

POWERING UP AFRICA

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OUR STORY SO FAR

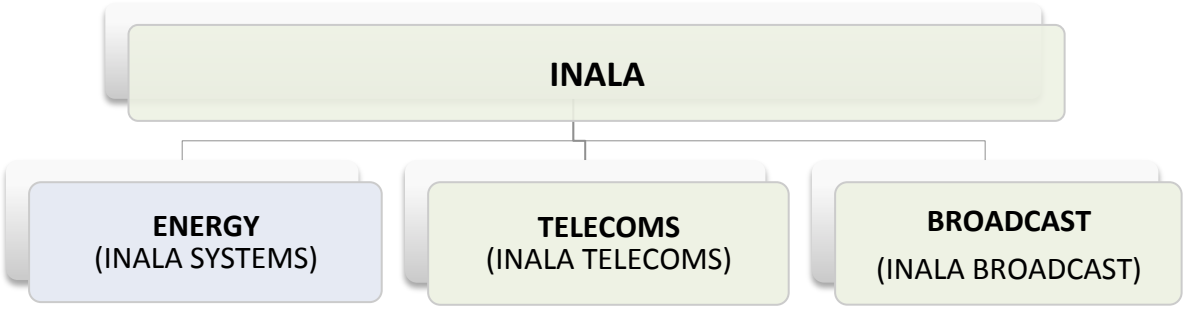
- Established track record in Emerging Markets, founded in 1996
- Focused on the Telecoms and Energy sectors
- Active deployments in 25 African countries, India, Indonesia and the Middle East
- Strong investor base experienced in investing in Africa and Europe
- 10 years of profitable growth
- Turnkey solutions provider to :
  - 18 Global Mobile Operators
  - 3 Tower Companies
  - 7 Broadcasters
  - Numerous Corporates



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INALA ENERGY



INALA SYSTEMS own, develop and deploy turn-key energy control and optimization solutions to Telecoms Operators and other distributed energy users.

- Integrated Energy Management and Optimization
- Hybrid Energy Control and Management
- Site Asset Management, Reporting and Control
- Turn key renewable and off grid energy solutions

helios towers
warid
vodafone
airtel
MITSUBISHI ELECTRIC
Changes for the Better
MTN
telecel
orange
vodacom

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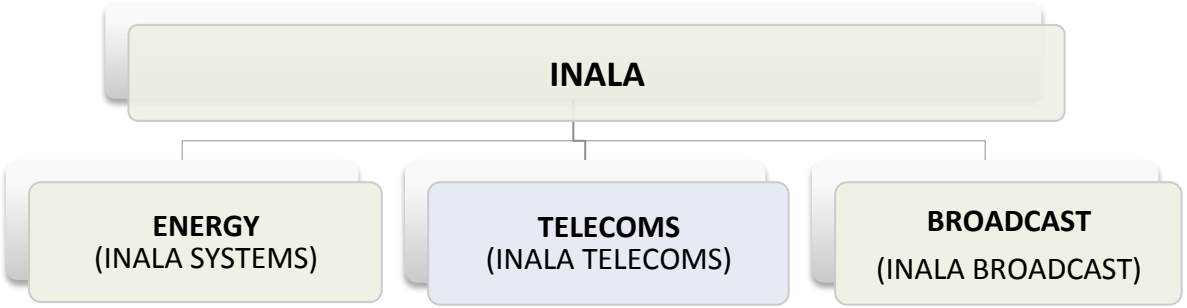
INALA ENERGY TRACK RECORD

- Inala has deployed in excess of 26 000 energy management solutions across Africa, India, Indonesia and the Middle East.
- Successful deployments of turnkey hybrid energy solutions in remote and extreme environments.
- Long-term framework agreements for the supply and maintenance of energy management solutions.
- Ongoing innovation and refinement of the solution offering, market and product thought leadership.

