

**THE POLICY AND INSTITUTIONAL ARRANGEMENT IN
SUPPORTING RENEWABLE ENERGY PROJECTS – LOCAL
PERSPECTIVE**

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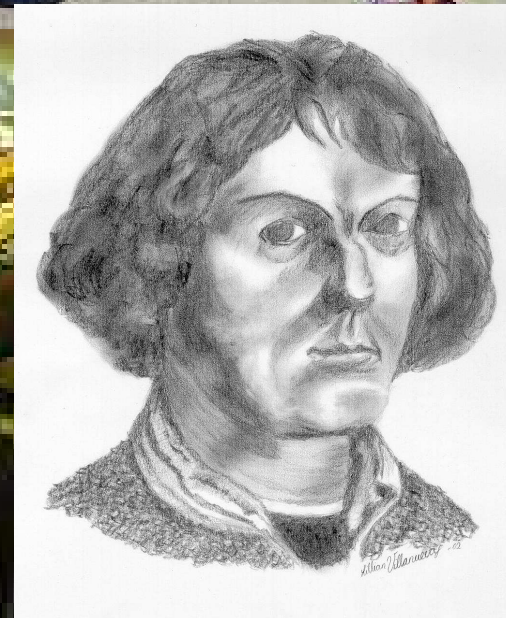
WORKING TOGETHER FOR UBUNTU

CONTENT

- History
- Status of projects
- Feed in tariffs
- Principles
- Recommendations



ENERGY



A non-expert view

Why is Energy a problem?

- Later in 1905 Einstein showed how mass and energy were equivalent expressing it in the famous equation: $E=mc^2$ (energy equals mass times the velocity of light squared). This equation became a cornerstone in the development of nuclear energy.
- One brick weighing 4kg will have energy equivalent to $4 \times 300\,000\,000 \times 300\,000\,000$ kg m/s m/s
 - » 100 000 GWh
- Equivalent to 30 years usage on the total load. (about 3800Gwh per hour)
- Why do we then have a problem with Energy? Why do we have load shedding?
- Was Newton wrong or was his theories simplifications or just a reflection of the trend of physics at the time.
- Was Einstein's theories maybe just applicable to the nuclear physics?



WHERE DOES IT LEAVE US NOW IN TERMS OF ENERGY

- WIND IS PRIMARILY CAUSED BY THE SUN
- WAVES ARE CAUSED BY WIND AND ASTROPHYSICAL GRAVITATION
- FOSSIL-FUELS (oil, gas and coal) were primarily caused by the sun millions of years ago
- FIREWOOD AND OTHER ORGANIC FUELS were and are primarily caused by the sun
- Steam is made from fossil fuels, bio-fuels or electricity
- Electricity is generated from fossil fuels, nuclear fission, hydro electricity, wind, sun, Geothermal or Wave energy
- Mass is energy (or was Einstein wrong)
- Any mass with a temperature above -273 degree Celsius represents energy
- Geothermal energy is caused by ??? (nuclear, chemical)

Except for Nuclear Fission in the Sun, nuclear fusion on earth, some Astro physical gravitational forces that can lead to energy sources on earth and geothermal energy, ALL OTHER SOURCES OF ENERGY ARE MERELY ENERGY CARRIERS OF SOME KIND

