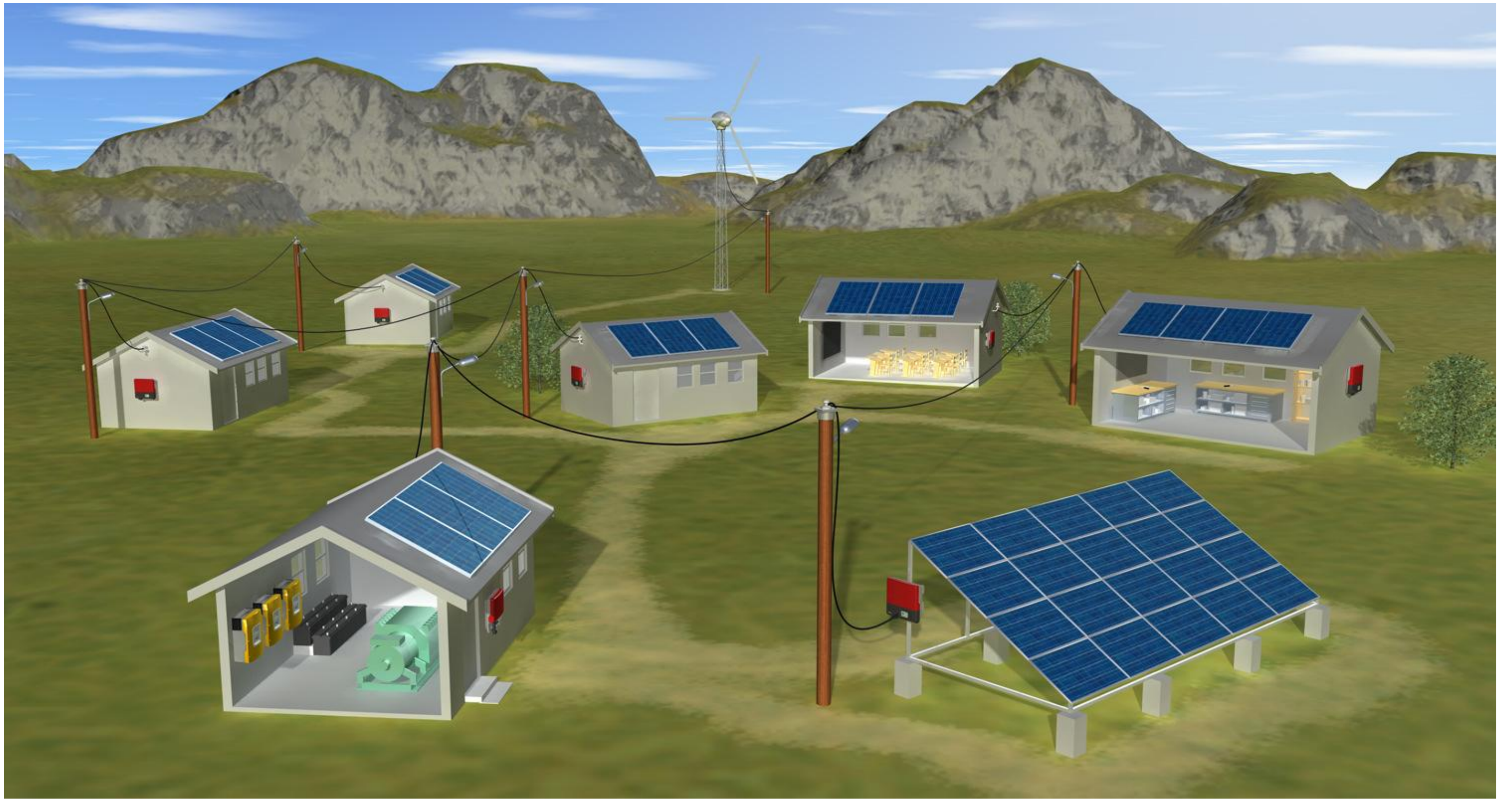
production at consumption points

Summary – SWT different applications

					Wind-diesel									**Wind mini-farm**			
			Wind hybird								**Single wind turbine**						
Rated power/system	**Wind home system**									**Build integrated**							
P < 1 kW	X	X	X	X	X	X	X			X	X	X	X				
1 kW < P < 7 kW	X	X	X	X	X	X	X	X			X	X	X	X	X	X	X
7 kW < P < 50 kW					X	X	X	X	X				X	X	X	X	X
50 kW < P < 100 kW								X	X						X	X	X
Small wind systems applications	Sailboats	Signalling	Street lamp	Remote houses/ dwellings	Farms	Water pumping	Seawater desalination	Village power	Mini-grid	Street lamp	Buildings rooftop	Dwellings	Public centres	Car parking	Industrial	Industrial	Farms
	Off-grid applications									On-grid applications							