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INALA TELECOMS



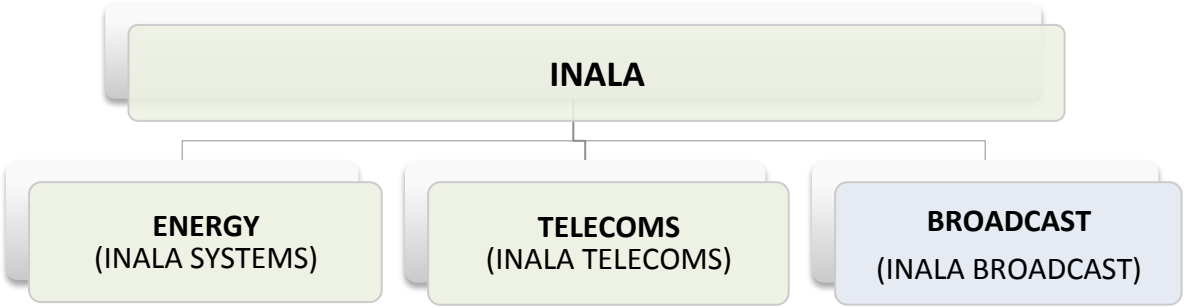
INALA TELECOMS offer turn-key telecoms solutions to Operators in Africa

- Network Quality Improvements
- Network Optimization
- Coverage Enhancement
- IP Network Management
- Fiber Optic Deployments
- Quality Assurance
- Test and Measurement

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INALA BROADCAST



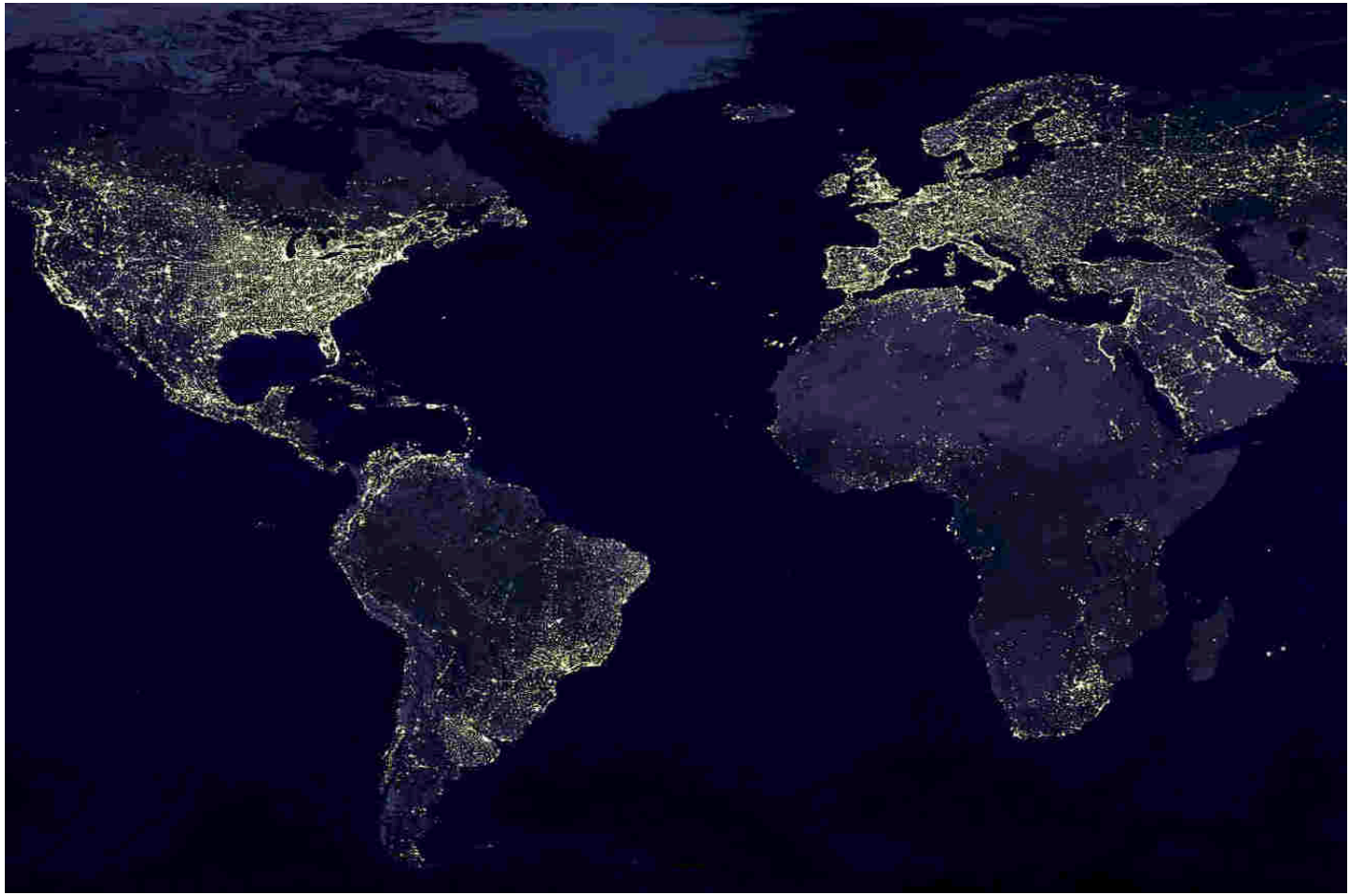
INALA BROADCAST offers turn-key broadcasting solutions to Public Broadcasters

