- Electrification
- Education Access
- Enterprise Development

IEEE smart village™
Empowering Off-Grid Communities

IEEE

IEEE Smart Village

Power a Village, Empower Community

STANFORD IDEAL VILLAGE CONFERENCE SEPT 30, 2021

John Nelson, President IEEE Smart Village

"Power a Village, Empower A Community"

The 3 Pillars of IEEE Smart Village

Mission

- IEEE Smart Village integrates sustainable electricity, *education*, and *entrepreneurial solutions* to empower off-grid communities

Vision

- A world where all people enjoy equal access to electricity and education to grow opportunities and leverage change for themselves and others

ISV Project Locations

RGU GRA SCF HIS BCF

The Americas
- Galapagos (Ecuador)
- Haiti
- Honduras
- United States

IA GVE AGC SNL REIc DCN VHSS ADP RSVSV MAA HHE RDO LCS WET CEM TBS

Africa
- Cameroon
- Kenya
- Malawi
- Namibia
- Nigeria
- South Sudan
- Rwanda
- Tanzania
- Uganda
- Zambia

GHE SSC NEP IITM SES SBI CSA PLI FGU NCTU

Asia
- India
- Nepal
- Papua New Guinea
- Vietnam

Retired
Active
Future

87 Projects funded in 18 Countries since 2009

Currently 16 Active Projects in 9 Countries - Cameroon, Ecuador (Galapagos), Honduras, India, Kenya, Nigeria, Rwanda, USA, Vietnam

Renewable Energy Innovators - Cameroon (REI-c)

THE PROBLEM In Cameroon

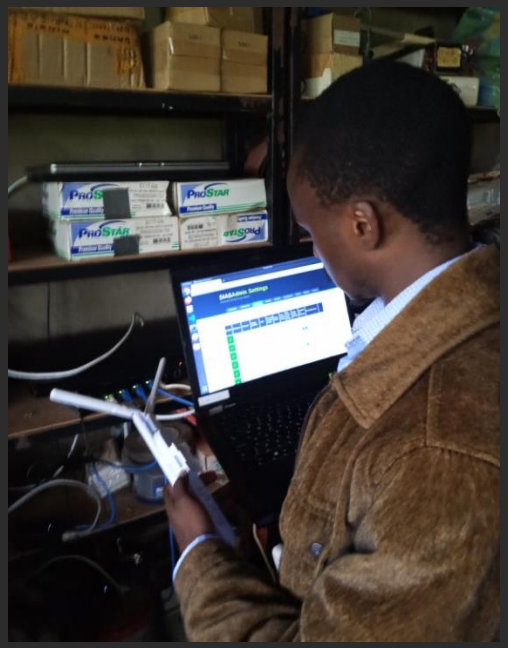
- More than 10,000 villages without electricity
- 8 million people live below poverty line @ $1.50 a day

*The Electricity Solution: SunBlazer**

- Deploy *REI-c adapted** SunBlazers, scalable, smart, standardized solar mini-grid PV generator modules
- Power off-grid homes, businesses, schools, hospitals
- Scalable to 100kW

* F4th Generation design by ISV Technical Committee since 2011

REIc Education Solution: Local WIFI for Training Classrooms



High quality Ubiquity radios

REIc Ed Easy Platform

ISV Entrepreneur - India
Global Himalayan Expedition

GHE

Using the power of Ecotourism to transform Mountain Communities

- 2015 $35K – Electrification of 5 Remote Himalayan Villages
- 2016 $65K –NatGeo TV 1-hour documentary "*Power to the People*" globally distributed in 64 languages
- 2017 – Winner World Tourism Forum Lucerne Award
- 2018 – Winner of World Travel and Tourism (WTTC) Award
- 2019 – G20 Sustainable Tourism Startup Award

- To date: Electrified more than 150 villages in 3 regions of India; impacting 65,000+ villagers. Installed 1.1MW of solar power; mitigating 8,954 Tons of CO2 emissions annually
- Established 17 digital "Innovation Centers" bringing global education to the mountains; Strengthened village primary health centers with solar power & basic medical equipment
- Setup 80 Traveler Homestays across 50 villages in Himalayas; reservations globally now directly through Airbnb and Booking.com

