

The IEEE PES Community Solutions Initiative (CSI)

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OUTLINES

- *Introduction: The IEEE PES Community Solutions Initiative (CSI)*
- *PES Chapters' Goals and Strategy*
- *PES Chapters' Resources*
- *PES Regional and Chapter Representatives*

PES Community Solutions Initiative (CSI)

- *The IEEE PES Community Solutions Initiative (CSI) is dedicated to helping IEEE reach the Humanitarian Technology Challenge (HTC) –United Nations (UN) goal of achieving a major impact in global poverty reduction of which energy poverty is a major factor.*
- *The CSI vision emulates the goals of many like-minded groups of building bottom-up community prosperity through training and empowering local entrepreneurs to manage profitable businesses capable of growing to serve a million people in the first 5 years of operation*

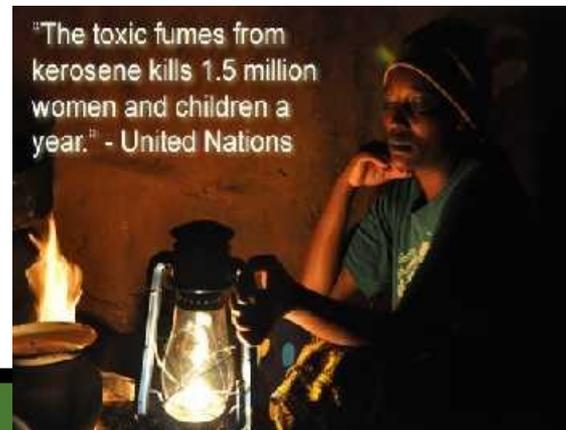
What CSI is doing in Africa now?

- *CSI currently has 3 pre-pilot-projects, each funded by a \$16,667 grant from CSI. Basically, each of the non-governmental organizations (NGO's) are exploring the best way to deploy power to communities far off-grid and very energy poor.*
- *The basic goal of the current pre-pilot project is a review of various power deployment methods and the development of a self-sustaining business model that can then be replicated in other off-grid energy poor communities in Africa.*

Hardware

- It terms of hardware, **we are looking at mini-grids, portable battery kits (recharged at a central charging station) and are considering stand-alone PV battery solutions.**
- At present, each of the NGO partners has on hand some 50 Portable Battery Kits that are being distributed to local village community members for re-charging at a central power station. Two of the NGO's are also operating mini-grids for community-centric metered power provision (at basically less than 1kWh/week per customer).

- **battery pack + light kit instead kerosene fueled "bush lamps"**



CSI NGO Partner Participants

- **Cameroon** –

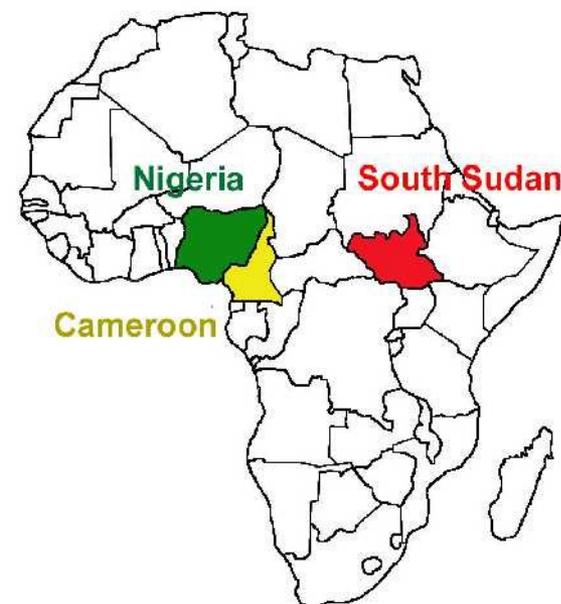
Torchbearer Foundation for Missions,
Reconciliation & Development (TBF)

- **Nigeria** –

Green Valley Electrical Project (GVEP)

- **South Sudan** –

Village Help for South Sudan (VHSS)



NGO Charging Stations

- **All three programs have an existing PV solar array, with station batteries, and related hardware, allowing the addition of portable battery recharging for the CSI field test of PBK deployment.**
- TBF added 750 watts PV capacity to an existing 2kW minigrid & charging station, now expanded to 3.8kW generating 22kWh/day
- VHSS recently completed two community projects,
 - Rhumathoi Community Center 1.5 kW PV
 - Thiou School – 6 kW PV
- GVEP is establishing a new minigrid & charging station with a 6.84kW PV array capable of generating 45 kWh/day.



