Green Initiatives in Nepal (Ncell)



Deepak P. Pandey

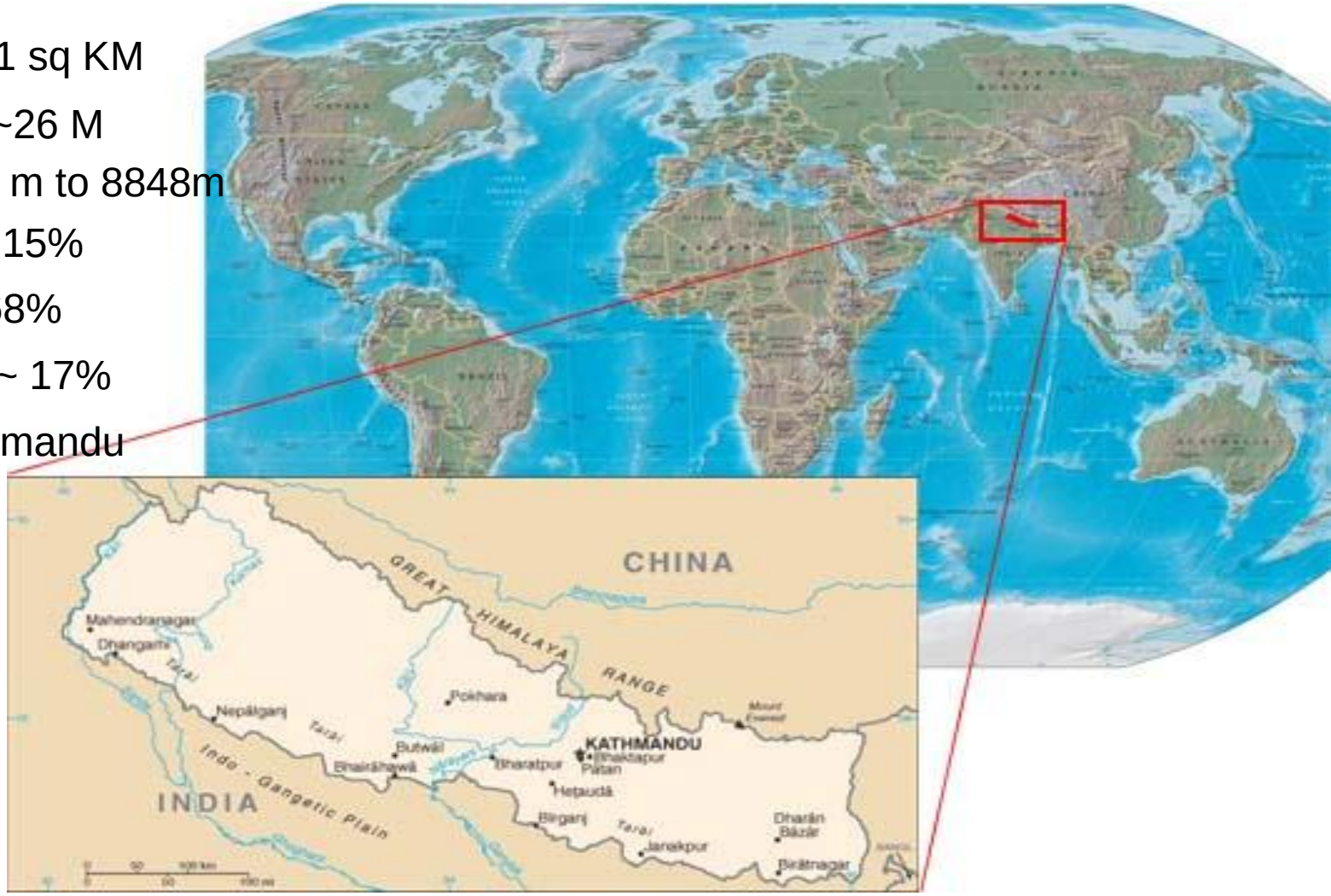
Ncell

Agenda

- **Electricity status in Nepal**
- Green Energy status in Nepal
- Ncell Introduction
- Green Initiatives in Ncell
- Green Deployment in Ncell
- Sample Feasibility Study
- Difficulties

Nepal Introduction

- Area : 147181 sq KM
- Population : ~26 M
- Elevation: 70 m to 8848m
- Himalayan ~ 15%
- Mountain ~ 68%
- Terai (Plain) ~ 17%
- Capital: Kathmandu



