



**Do Rural small scale  
renewables provide a  
solution to energy poverty?**

I will demonstrate that the answer is : YES



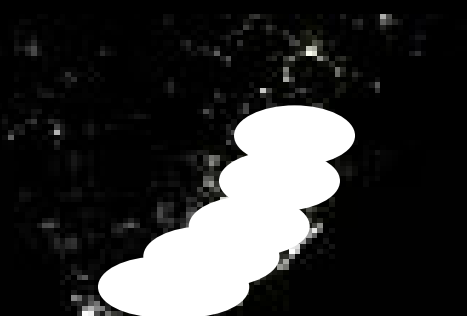
Do small scale renewables provide a solution to providing rural areas with the energy solutions they require to improve their lives - not just to have power, but to have sufficient power to enable health services, education and businesses to be run effectively.

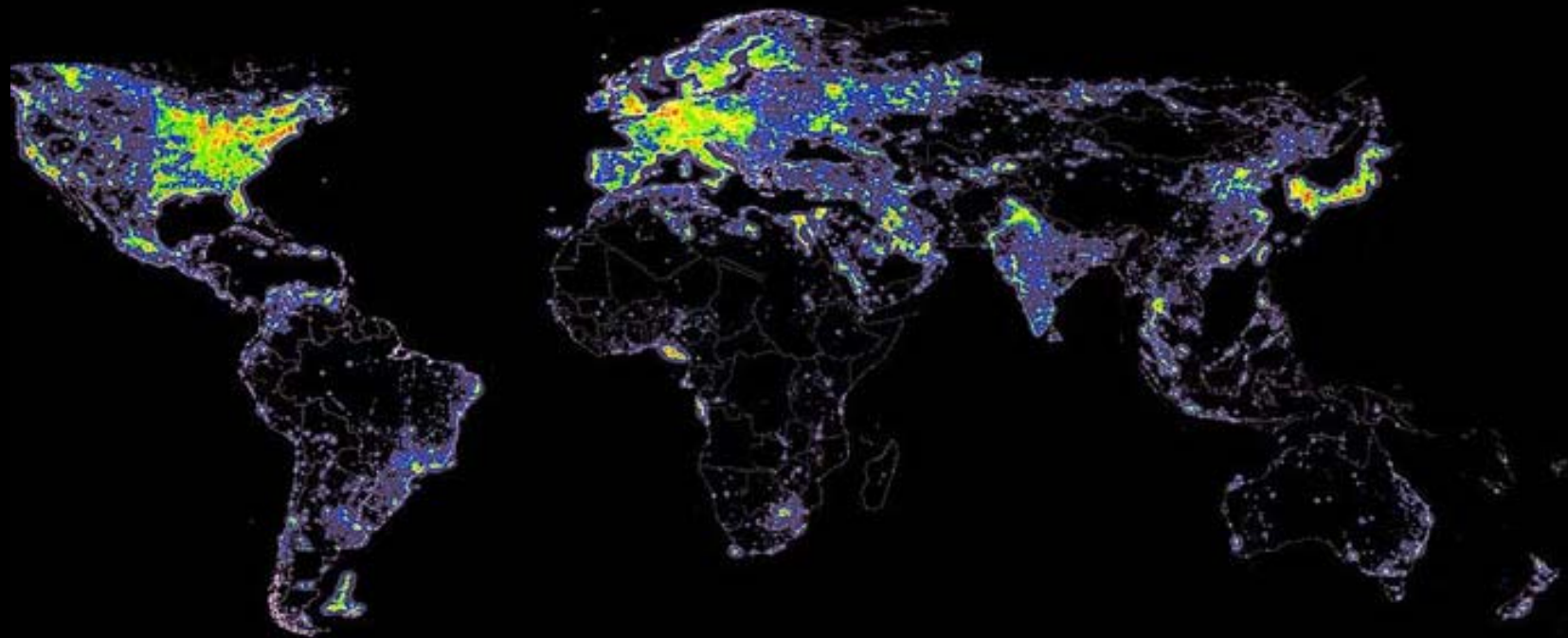
**Poverty:** A certain level of material deprivation below which an individual suffers physically, emotionally and socially. There are a number of methods of determining this level of deprivation.