PBK Hardware

- **TBF - 51 PBKs of 3 capacities**
 - **Phocos AG (Germany/China)**
 - 35 Pico Lights - 2100mAh NiMH
 - **BBOXX**
 - 14 BB5 – 5 Ah Sealed Lead Acid (SLAB)
 - 12 BB17 – 17 Ah SLAB
- **GVEP - 75 PBKs of 4 capacities**
 - **Nextek PBK (USA)**
 - 20 SunBlazer (v1) 18 Ah SLAB
 - **BBOXX (UK/China)**
 - 10 BB5 – 5 Ah SLAB
 - 20 BB7 – 7 Ah SLAB
 - 25 BB17 – 17 Ah SLAB
- **VHSS - 50 PBKs of 1 capacity**
 - **BBOXX (UK/China)**
 - 50 BB17 – 17 Ah SLAB

Pico Light



BBOXX



Nextek



PBK Deployment

- TBF** (Current rate chart for PBK program)

PBK Type	Pico Light	BB5	BB17
Initial Deposit	\$20	\$30	\$50
Weekly Recharge	\$0.50	.80	\$2.40

Pico Light



- GVEP** (Pending delivery of PBKs to deployment site)

PBK Type	Nextek	BB5	BB7	BB17
Initial Deposit	\$38	TBD	TBD	\$38
Monthly Access	\$12.50	TBD	TBD	\$12.50



BB5

- VHSS** (Pending delivery of PBKs to deployment site)

PBK Type	BB17
Initial Deposit	\$10
Monthly Recharge	\$10



BB7



BB17

Present Program Status

TBF – Sabongari, Cameroon

- TBF – PV array and station batteries moved to off-main-street location in May. New power fully commissioned and operating. All PBK hardware cleared customs and in position. Customer subscription started June 26.



Present Program Status

GVEP - Egbeke, Nigeria

- **GVEP – Initial deployment in the first community of Akwa was recently shifted to Egbeke due to late spring 2013 announcement of encroachment of the Nigerian national power grid.**



- **PV array and charging station hardware moved July 2013. Currently waiting for delivery of the BBOXX order which was held up due to shipping documentation issues. BBOXX shipment from China finally cleared June 28th, and delivery of the final hardware is scheduled late-July. First subscriptions of the 75 PBKs available for this program scheduled for mid-August.**

Present Program Status

VHSS – Rhumathoi & Thiou, South Sudan

- **VHSS – Deployment taking place in two villages. Solar PV and charging station batteries, controllers, inverters, etc. completed at the two sites in January.**
 - **Rhumathoi – Community Center - 1.5kW PV array will receive 25 PBKs**
 - **Thiou – Primary School - 6 kW PV installation will receive 25 PBKs.**



- **50 BBOXX PBKs now at the port of Mombassa waiting proper documentation for trans-shipment to deployment sites.**



What do we plan to do in the future?

- **The current pre-pilot project runs for 1 year.** This larger project (late 2014) will introduce into "virgin" villages the complete power deployment model.
- Local operators will be engaged in a for-profit franchise scheme and have at their hands a variety of power deployment options that they can tailor to community needs/conditions....
- Be that a **village center mini-grid, a portable battery and light kit rental program (with centralized recharging) or stand-alone complete solar power solutions for direct home installation.**

...continue

- *CSI has the goal to expand this pilot project "proof of concept" scheme across an additional 6 or 7 NGO partners in other African in 2014... And then engage some 10 new NGO partners world wide each year for a 10 year span.*
- *Once an NGO has demonstrated fully the financially self-sustaining nature of the CSI power implementation project, then they will be in a position to solicit much larger (non-IEEE PES CSI) funding for a full scale initiative to establish a multitude of these small rural power producers across each NGO partner's territory of activity.*

How can the IEEE Sections in Africa help the CSI Mission in Africa?