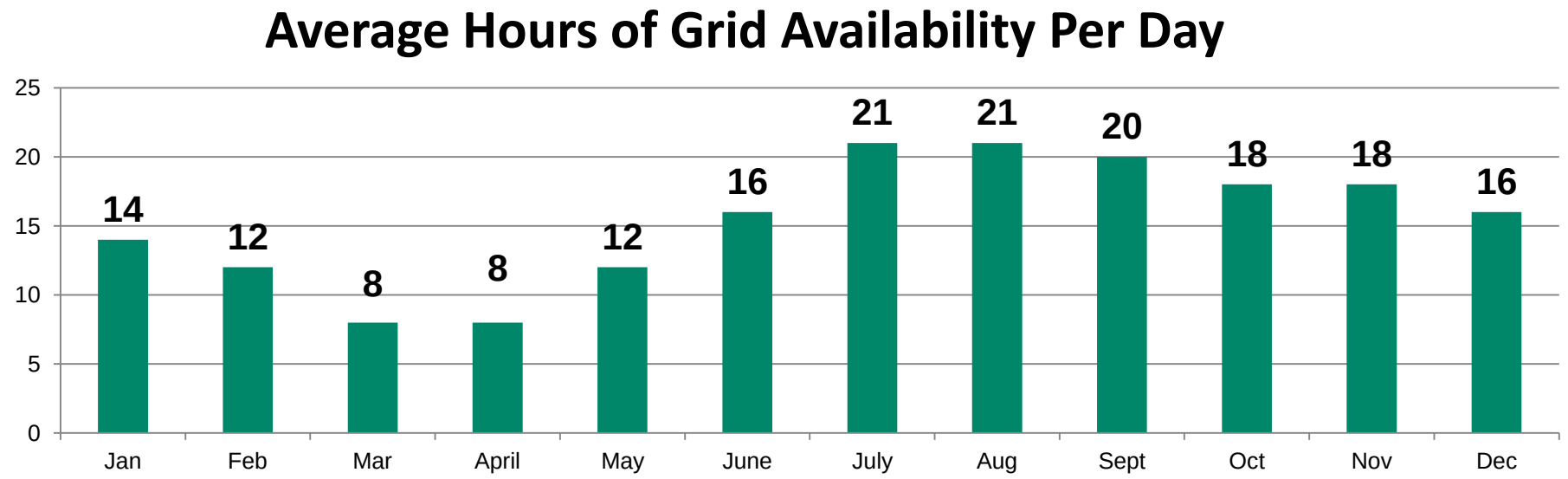
Electricity Status in Nepal

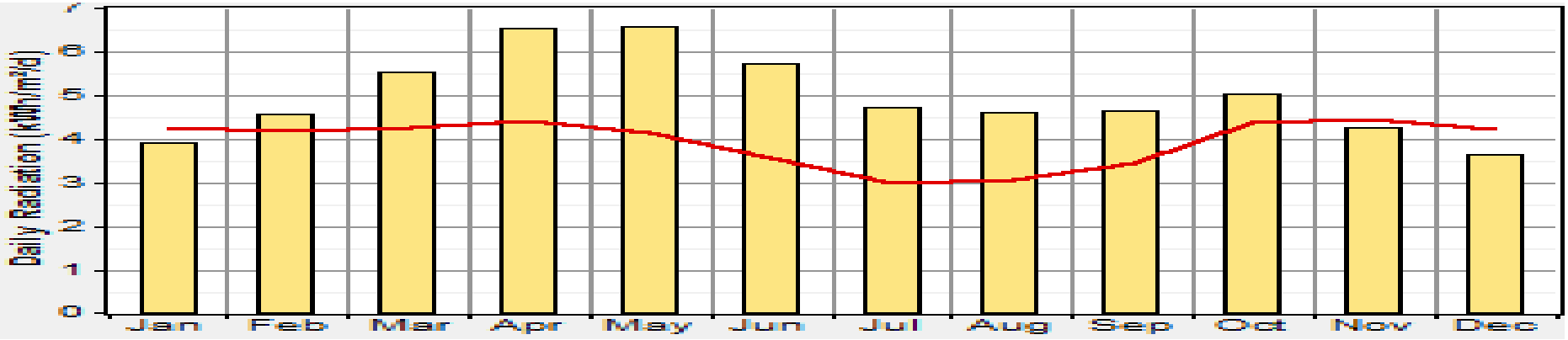
- Grid Availability in Nepal is seasonal and sinusoidal in nature.
- Primary source of power comes from hydro plants triggered by the monsoon and melting of ice from Himalayas.