**Africa is the dark continent !  
1 billion people  
generates only 4% of global electricity  
Over 50% of that is used by South Africa !  
Only 15% of the population in Africa has electricity !!!!!**



**Turning the country On at night !!!**









# Our voracious appetite for energy through the ages of man

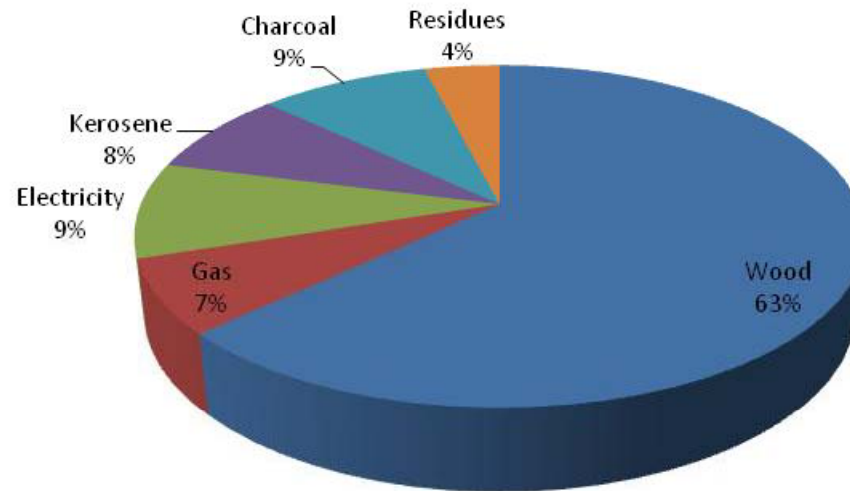
Individual energy consumption  
Adapted from Unesco Courier

Technological man  
man - 1950 AD



-  Energy consumed in the form of food
-  Domestic: Energy for cooking, heating etc.  
Services: Energy for office work, trade, teaching etc.
-  Electricity
-  Energy

### Domestic Energy in 13 SSA Countries



Primitive man - 1,000,000



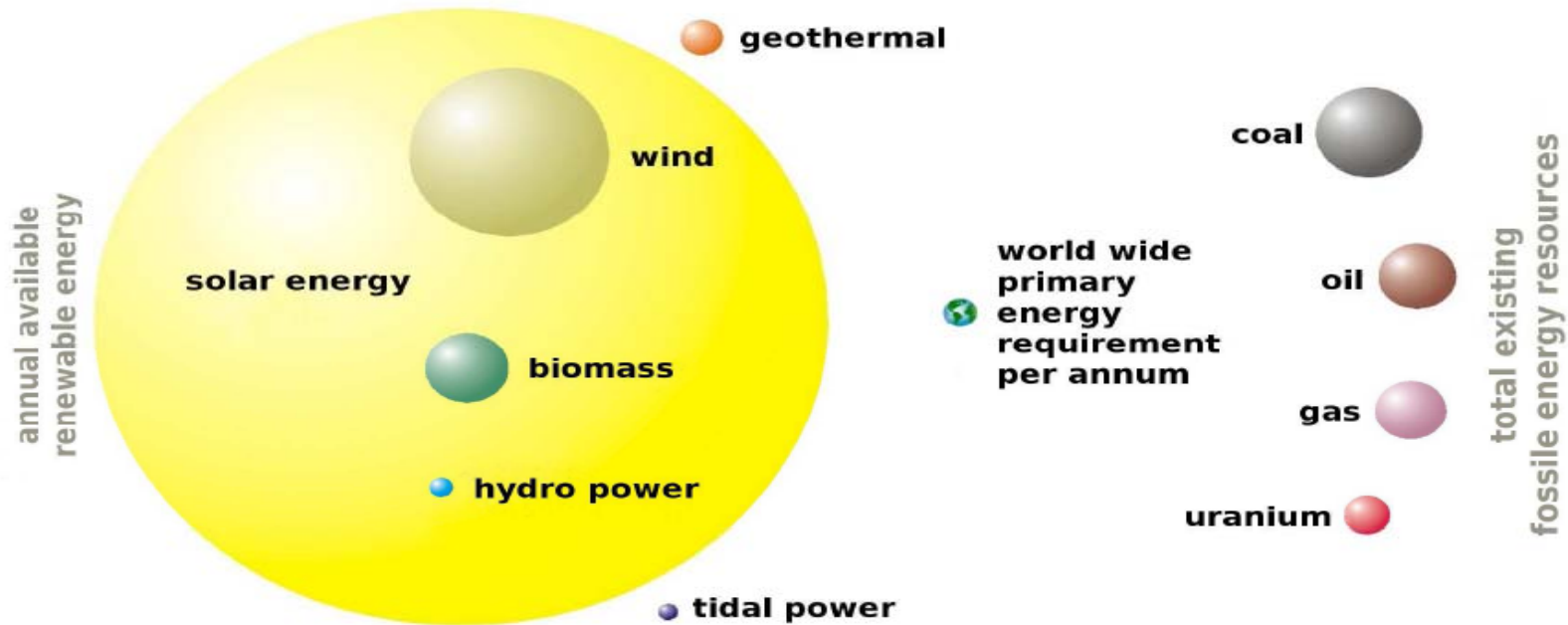
Today **45%** of the world's population consumes **77%** of the world's energy production.