Source: CIEMAT

…Modular …different sources … extendable



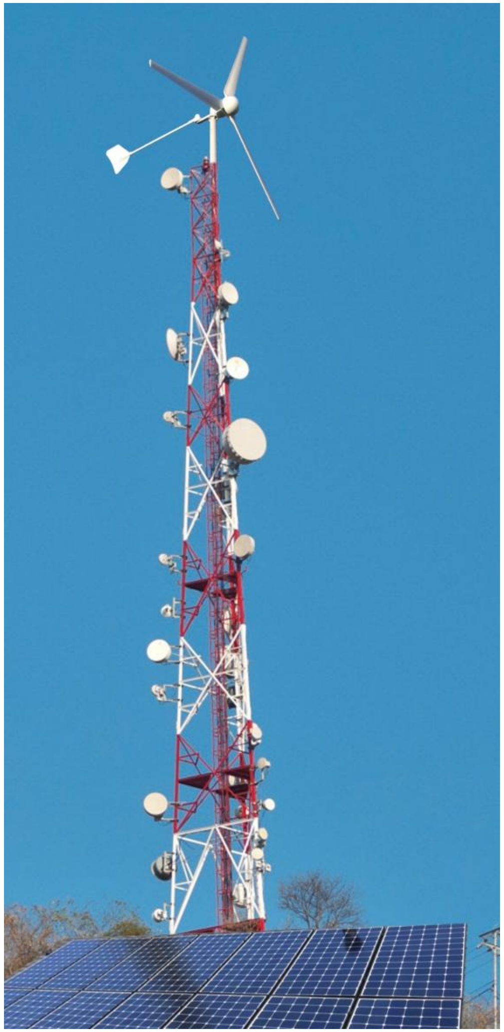
Residential

Industrial

Rural Electrifications

School electrification

Telecom towers



School electrification

Railways

Railways

Applications :

Rural Market Sector

- Largest potential market for small wind turbines….
- Rural India ….about 35% population has little or no energy access for their living or livelihoods

- Rural electrification major opportunity!

Railways

- Hybrid systems for Level Crossing Gates & Stations

Defence

- Hybrid systems for defence establishments especially at remote areas

Large wind turbine industry ….strong presence in India

Wind-Solar hybrid systems installed under MNRE programme
(up to March 2016) : 2.7 MW

Its time to exploit the potential of small wind & solar systems

- Potential for real contribution to our energy supply
  …self-reliance for energy needs
- Simple, Reliable, User-friendly technology
- Market for small wind turbines also fuels ancillary industries, (composite products, steel, towers, power electronic equipment construction projects etc.)

Small wind gaining prominance in India

Thanks to MNRE, NIWE, SNAs and all stakeholders

- The potential of power generation from small wind systems is not yet reported and available in the public domain.
- NIWE (C-WET), had assessed power generation potential more than **50,000 MW** from small wind turbines
- The World Institute of Sustainable Energy (WISE) had estimated micro-generation potential of the order of 83,000 MW.

So why not target 1000 MW in National Wind Energy Mission

Promoting Small Wind : Needs a helping hand

national wind energy mission

- *National wind energy mission for 100GW wind power*
- *Suggest inclusion of min. 1GW by small wind*
- *Distributed power – no transmission loss*
- *Small wind turbines for low wind speed areas, unfit for large wind farms*
- *Wind – Solar complimentary sources*

Telecom applications :

- Powering by Renewables (Wind-Solar Hybrid) mandatory e.g. 5% % towers per year
- Initial 50-100 nos. Telecom towers for trial
- Guidelines to from DOT
- Special drive by MNRE

SWES Target areas

- Railways
- Defence
- Rural Electrification
- Private / Industry
- Educational Institutes
- Telecom
- Govt. offices & others

Support to small wind industry

MNRE Policies incl. that for telecom, low windy states etc.