- System Architecture / Design
- Digital Terrestrial Transition
- HD studio design and deployment

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DARKEST AFRICA?

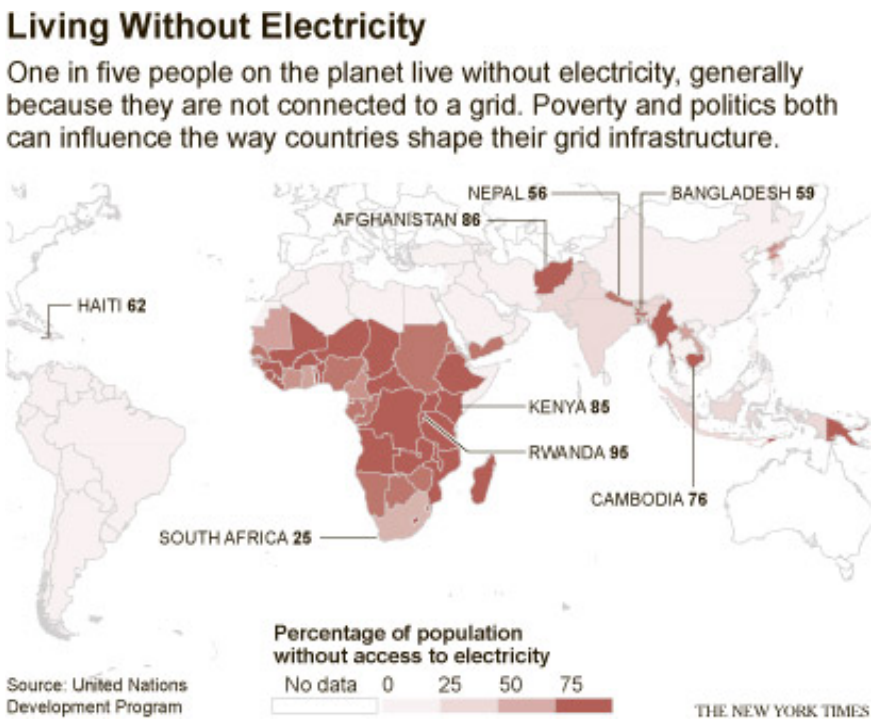




ENERGY SUPPLY IN EMERGING MARKETS

Access to reliable electricity supply :

- 1.5 Billion people live without access to electricity
- 30% of Sub-Saharan population has access > 8 hours a day
- 14.5% of rural Sub-Sahara population have access > 4 hours a day





ESCO'S AND ENERGY COMPANIES

- Traditional models have few, large scale electricity generation entities with extensive distribution infrastructure delivery electricity to consumers
- ESCO – Energy Services Companies – offers a localized generation, supply and management of electricity, independent from or connected to the large generation entities
- ESCO's make use of a combination of different energy sources – Grid, Generators, Solar, Wind, Biogas, Micro-hydro, Fuelcells, Geothermal and Gas Turbines
- ESCO's distribute energy on a kW/h basis directly to consumers, either pre or post paid and own the end to end energy value chain