- *Technical assistance with grassroots problems with program implementation.... Such as protection from lightening, village mini-grid installation practices, business plan development, etc.*
- *Liaison with Government officials and ministries overseeing the power industry in each area of CSI project deployment... Such as advocating customs duties and tax exclusion of renewable power generation hardware importation. Waiver of VAT taxes on renewable power generation systems and sales. . . Help lobby for government support (or removal of encumbrances) for CSI initiatives.*

- *Liaison with the Power Industry . . . This can come in many forms.... Technical assistance, hardware assistance, transportation and communication support, mentoring, sharing of knowledge about grid expansion, help with facilities, etc.*
- *Engaging young people into the CSI power projects . . .*
- *IEEE student members, CSI young ambassadors, engaging in training programs, etc.*
- *Letting us know what programs in your area are doing similar things as what CSI is trying to do.*

(We are aware that there are many similar programs across Africa with groups working to provide modest power to rural off-grid communities. We would love to learn and share with these other initiatives)

Africa is BIG !

The True Size of Africa

A small contribution in the fight against rampant *Immappancy*, by Kai Krause

Graphic layout for visualization only (some countries are cut and rotated)
But the conclusions are very accurate: refer to table below for exact data

COUNTRY	AREA x 1000 km ²
China	9.597
USA	9.629
India	3.287
Mexico	1.964
Peru	1.285
France	633
Spain	506
Papua New Guinea	462
Sweden	441
Japan	378
Germany	357
Norway	324
Italy	301
New Zealand	270
United Kingdom	243
Nepal	147
Bangladesh	144
Greece	132
TOTAL	30.102
AFRICA	30.221



Top 100 Countries

Area in square kilometers, Percentage of World Total
Sources: Britannica, Wikipedia, Almanac 2010

	AREA km ²	%	
1	Russia	17.098.242	11,50
2	Canada	9.984.670	6,70
3	China	9.596.961	6,40
4	United States	9.629.091	6,40
5	Brazil	8.514.877	5,70
6	Australia	7.692.024	5,20
7	India	3.287.283	2,30
8	Argentina	2.780.400	2,00
9	Kazakhstan	2.724.900	1,80
10	Sudan	2.505.813	1,70
11	Algeria	2.381.741	1,60
12	Congo	2.344.858	1,60
13	Greenland	2.166.086	1,50
14	Saudi Arabia	2.149.690	1,40
15	Mexico	1.964.375	1,30
16	Indonesia	1.860.360	1,30
17	Libya	1.759.540	1,20
18	Iran	1.628.750	1,10
19	Mongolia	1.564.100	1,10
20	Peru	1.285.216	0,96
21	Chad	1.284.000	0,86
22	Niger	1.267.000	0,85
23	Angola	1.246.700	0,85
24	Mali	1.240.192	0,83
25	South Africa	1.221.037	0,82
26	Colombia	1.141.748	0,76
27	Ethiopia	1.104.300	0,74
28	Bolivia	1.098.581	0,74
29	Mauritania	1.025.500	0,69
30	Egypt	1.002.000	0,67
31	Tanzania	945.087	0,63
32	Nigeria	923.768	0,62
33	Venezuela	912.050	0,61
34	Hambia	824.116	0,55
35	Mozambique	801.590	0,54
36	Pakistan	796.095	0,53
37	Turkey	783.562	0,53
38	Chile	756.102	0,51
39	Zambia	752.612	0,51
40	Myanmar	676.578	0,45
41	Alghanianst	652.090	0,44
42	Somalia	637.657	0,43
43	France	632.834	0,43
44	C. African Rep	622.984	0,42
45	Ukraine	603.500	0,41
46	Madagascar	587.041	0,39
47	Botswana	582.000	0,39
48	Kenya	580.367	0,39
49	Yemen	527.968	0,35
50	Thailand	513.120	0,34
51	Spain	505.992	0,34
52	Turkmenistan	488.100	0,33
53	Cameroon	475.442	0,32
54	Papua New Guinea	462.840	0,31
55	Uzbekistan	447.400	0,30
56	Morocco	446.550	0,30
57	Sweden	441.370	0,30
58	Iraq	438.317	0,29
59	Paraguay	408.752	0,27
60	Zimbabwe	390.757	0,26
61	Japan	377.930	0,25
62	Germany	357.114	0,24
63	Rep o.c. Congo	342.000	0,23
64	Finland	338.419	0,23
65	Vietnam	331.212	0,22
66	Malaysia	330.800	0,22
67	Norway	323.802	0,22
68	Côte d'Ivoire	322.463	0,22
69	Poland	312.685	0,21
70	Oman	309.500	0,21
71	Italy	301.336	0,20
72	Philippines	300.000	0,20
73	Burkina Faso	274.222	0,18
74	New Zealand	270.467	0,18
75	Gabon	267.668	0,18
76	Western Sahara	266.000	0,18
77	Ecuador	256.369	0,20
78	Guinea	245.857	0,17
79	United Kingdom	242.900	0,16
80	Uganda	241.038	0,16
81	Ghana	238.539	0,16
82	Romania	238.391	0,16
83	Laos	236.800	0,16
84	Guyana	214.969	0,14
85	Belarus	207.600	0,14
86	Kyrgyzstan	199.951	0,13
87	Senegal	196.722	0,13
88	Syria	185.180	0,12
89	Cambodia	181.035	0,12
90	Uruguay	178.215	0,12
91	Suriname	163.820	0,11
92	Tunisia	163.810	0,11
93	Nepal	147.181	0,10
94	Bangladesh	143.998	0,10
95	Tajikistan	143.100	0,10
96	Greece	131.957	0,09
97	Nicaragua	130.373	0,09
98	North Korea	120.538	0,08
99	Malawi	118.484	0,08
100	Eritrea	117.600	0,08
TOP 100 TOTAL	132.632.524	89,34	