Or **74%** of the world's population uses less than **1/4** of the energy produced





Energy-Resources world-wide - all Renewables



The myth of renewable vs fossil fuels is that renewables cant compete



When Thomas Edison invented the light bulb he vowed that electricity would be so cheap and available that only the rich would keep burning candles.

Try telling that to today's residents of Africa, still making do with candles and wood some 130 years later.

**Worldwide about 1.5 million people die annually from indoor pollution due to lighting and cooking.**



**"I'd put my money on the sun & solar energy. What a source of power! I hope we don't have to wait until oil and coal run out before we tackle that. I wish I had more years left."**

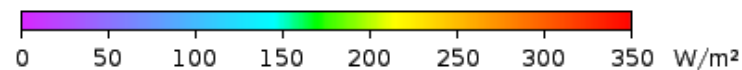
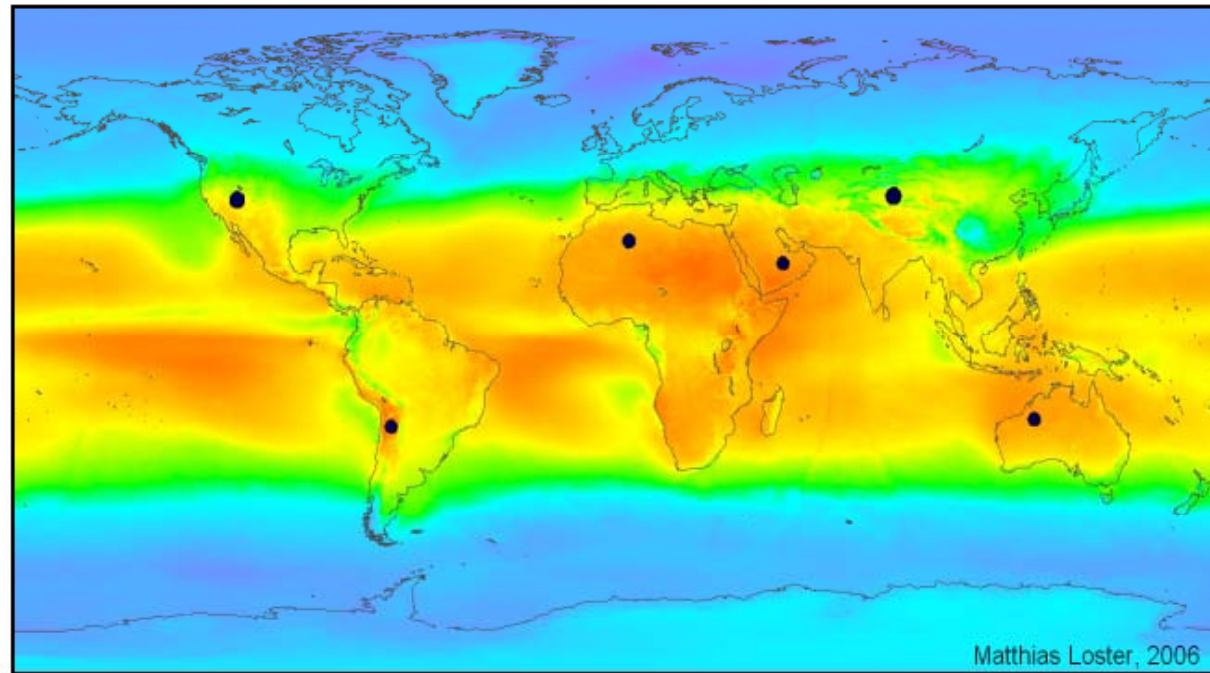
**Thomas Edison, 1931**