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THE AFRICA EMESCO OPPORTUNITY

- Mobile operators and Tower companies require energy to be able to deliver their services – they are forced to invest in this directly but is more than willing to outsource energy generation and supply to an ESCO as they deem energy to be non-core
- The telecommunication industry' demand for reliable off grid energy suppliers in emerging markets is thus the catalyst to the launch of an African ESCO, or Emerging Market ESCO (EMESCO)
  - 75 000 new off grid sites in emerging markets 2012
  - 60 000 in Africa over the next 5 years to connect 400m rural subscribers
- Inala has successfully delivery commercially viable energy solutions to clients on over 26 000 sites, both for off grid and unreliable grid requirements.
- Advances in technology, economy of scale in deployment and knowledge of local conditions thus position Inala ideally to service the demand for an African ESCO, or EMESCO



THE TRUE SIZE OF AFRICA

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 km²
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**



In addition to the well known social issues of *illiteracy* and *innumeracy*, 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!*

Top 100 Countries

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

		AREA km²	%
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	3.287.263	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	0,86
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	1.025.520	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	Namibia	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	Afghanistan	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	406.752	0,27
60	Zimbabwe	390.757	0,26
61	Japan	377.930	0,25
62	Germany	357.114	0,24
63	Rep o.t. Congo	342.000	0,23
64	Finland	338.419	0,23
65	Vietnam	331.212	0,22
66	Malaysia	330.803	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	176.215	0,12
91	Suriname	163.820	0,11
92	Tunisia	163.610	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











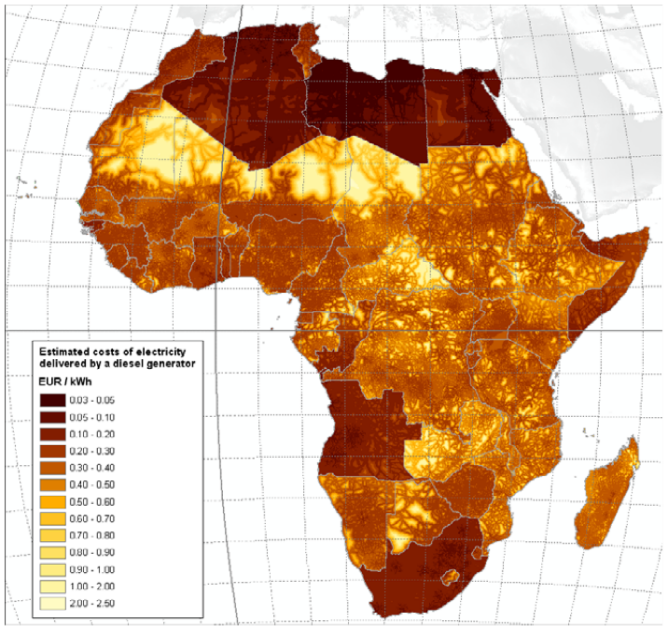
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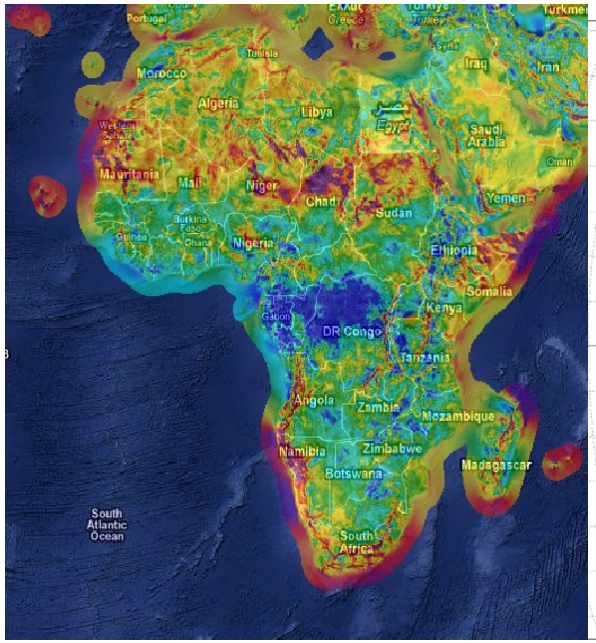
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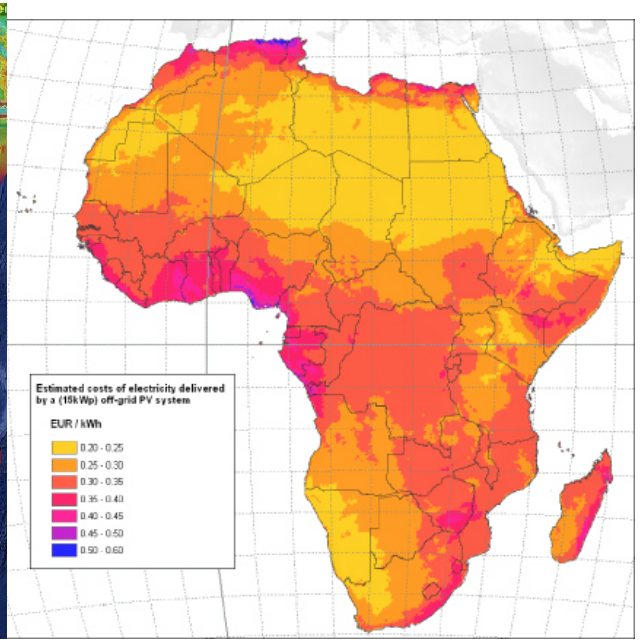