In addition to the well known social issues of *illiteracy* and *innumerycy*, there also should be such a concept as "*immappancy*", meaning *insufficient geographical knowledge*.

A survey with random American schoolkids let them guess the population and land area of their country. Not entirely unexpected, but still rather unsettling, the majority chose "1-2 billion" and "largest in the world", respectively.

Even with Asian and European college students, geographical estimates were often off by factors of 2-3. This is partly due to the highly distorted nature of the predominantly used mapping projections (such as *Mercator*).

A particularly extreme example is the worldwide misjudgement of the true size of *Africa*. This single image tries to embody the massive scale, which is larger than the *USA, China, India, Japan* and *all of Europe..... combined!*

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PES Chapters Goals

- *Increase the number of PES chapters to expand the PES presence worldwide;*
- *Increase the number of volunteers;*
- *Develop the PES Chapters leadership base by training successors and passing leadership skills onto the next generation*

The PES Chapters' Resources

- ***Distinguished Lecturer Program (DLP)***

(provides support to PES Chapters so that they can develop interesting and informative technical programs for their members, and increase the educational awareness of the PES general membership on a variety of topics with perspectives ranging from research to the practical application of technology interesting and informative technical programs for their members)

- ***PES Chapters' AWARDS:***

- High Performance Chapter Program (HPCP)
- Outstanding Chapters Award (OCA)
- Membership and WEBSITE Contest
- Outstanding Engineer Award (OEA)

PES Chapters website link <http://www.ieee-pes.org/pes-communities/chapters>

- **Publications**
- **Chapter Chairs Training**
- **Chapter Leadership Luncheons**
- **Travel Grants**
- *Increase participation of the IEEE sections/PES chapters in PES Conferences / Symposiums in addition to regular chapter's technical meetings and events*
- *Increase our participation in WIE*
- *Increase our participation in promoting PES among High school students*

- *Form PES chapters in the section where we significant number of PES members (Zambia, Ghana, Bulgaria)*
- *PES shall favour the potential conference to the chapters and their volunteers who will do it for the good of the society and PES visibility*
- *Look for the conference location where IEEE/PES have interest*
- ***PES Africa Power Conference** should be rotated in the region: for instance North Africa (Algeria, Morocco?)*
- *Participates at IEEE student congresses which includes WIE sessions*

Additional Info

- Free PES Dues for IEEE Student Members
- On-line processing

<http://www.ieee-pes.org/images/pes-communities/First-Year-Free-Student-Membership.pdf>

Where to go for help ?