clean energy solutions

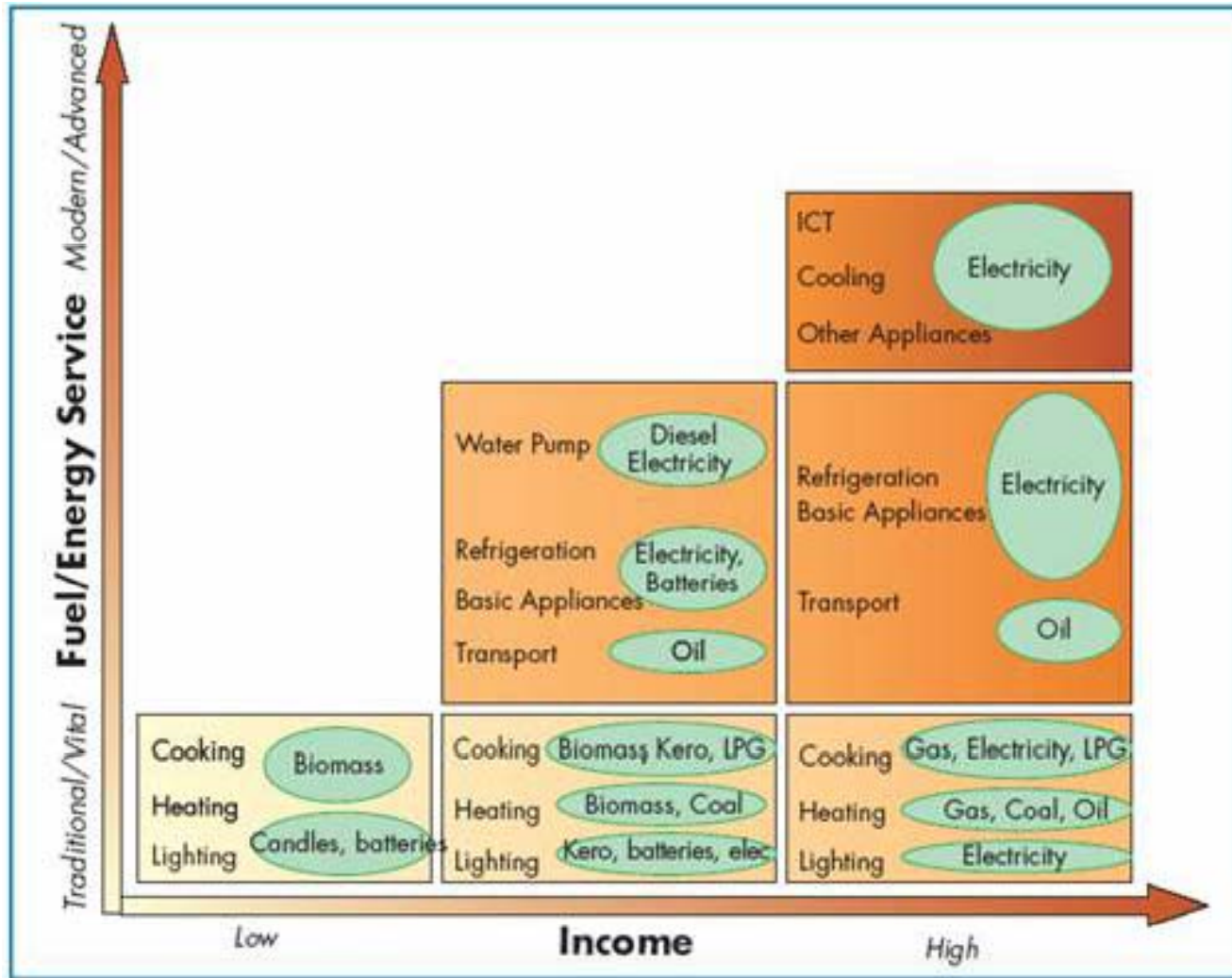
## Countries with highest potential for solar deployment