EARTH WIND AND FIRE







Diesel

Wind

Solar

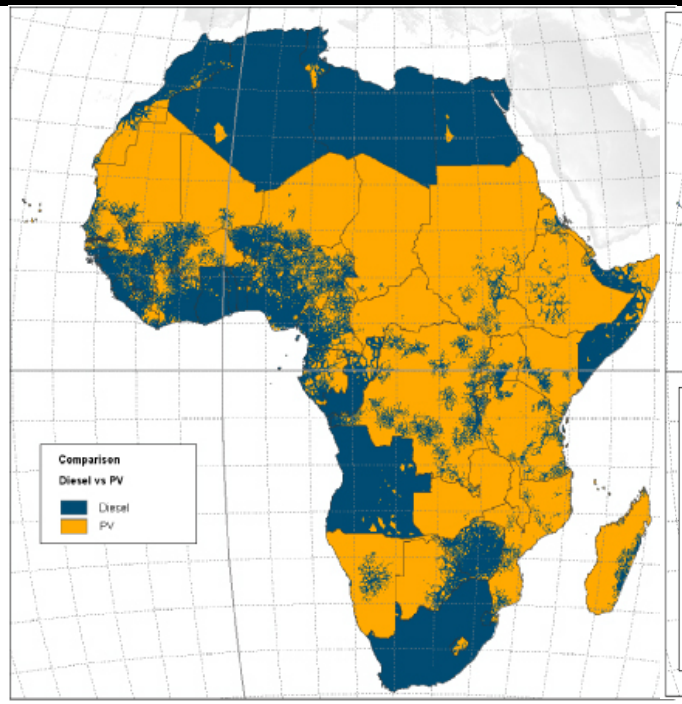
Environ. Res. Lett. 6 (2011) 034002; S Szabo, K Bodis, T Huld and M Moner-Girona