		wet	dry
2008/09	Demand	704 MW	777 MW
	Supply	668 MW	385 MW
	Load shedding	2 hrs	10 hrs
2009/10	Demand	774 MW	845 MW
	Supply	668 MW	385 MW
	Load shedding	3 hrs	13 hrs
2010/11	Demand	843 MW	919 MW
	Supply	668 MW	385 MW
	Load shedding	4 hrs	15 hrs
2011/12	Demand	919 MW	1000 MW
	Supply	668 MW	385 MW
	Load shedding	5 hrs	17 hrs

http://www.ratnasansar.com/2010/02/electricity-crisis-load-shedding-in_17.html

Electricity Status in Nepal contd....





Solar Availability Pattern

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Green Energy : Need of Nepal

- Grid power is not enough to meet the demand.
- Fluctuation in Grid Power
- No grid in rural places
- Fuel cost and quality.
- Scarcity of fuel from time to time
- Fuel transportation is not feasible due to high head load and air transportation.

Green Energy initiatives from Government

Alternative Energy Promotion Centre (AEPC)

AEPC is a Government institution established on November 3, 1996 under the Ministry of Science and Technology with the objective of developing and promoting renewable/ alternative energy technologies in Nepal.

Following are the RE technologies under AEPC

- Biomass
- Mini/Micro Hydro
- Improved water Mill
- Solar Energy
- Wind Energy
- Geo thermal



400 watt small wind turbine

http://www.aepc.gov.np

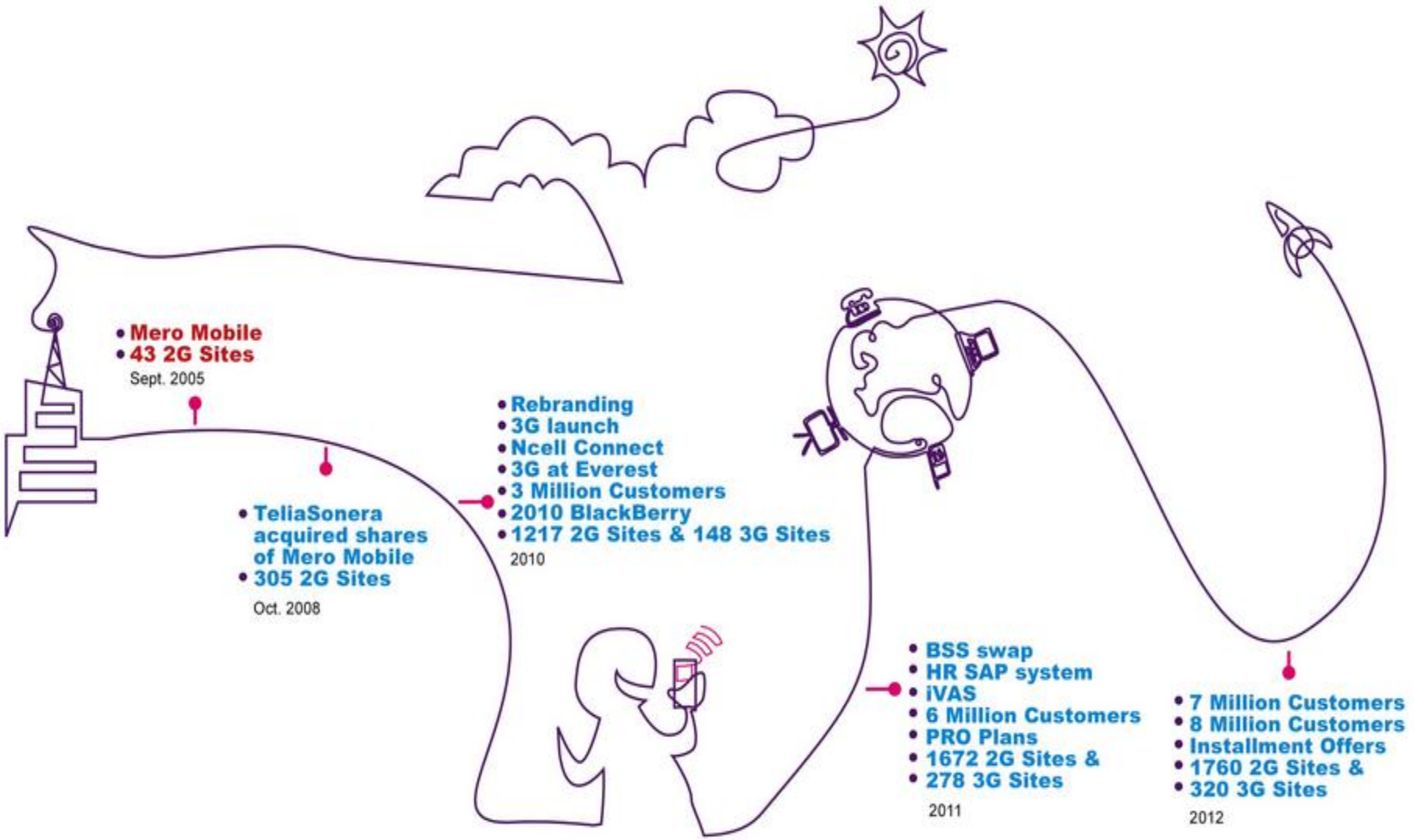
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General Introduction_Ncell