Lets go back to some major incident that happened almost 100 years ago



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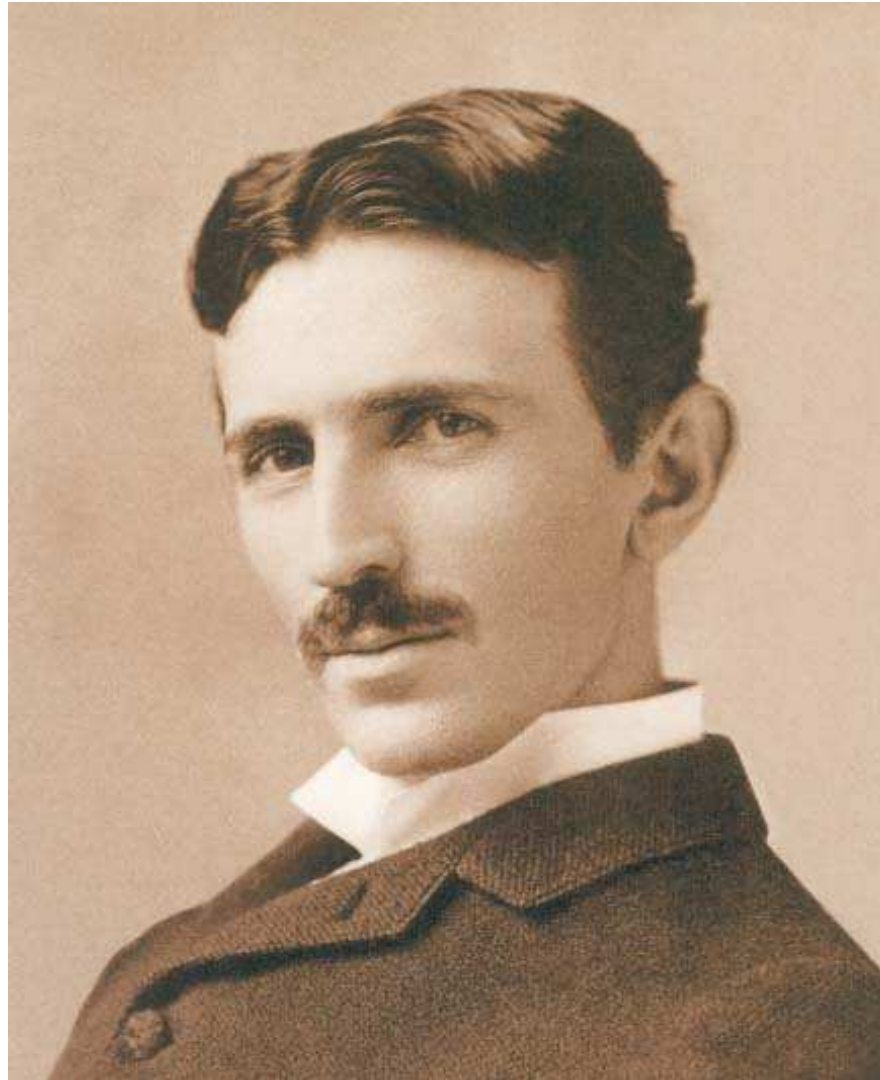
Did you know that in 1908 in Siberia, one of the most catastrophic, mind-blowing (and mysterious) cosmic impact catastrophes *ever* in the history of civilization occurred - and yet it wasn't widely known outside Russia (save for a few astronomy and research scientist enclaves) until around the 1970's? Even interested research parties didn't learn about or even set foot on the scene of disaster until 1921. It didn't make front page news in the papers when it happened because of the extreme remoteness of that region of Siberia. Also at play was the secretive, unsettled nature of Russia at the time (which of course only heightened the many conspiracy theories surrounding it today) .

The so-called 'Tunguska Event' refers to a major explosion that occurred on 30 June 1908 in the Tunguska region of Siberia, causing the destruction of over 2000 km² of taiga, globally detected pressure and seismic waves, and bright luminescence in the night skies of Europe and Central Asia, combined with other unusual phenomena. The 'Tunguska Event' may be related to the impact with the Earth of a cosmic body that exploded about 5–10 km above ground, releasing in the atmosphere 10–15 Mton of energy. Fragments of the impacting body have never been found, and its nature (comet or asteroid) is still a matter of debate.

WHAT CAUSED THIS EXPLOSION ????

NICOLA TESLA

Is there an unknown means to create energy?



In Summary

- What we know as sources of energy are mostly energy carriers.
- The relation between energy, mass and waves are complicated, and probably not fully known. There are huge resources of energy in the world.
- It took the world almost 100 years to consider accepting the simple theories of Copernicus.
- Almost 100 years ago the Tunguska event could not be explained. Maybe Tesla had the answers.
- We know very little about energy and there are many more energy carriers, as yet, not utilized.

HISTORY OF NMBM RENEWABLE ENERGY PROJECTS

- The NMBM called for proposals for any RE projects in 2005
- Our actions were founded on a Realistic and Futuristic National White Paper on RE
- No enabling Legislation or Regulations
- We had to face the MFMA which to most of us on the surface seemed extremely hostile towards any long terms sustainable RE projects
 - 3-5 years: acceptable ... 25 years: impossible!
- No feed-in tariffs
- No SA bench markings
- Eskom not supportive
- Electricity pricing low
- DTI “selling spinning reserve”

An aerial photograph of a city, likely Durban, South Africa, showing a large stadium in the foreground and various buildings and infrastructure in the background. The image is used as a background for the text.