Precious Stones Project – Kuumba (Creativity) Smart Vision - Zambia

KSV-Zed is based on "Women empowering women to empower the world"

The Team

- IEEE Smart Village
- MOU/Ministry of Ed
- MOU/Kariba Minerals
- Local Lapidary School

KSV-Zed Progress

- Launched early August 2021 with six trained graduates participating , 4 females , 2 males
- Goal was to have 50 pieces cut out of 325 grams of amethyst.
- A total of 78 stones were cut and polished totaling over 200 carats*
- Received 36 stones in the US

* 1 carat = 0.2 grams

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Covid-19 Crisis In Africa & India

Issues

- Lack of Vaccines – Nigeria 3%, Cameroon 1.% , India 50% first dose as of 9/30/21
- Lack of care facilities, beds, personnel
- Food shortages
- Illness and death expected to grow

Business Impacts

Possible violence some areas , theft, requires relocation & Travel Restrictions

Conferences Virtual, SV Meetings virtual since inception so not a major issue

First Projects with Rotary International

Improving Health, Sanitation, and Economic Conditions of Kawolo, Kyangwali and Kiyindi in Uganda

IEEE
Advancing Technology for Humanity

ROTARY INTERNATIONAL

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Global Telehealth Network

Collaboration
&
Leveraging

IAS IEEE INDUSTRY APPLICATIONS SOCIETY
Linking Research to Practice

pcic®
IEEE-IAS PETROLEUM AND CHEMICAL INDUSTRY COMMITTE

Team Project Leveraging GTN, RI

ISV team project – LEVERAGING $20,000

IEEE Smart Village(ISV), Global Telehealth Network(GTN) & Rotary International

Leveraging: Uganda ISV-Telehealth Project

- IEEE Smart Village ($20,000)
- The Rotary Foundation ($35,750)
- Rotary Club of Mengo (Kampala, Uganda) ($10,000)
- Rotary District 9211 via DDF ($20,000)
- Rotary Club of Los Altos (California, USA) ($5,000)
- Rotary Club of Branson-Hollister (Missouri, USA) ($2,500)

Total of $93,250 to Develop a reliable Telehealth network; stable power; stable *internet/ intranet* access

Uganda Telehealth - 5 Solar Systems

Kawolo Hospital (3), Kyangwali Refuge Camp(1) & Kiyindi Landing (1)

Solar PV Panels (7.2 kilowatts total):

- Two sets of eight 300 Watt/24 Volt:
  Total of Two 2400-Watt Systems
- Three 3 sets of four 200 Watt/12 Volt:
  Three 800-Watt Systems

Inverters: (6.7 kilowatts total):

- 2 Systems @ 2000 Watts 24 V input
- 3 Systems @ 900 Watts 12 V input

Battery Systems (33.6 kWh total):

- Two Systems @ 400 Amp hour /24 V system: 9.6 kWh each
- Three Systems @ 400 Amp hour/12 V systems: 4.8 kWh each

Cumulative Achievements – Feb 2021

Direct ISV Funding – *Seeding Entrepreneurs*

- 190 Stand-alone deployment sites initiated
- 87 projects in 18 countries since 2009
- 16 Active projects in 9 countries

Leveraging – *ISV Incubation Leads to Scaling*

- 6,346+ PV Solar Panels installed producing over 2000 KW *
- 41.04 MWh of installed energy storage *
- 62,429 Customer Connections
- 187,974 Currently receiving the benefits of power
- 5,033 Connections to productive uses of power
- 628+ New business start-ups since arrival of power
- 1.35+ Million people under transformation to receive power

Going to Scale

Key is Leveraging

Numbers are the cumulative sum of ISV + 3rd party funded programs

* Outlier: GVE 4,000 panels & 38.5 MWh storage

Updated February 2021


Lingshed Monastery
Ladakh Region, Indian Himalayas
Established in year 1440 at an elevation 12,000 feet
Remains brightly lit to this day thanks to
IEEE Smart Village's 2016 project with local developer
Global Himalayan Expedition
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