- PES Chapters at
- <http://www.ieee-pes.org/pes-communities/chapters>
- *Meliha B. Selak, VP Chapters (2013) : melih@ieee.org*
- *Region and Chapter Representatives at*
<http://www.ieee-pes.org/pes-chapters-organization>
- PES and IEEE Staff
 - *Pat Ryan, PES Executive Director: p.ryan@ieee.org*

Regional & Chapter Representatives

- **PES Regional Representatives for each Regions**
 - Regional Representatives (RR) are nominated by the Vice-President of Chapters to the PES President and appointed by PES Board
- **Chapter Representatives**
 - The RR with the approval of the VP Chapters selects and appoints Chapter Representatives (CR)

PES Chapters Organization in Reg8

Region 8 is divided in 5 areas covering Europe, Middle East and Africa. There are presently 45 chapters in Region 8 (some of them jointly with other societies)

PES Reg8 Regional Representative:

Costas Vournas vournas@power.ece.ntua.gr

PES Reg8 Chapter Repepresentatives:

- **Africa: Pat Naidoo** pat@patnaidoo.co.za

(4 chapters: Nigeria (T. Wudil), South Africa (P. Naidoo), South Africa Joint IE/PE/IA/PEL (R.Wilkinson), Mauritius (K. Seeburn).

- *Western Europe:* Dirk Van Hertem dirk.vanhertem@ieee.org
(9 chapters: Austria (M. Muhr), Benelux (D. Van Hertem), France (S. Henry), Germany (I. Erlich), Italy (D. Lucarella), Portugal (J.A. Peças Lopes), Spain (L. Rouco), Switzerland (K. Brand), United Kingdom and Ireland (A. Keane)
- *Central and North Europe:* Igor Kuzle igor.kuzle@fer.hr
(10 chapters: Bosnia Herzegovina (E. Becirovic), Croatia (I. Kuzle), Czechoslovakia (I. Petruzela), Denmark (J. Ostergaard), **Finland (K. Zenger)**, Hungary (L. Jermendy), Norway (G. Dooman), Poland (D. Rasolomampionona), Slovenia (A. Gubina); Sweden (L. Bertling).)

Red marked chapter will be dissolved in November.

- **Eastern Europe: Anastasios Bakirtzis** bakiana@eng.auth.gr
(11 chapters: Cyprus (E. Kyriakides), Macedonia (S. Cundeva), Greece (A. Bakirtzis), Israel (D. Shmilovitz), Romania (M. Eremia), Russia-Northwest (Y. Danilevich), Russia-Siberia (V. Kurbatsky), Russia-Moscow (Y. Rozanov), Serbia and Montenegro (Z. Radojevic), Turkey (O. Usta), Ukraine (A. Yandulsky).
- **Middle-East : Bander Allaf** bander@ieee.org
(11 chapters: Bahrain (M. Habib Taleb?), Egypt (S. El Debeiky), Jordan (N. I. Tawalbeh), Lebanon (W. Kamali), **Libya (B. Jomaa)**, **Oman (T. Al-Khusaibi)**, Saudi Arabia (G.Dandan ?), West Saudi Arabia (B. Allaf), **United Arab Emirates (F. Al Dhaheri)**, Tunisia (I. Ben Salah), Algeria (M. Boudour))

Red marked chapter will be dissolved in November.

Please reactivate your chapter

- **First, ask chapter chairs to submit the missing L-31 Forms.**
- **At second, maybe it would be useful to make changes in the Chapter Chair positions.** According to the IEEE rules, officer election is requested annually and it is recommended to make rotation in the position of the Chapter Board bi-annually. A new and dynamic chapter chair would be useful, possibly.

RRs & CRs duties

RRs and CRs jointly with VP Chapters:

- Provide guidance and support to the Chapters
- Build database containing all PES Chapters and Chapter chairs
- Organize Chapter Chair Meetings
- Help to establish new Chapters