- Part of Teliasonera Group
- Number one GSM operator in nepal
- Population Coverage: 89.9%
- Geographical Coverage: 46.14%
- Coverage in all 14 Zones and 75 districts
- World’s highest 3G site running with Green Power

General Introduction_Ncell



Power Supply of sites in Ncell Network (*till June 2012*)

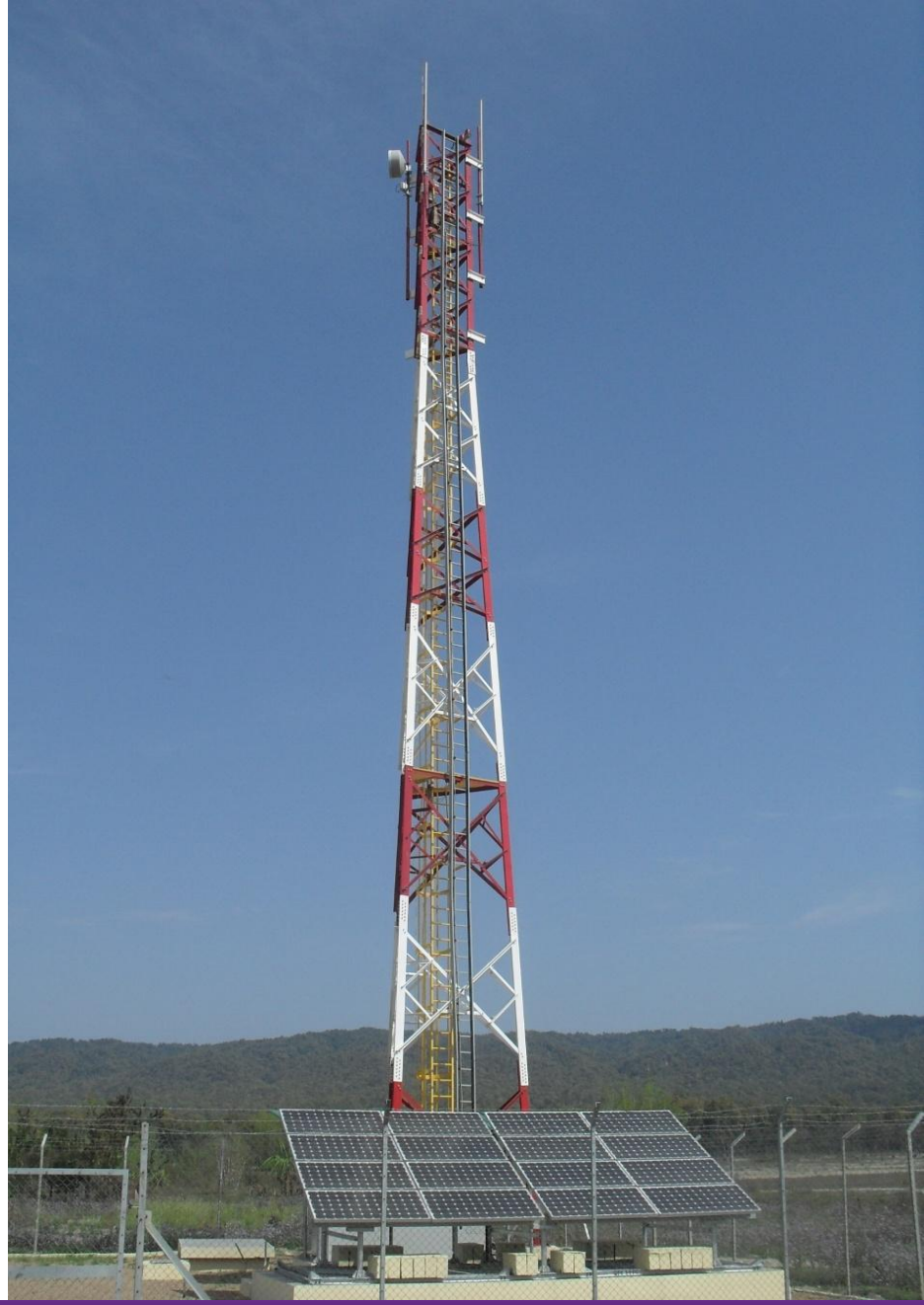
Power supply	Percentage	Number of sites
Grid only	17.19%	303
Grid +DG	81.55%	1437
Diesel Generator Only	0.17%	3
Solar Only	3.19%	69
Grid + Solar	0.11%	2
Solar +DG	1.02%	18