1. India
2. China
3. Pakistan
4. Ethiopia
5. **Nigeria**
6. **Uganda**
7. **Sudan**
8. Afghanistan
9. **Tanzania**
10. **South Africa**
11. **Niger**
12. **Somalia**
13. Brazil
14. **Kenya**
15. Nepal
16. **Mozambique**
17. **Burkina Faso**
18. **Madagascar**
19. **Malawi**
20. **Zimbabwe**

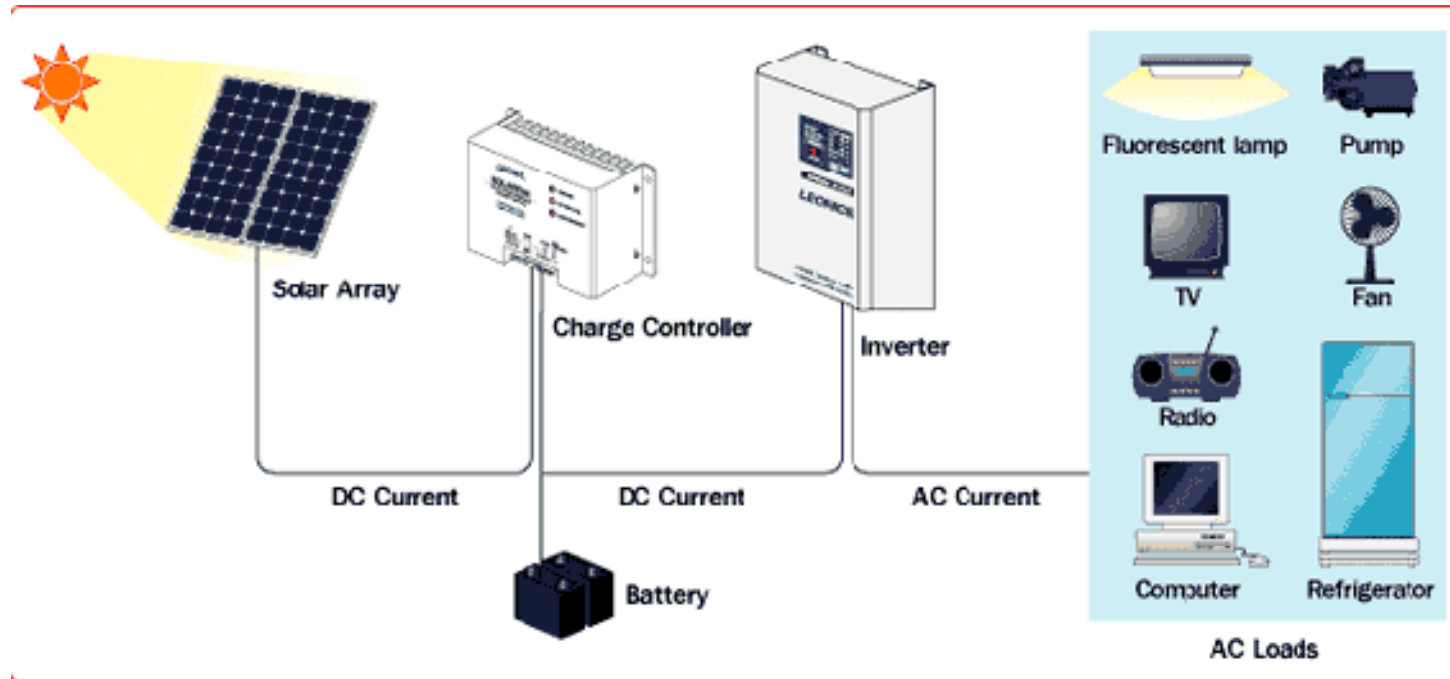


$\Sigma \bullet = 18 \text{ TWe}$

**Is Solar renewable fit for purpose in South Africa ?**

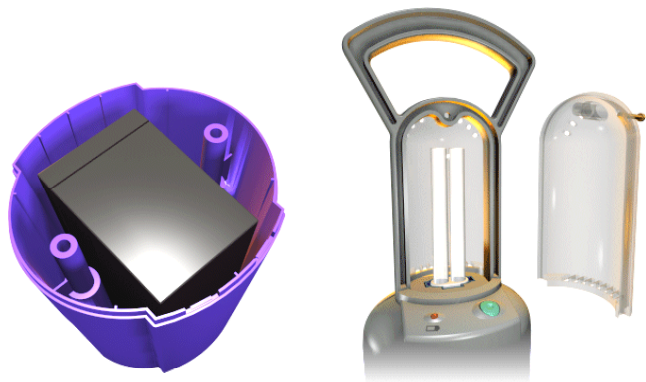


# Simple clean and Green





Solar lighting and charging systems are readily available and “off the shelf”



# Solar Home Systems: Solving a range of criteria

Modular : PV, regulator, battery, lights, plugs

PV lighting and power kits

Easy to ship, install and maintain

Scalable: start small and grow as funds are available

durable : works in the harshest climates

Rapid deployment (can even be carried to site)

Enables local skills and employment

Creates a sustainable business(upgrades, repairs)







Description	Qty	R/Unit	R Total
Solar 68Wp	1	2400	R 2 400.00
Battery 102 AH 12VDC	1	895	R 895.00
solar regulator	1	190	R 190.00
Battery Box*	1	50	R 50.00
Inverter 500 VA	0	0	R 0.00
Structures**	1	150	R 150.00
Sundry wiring***	1	100	R 100.00
Installation****	1	0	R 0.00
Hardware Subtotal			R 3 785.00
<b>Project Total excluding VAT</b>			<b>R 3 785.00</b>
VAT			R 529.90
<b>Project Total including VAT</b>			<b>R 4 314.90</b>

At a linear cost of R 100 per month, asset is paid off in less that 4 years

# Clinics powered by the sun



A Custom Built, portable vaccine refrigerator in the Congo

## Mission critical items on Solar :

Vaccine freezer

Portable X-Ray

Life support system and monitors

“max cart” for resuscitation