NIWE support for certification

SNA’s initiatives for implementing wind-solar hybrid projects in states

Value Creation

- ✓ Environment
- ✓ Energy Independence, Self-reliance
- ✓ Image enhancement
- ✓ High visibility, particularly for commercial consumers

Creat Awareness to Increase Acceptance

- ✓ Emphasize the positive –
  quiet, safe, renewable, non-polluting source of energy
- ✓ Supply objective data –
  resource potential, photographs of equipment

MARKET Opportunities & Impediments

Key Drivers –

- Unreliable power supply
- Limited access to electricity in rural area
- Weak rural grid
- Reduced dependency on utility supply
- Increasing cost of fossil fuel (diesel)
- Free resource availiabilty, no running costs
- Huge untapped potential
- Capital subsidy from Govt.
- Associated green tag & image

Impediments –

- Heavy cross subsidised electricity tariff
- Direct subsidies to LPG and diesel
- Higher capital costs of small wind hybrid systems
- Recurring battery cost & maintenance
- No experience of grid tied systems
- No collaborated industry efforts
- Limited awareness

SUPPORT REQUIRED

CFA	• **Higher targets** • **Smoother & quicker implementation process** • **CFA for Individuals** • **Mobilization advance, low interest loans** • **Policy/ regulatory certainty in government schemes – MNRE subsidy schemes for small wind hybrid off-grid lighting, mini-grids, etc.**
Tendering Specifications	• **Guidelines for tendering** • **Standardization of specifications (towers, batteries, AMC etc.)**
Indigenious R&D	• **More indigenious R&D initiatives especially for low wind operations** • **Industry – Institutions collaborations**

SUPPORT REQUIRED

Roof-top / Grid-tie systems	• **Policy for roof-top hybrid systems** • **Netmetering, grid-tie operations**
Empanellment	• **Certification of similar versions based on operational data** • **Stringent norms to be reasonably relaxed to boost the market**
***Taxes** (VAT, Customs etc)*	• **Level playing field with other RE sources like Solar** • **Why VAT on wind / hybrid systems while SPV enjoys 0 %** • **All BOS Components Batteries etc. attract EXCISE / VAT Approx. 25 TO 28 %** **Set off mechanism may be looked into**

Support & catalyze India's small wind market as part for DCE

Industry body focussing on financing, policy, capacity building and technology

InSWA has XX members working across India...

...and with various application of SWT technologies

- Recognize DCE (Decentralised Clean Energy) contributions under infrastructure creation
- Special allocation under the National Clean Energy Fund (NCEF) for energy access using Small Wind+Solar Hybird systems; special allocation to coal rich states
- Use of such funds from the NCEF, Green Climate Fund, Rural Infrastructure Development Fund, etc. as guarantees to leverage commercial capital for enterprise and end user finance
- Financing for technology innovation – low cost, India desiged SWTs storage solutions, pay as go metering, remote data sensing, etc. Allocation under Atal Innovation Center.
- Sub-targets under Priority Sector Lending for financing of energy access through Wind+Solar Hybrid systems
- Policy/ regulatory certainty in government schemes – MNRE subsidy schemes for small wind hybrid off-grid lighting, mini-grids, etc.
- Greater enforcement and smoother implementation of various financing measures - DRI targets, MUDRA scheme, etc.
- Level playing field for petroleum based fuels and small wind energy- same provisions under GST

Perspective of InSWA on SWT growth & Support required.

Potential Sectors. Business Case Established	Volume potential	What can InSAW do to accelerate the growth	Support Required.
Manned and Unmanned Railway Crossings	20,000+	Offer a standardised solution package for the LC gate/Cabin loads	RDSO clearance for NIWE/MNRE empanelled turbines.
Railway Track Signals	10,000 +	Develop 110V AC compatible equipment. Invest more PoC	Facilitate piloting of 100 signals
Wind Water Pump	50,000+	Design and certify pumps (AC and DC) suitable for SWT	NIWE certification. NABARD assistance
Armed Forces Border Areas	Few thousand	Consolidate performance/reliability data of all SWTs working now	One major workshop on SWT by NIWE/MNRE inviting key Defence officials
Wind+Solar Micro/Mini Grids	Few Hundreds	Design of hybrid system, logistics, Pay as go metering technology	Conflict with DISCOM Banks to accept mini grid assets as collaterals
Roof top Wind+Solar hybrid: Retail customers	Few thousand	DIY kit. Online/self help WRA for given LAT/LONG. Assurance on quality and annual generation.	Loans/financial assistance by Banks/MFIs/NBFCs to end user.

Thank you

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