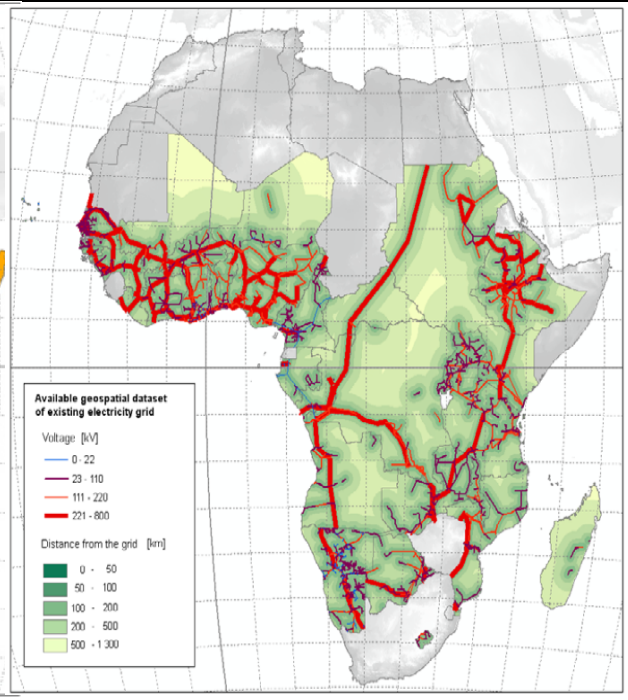
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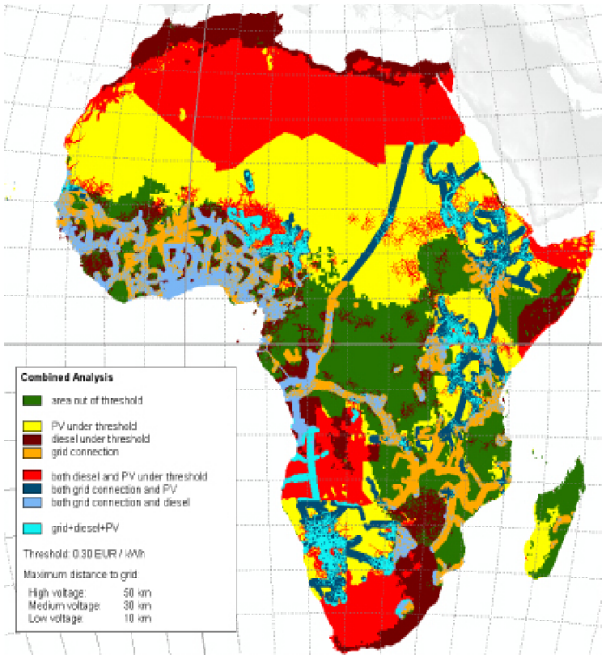