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Green Initiatives_Ncell

- Solar Deployment since 2009
- Low consumption BTS
- All Outdoor sites since 2010.
- GSMA feasibility Study
- Free cooling Trial
- Use of Deep cycle Batteries
- DC DG trial
- Low consumption Air conditioner
- DG-Battery Cycling



Outdoor site and FCU photos



Outdoor site



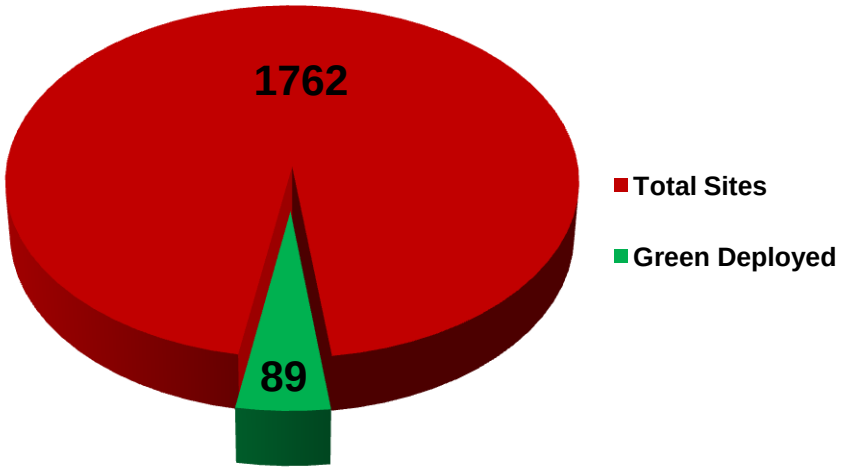
FCU

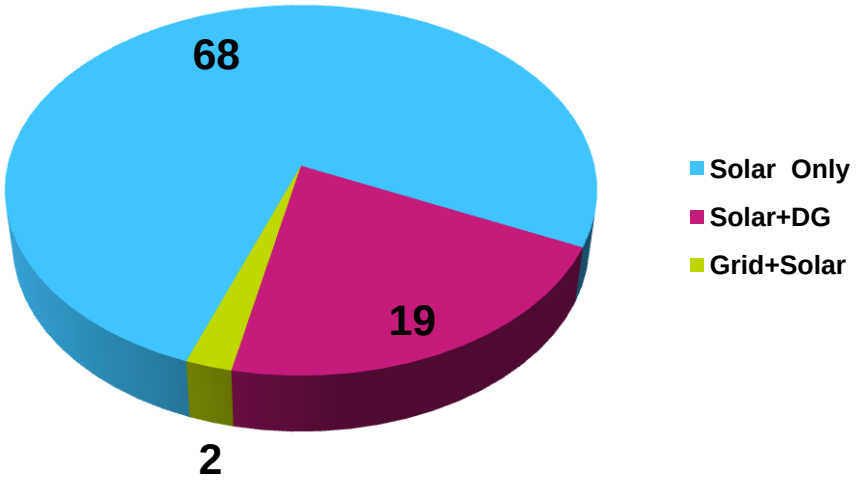


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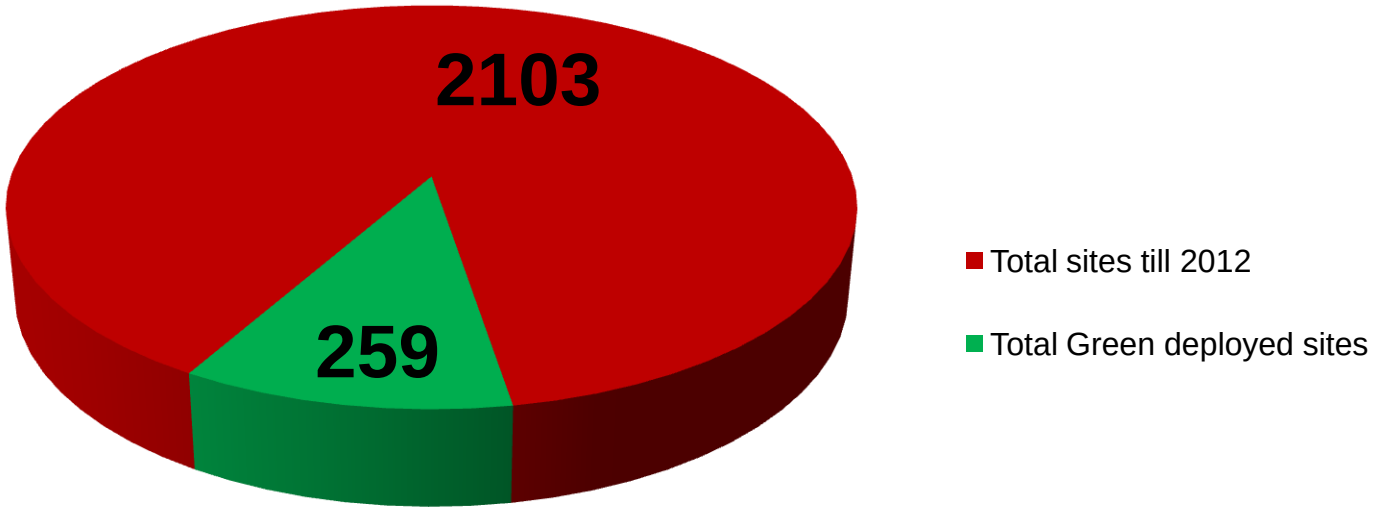
Green Deployment *(Till June 2012)*





Green Deployment	5.05%

Green deployment *(Plan till 2012…….)*



Green Deployment	12.31%

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Sample Feasibility Study

- Total Sites Analyzed: 1760
- Already solar installed : 89
- Solar Planned in 150 solar Project: 150
- Site Not Feasible for Solar after Survey for 150 project: 222
- DG Supplied from owner/Ncell HQ sites : 12
- Total Sites Remaining for Analysis: 1287

Site Modeling

Model	DG Available	Site Power	Site Count	Site Count