AFTER an ANALYSIS of the SITUATION WE CAME TO THE FOLLOWING CONCLUSIONS (2005)

- The only advantage South Africa had in terms of the rest of the world was a low electricity tariffs based on the historic capital cost of dirty coal generation and a coal price not linked to the world market price.
- The low ESKOM tariffs as applicable then , was not sustainable and would have had to be doubled in 6 years time .
- International and local pressure would force us to give RE a fair opportunity
- Economic factors would also make RE the preferred energy source within a number of years.
- The price of RE and EE must be compared with the cost of new , clean generation sources.

**SO THE NMBM COUNCIL and the MM instructed us to
PROCEED ROBUSTLY**

OBSTACLES

- We decided to Interpret the MFMA in a broader context and give the Environmental Considerations and the principles of sound governance as per the MFMA higher priority than narrow control mechanisms as prescribed in some sections of the MFMA.
- We signed PPA's for most of our projects at levels of 45 to 65c per unit
- We started exploring the carbon market
- We started promoting the use of RE and EE and explored working with any partner having the same goals
- THE NMBM accepted a process of **GOING GREEN**



CURRENT STATUS

We found working with CEF was an easier way than doing it all ourselves

The following projects are in an advanced stage

- 100 000 SWH's HP systems – to start installations on 1 July 2009 (working with CEF and Ekurhuleni)
- LP SWH 's – Installations of first 1000 underway
- Industrial SWH's - finalising subsidies from Eskom and/or DBSA (or any other funding institutions)
- 23 MW wind farm – preferred service providers appointed – EIA underway
- Landfill sites – process underway with CEF
- EE buildings, water treatment installations and streetlights - feasibilities completed – working with CEF and FDA
- Water reclamation works - International Private company in the process of finalising design
- De-centralised Grid generation PV and Wind – Installations completed and now in evaluation phase (By-laws to be amended shortly to make de-centralised grid connected generation possible).
- Domestic Water heater ripple control system - 40 000 of a possible 100 000 units already installed – this system will be used to switch the back-up elements of the SWH 's to optimise the use of solar energy in our SWH program.

Other initiatives

- Micro Hydro project - feasibility currently underway – The NMBM will buy the green energy to make these projects bankable
- Power generation from wood waste - This project is in another Municipal area and we will again buy the green component of the energy to make the project feasible
- Smart metering – Evaluation phase is completed
- Embedded Generation using micro wind and Solar PV storage batteries grid connect – Evaluation in progress
- Wind power aspect traffic signal heads – tender being evaluated

Feed in Tariffs - REFIT

- This is long overdue and we welcome the initiative
- Any level of feed in will make our projects more viable - and we can even make some profit
- Feed in tariff levels must be reviewed from time to time
- There should not be only one buyer, Eskom should not be that buyer and Municipalities must at least be allowed to buy a limited amount of RE from within their own areas. We calculated this level to be 5% without feed – in tariffs.
- FEED-IN TARIFFS for RE and SUBSIDIES for EE must be based on at least the AVOIDANCE COST OF NEW CLEAN COAL GENERATION FACILITIES or NEW NUCLEAR POWER STATIONS including eventual rehab or de-commissioning and environmental restoration costs
- In addition to the above the positive long term impact on the economy must be considered

PRINCIPLES

- Provide a Regulatory framework for RE which by nature is de-centralised generation of energy
- RE will be the cheaper form of energy in the longer term
- The benefits to the economy will be huge
- It will release capacity on all transmission and distribution networks throughout the country
- Let the average man and woman become involved in RE as much as possible
- Conventional Base generation and peak generation stations will still be needed
- It will be virtually impossible to control a swell of RE awareness and multiple de-centralised micro generation from a central control
- REFIT should be legislated or regulated in an effective implementing regulation

Conclusion

- Establishment of the wind farm:
 - EIA in process
 - draft scoping report issued
 - first round public participation complete
 - ROD expected December 2009
- Landfill to Gas
 - EIA in progress
 - Possible change in Legislation – Generation end 2009
- Bio Gas from FWF
 - Viability study complete
 - Awaiting Financial Approval
 - Site Kick-off October 2009
- Solar Water Heating
 - Tender complete – Procurement end July 2009
 - Kick-off August 2009
- Energy Efficiency
 - DORA grant R111M over 3 years
 - Public lighting
 - Municipal buildings
 - CFL's
 - Aspect head traffic signal
 - Fresh and Sewage pumping
 - Sewage aeration