Lights and power



Low wattage vaccine freezer







# Schools





## Solar Cooker

### Attributes

Simple construction

Robust

Clean

Cheap

Durable

Safe



### benefits

Fossil fuel reduction

Precooker or full cooker

Water sanitation

Water desalination

No air pollution

Never runs out of sun!

# Water heating, pumping and irrigation



No diesel, no grid , easy to deploy



## Combined electricity and water heating



An example of a dual functional home in Kenya:  
Water and electricity from the Sun

# Success of Large Scale PV Kigali Rwanda

Currently, only 5% of Rwanda's population has access to electricity, but the government has set the target of 16% by 2012 and 35% - 40% in 2020.



**325000 kW hours of electricity annually, thereby eliminating the emission of some 300 tonnes of carbon dioxide.**

**250KWp solar output  
4000 62.5Wp panels  
33 8KVA inverters**



## **Call to Action and deliver the SANAE vision !**

**National Treasury to allocate a % of REFIT to off grid PV,SWH and cooking ( via a displacement formula)**

**Allocate a % of "Carbon Tax" levied on fossil fuel and the vehicle CO2 values**

**Set hard targets and deliver via Dept Human Settlements**

**Stop tokenism by Eskom ( 1MWp solar plant at Kendal!!!) and use this for rural rollout**

**Deliver via Dept education**

**Deliver via the Health and Dept of Welfare**

**Involvement of DTI**

**Community engagement and rollout of 3 pronged energy solutions**

**Stop the talk and start the walk!!!!!!!!!!!!!!!!!!!!**



Thank You



**Action for Energy**

25 – 26 August 2010

Energy People Working Together

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The South African National Energy Association