1	No	1100- 1500	17	147
2	No	1700- 2000	65	
3	No	2650- 3000	59	
4	No	> 3000	6	
5	10 KVA	1050 - 1270	70	124
6	10 KVA	1810 - 2150	52	
7	10 KVA	2605	2	
8	15 KVA	1050 - 1200	388	1016
9	15 KVA	1215 -1455	45	
10	15 KVA	1695 -1865	26	
11	15 KVA	1945 -2095	289	
12	15 KVA	2110 -2375	48	
13	15 KVA	2400 -2690	100	
14	15 KVA	2705 -3000	77	
15	15 KVA	3005 -3500	26	
16	15 KVA	3569 -5870	17	

Feasibility Study Results

Site Count	Payback Years
405	<4
122	>4 <6
334	>6<7
426	Deep Cycle Batteries
1287	ALL SITES ANALYSED

Models	Site Count	Percent
Renewable	861	66.9%
Deep Cycle	426	33.1%

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Difficulties

- No space for solar in RT sites.
- Buildings are not so strong to hold the extra loads.
- Trees making shadow in GF sites for solar.
- Access problem. Head load and airlifting making project cost very high.
- Seasonal Limitations.
- Snow fall on panels in high altitude area.
- Battery heating is required due to very low temperature.
- Dust on Solar Panels.
- High Initial CAPEX.