ENERGY SOURCE FEASIBILITY







Solar / Diesel

Grid Electricity

Grid / Solar / Diesel

Environ. Res. Lett. 6 (2011) 034002; S Szabo, K Bodis, T Huld and M Moner-Girona



TECHNOLOGY CHOICES

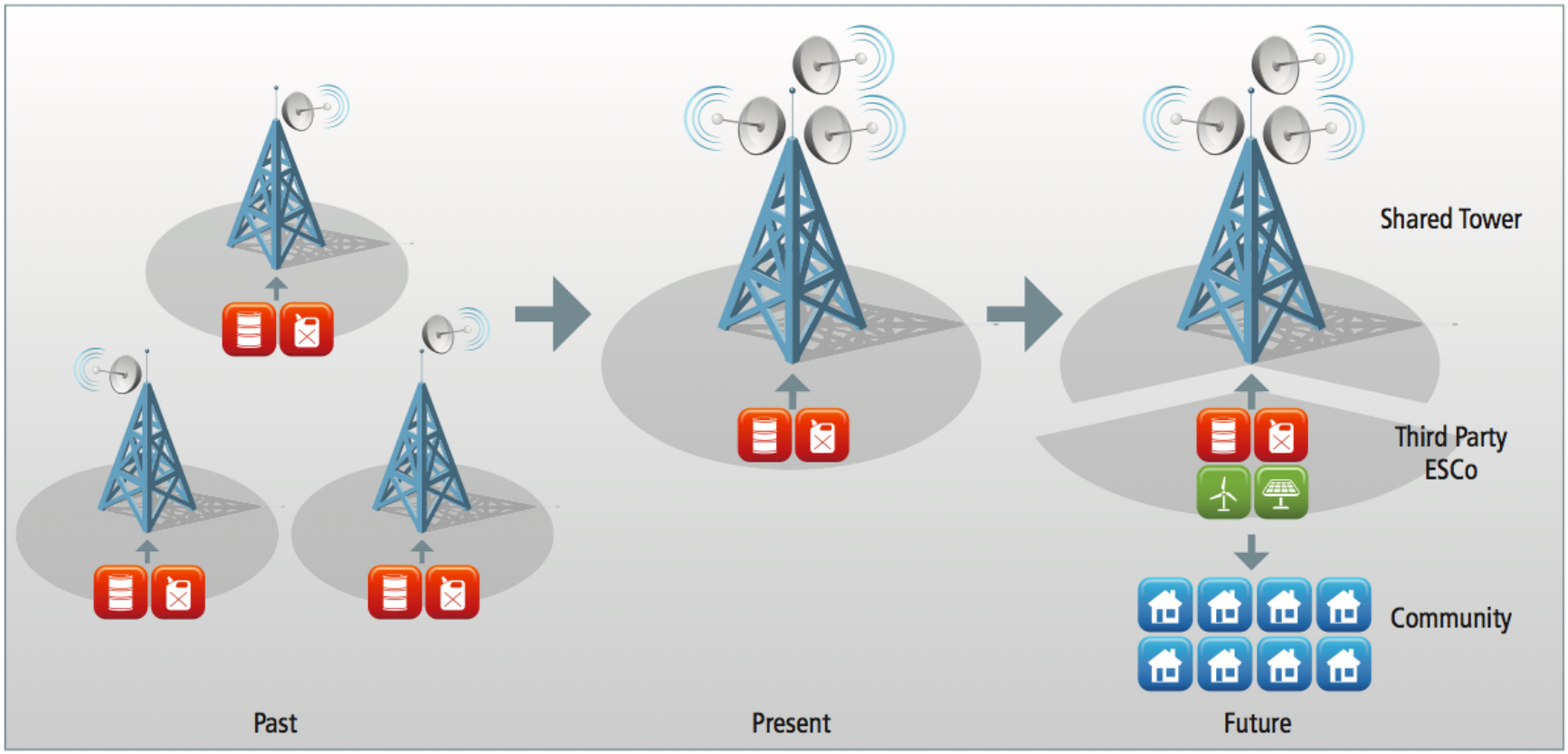
	Diesel (BTS Only, No Community Power)	Wind with Diesel Backup	Biomass Gasification (Vegetation) with Diesel Backup	Biodigester (Manure)	Pico Hydro with Diesel Backup	Solar PV with Diesel Backup
Power Output	5kW – >100kW	<1kW - >100kW	3kW – >100kW	1kW – >100kW	<1kW - 100kW	Scalable
Asset Lifetime	3 years	20 years	10-15 years	20-30 years	25-30 years	20-25 years
Maturity	Very mature – widely used	Established	Mature	Mature	Lacks commercial maturity	Price points declining rapidly
Requirements	Diesel supply chain	Wind speeds 5m/s for >50% of year	Large volumes of vegetation feedstock ≈ 50 hectares worth of crops	High concentration of collectable manure e.g. a dairy with 500 cows	Stream with a head of 60m and flow of 100l/s year round	Insolation >5kWh/m^2/day
Reliability of Energy Source	High, but dependant on distribution partners	Wind speed is unreliable	Subject to harvest	Dependent on local buy-in and incentivisation	Consistent and predictable	Some variation, depending on location
Advantages	Tried and tested technology Skills available for maintenance	Relatively cheap, low maintenance	Can use products that would otherwise be wasted, generator also runs on diesel	Manure is cheap and locally sourced, generator also runs on diesel	Small OPEX, constant supply of power, low maintenance	Very little maintenance
Disadvantages	High carbon footprint, fuel is expensive and volatile, needs regular maintenance	Variability in wind speed is hard to gauge	Supply chain of fuel may break down if farmers have more lucrative land uses, fuel crops could compete with food crops	Fuel supply may run out, dependent on local supply chain	Very few suitable sites	Expensive at scale, risk of theft

Source: GSMA Research

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EVOLUTION OF THE EMESCO MODEL



SOURCE: GSMA COMMUNITY POWER REPORT 2010



THE EMESCO PROPOSAL

- A turnkey, standardized, pre-configured “micro grid” energy supply unit, rated at 15kW, 35kW and potentially 50kW with 12 hours autonomy servicing a 1km radius from base of deployment
- A tiered level of energy supply service agreements to different commercial clients : Telco’s, Financial Institutions, Health, Education, Entrepreneurs and Community through a managed utility pricing infrastructure, both pre and post paid
- A business partnership with in country partners for service, maintenance and supply chain management



THE CLIENT VALUE PROPOSITION

- **Telco's** : Outsourcing of energy requirements to EMESCO reduce operational complexity
- **Health** : reliable energy in rural areas increase service delivery and reduce operational complexity
- **Education** : extend reach of services and community participation in programs
- **Financial Institutions** : increase service delivery and reduce security risk on rural sites
- **Entrepreneurs** : New services offered, payment mechanisms secured, access to clients and market information
- **Community** : Commerce, Security, upliftment, growth



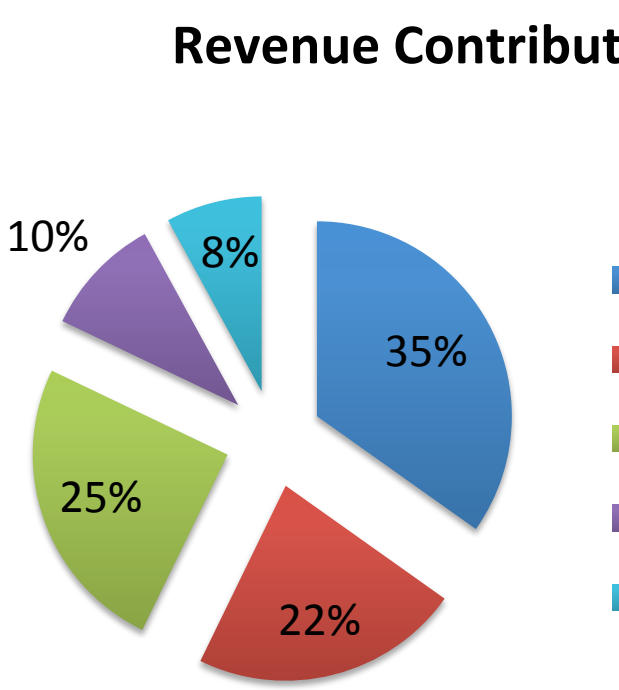
COMMERCIALS AND FEASIBILITY

- Factors impacting on commercial model:
  - Price of diesel and grid supply increasing annually
  - Energy demand of Telco equipment decreasing
  - Renewable energy generation reducing in price / kWh
  - Short distance distribution network reduce losses
  - Demand side management smooth energy peak demand loads
- Higher electrical efficiency to centralized electricity generation
- Long term takeoff agreements with Telco's and commercial clients
- Regulatory Environment differs in each country
- Ensuring community participation and support critical
- Site selection and supporting SCM and logistics determines economic feasibility

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REVENUE CONTRIBUTION



- Telco revenues remain the anchor even with improvement in energy efficiencies of active equipment as energy supply priced at premium with high level SLA's
- Commerce the second biggest contributor as businesses establish and grow
- Community revenue softened by demand side management discounting
- Financial Services / Banks / Health and Education will remain smaller as these are in support of other revenue generators

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COMMERCIAL RISK AND MITIGATION

- Risks impacting on EMESCO:
  - Price of diesel remain a significant cost driver in the model
  - Supply chain costs and management of fuel distribution and security of supply chain
  - Regional political instability
  - Revenue collection and management of diverse client base
  - SLA penalties on failure to deliver to contracted standards to premium clients
  - Technology lifecycle costs, repair and replacement charges

- Risk mitigation strategies :
  - Increased reliance on new and improved renewable energy sources
  - In country partnerships with supply chain service providers
  - Community involvement and participation in site management and security
  - Asset monitoring and management policies and procedures
  - Active technology lifecycle management for optimum Total Cost of Ownership and financial returns



IN CLOSING

"Off-grid is the answer for the poor. But people who control funding need to see this as a viable option."

Minoru Takada : UN Sustainable Energy Development Program



THANK YOU