Go Green!!

Thank You











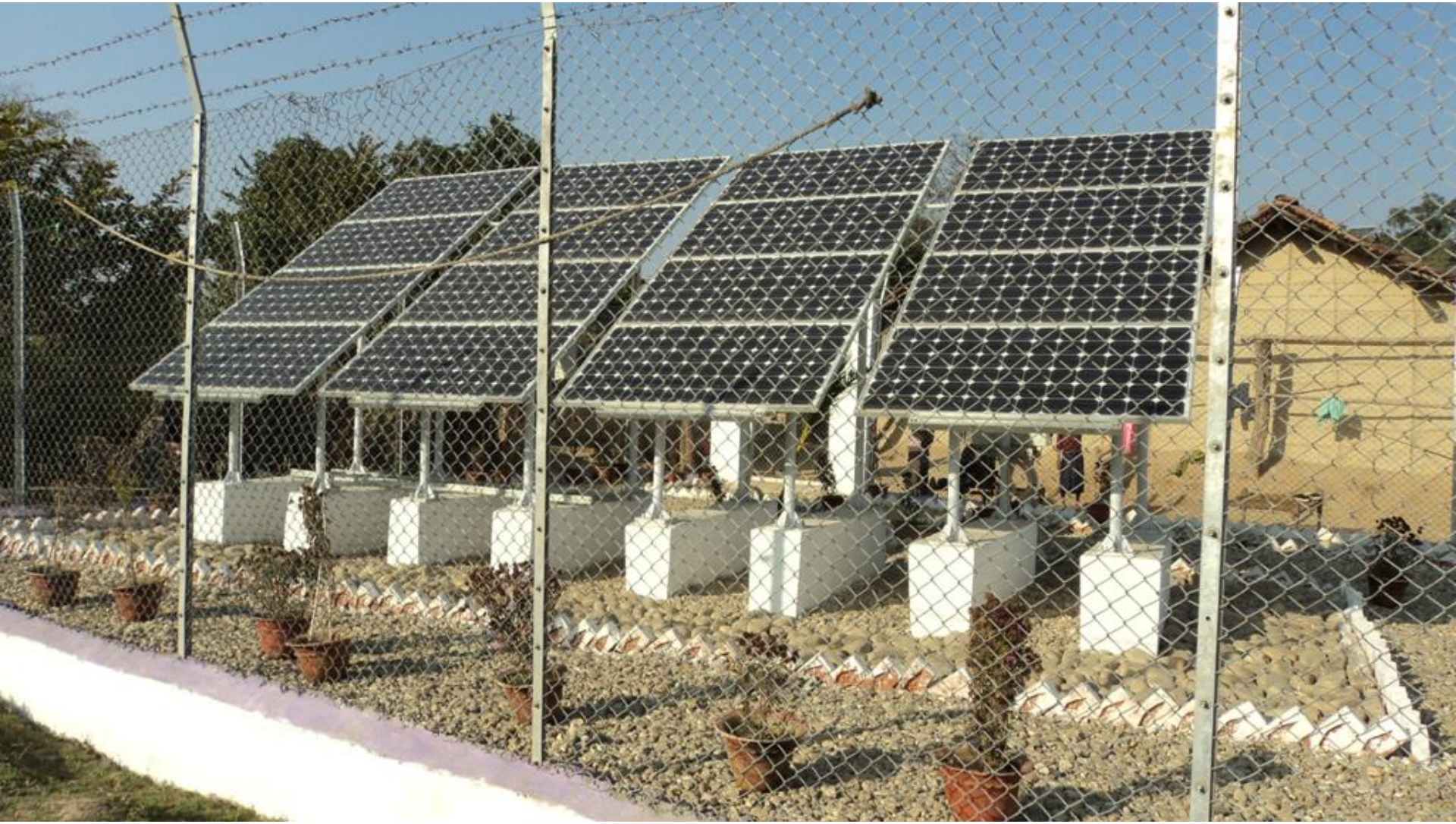








Ncell



Ncell




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