

Integrated technology solutions through EnerKey

Benchmark housing project for the poor: The integrated Energy Environment Empowerment Cost optimized (iEEEC^o) Human Settlement Project



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Durban 30. Nov. 2011



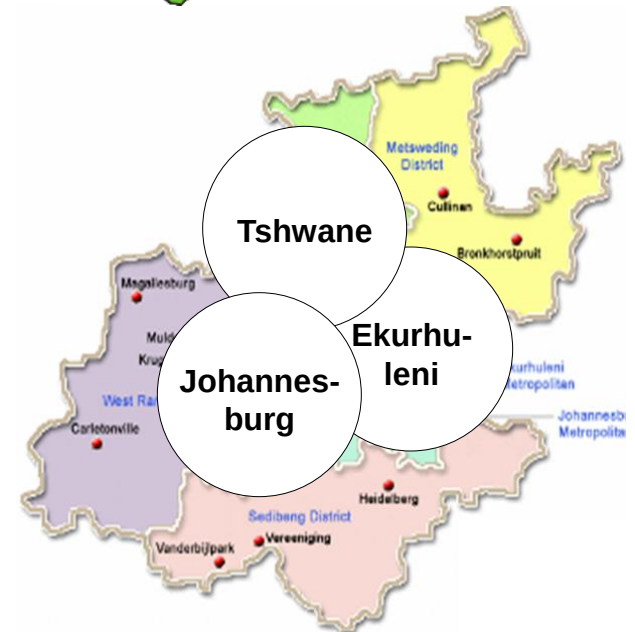
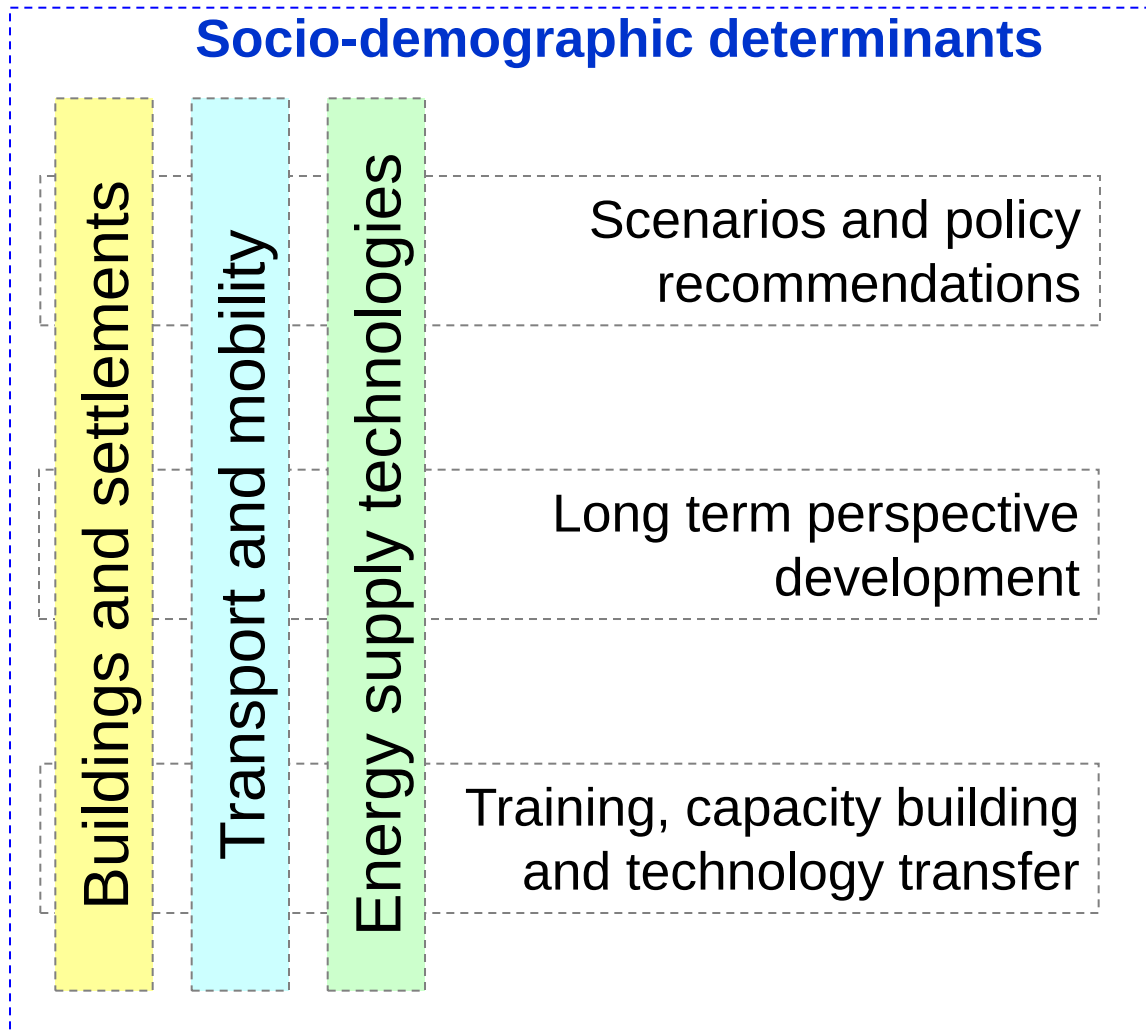
EnerKey: science, local governments and the civil society together towards a low carbon Gauteng (mega)city region



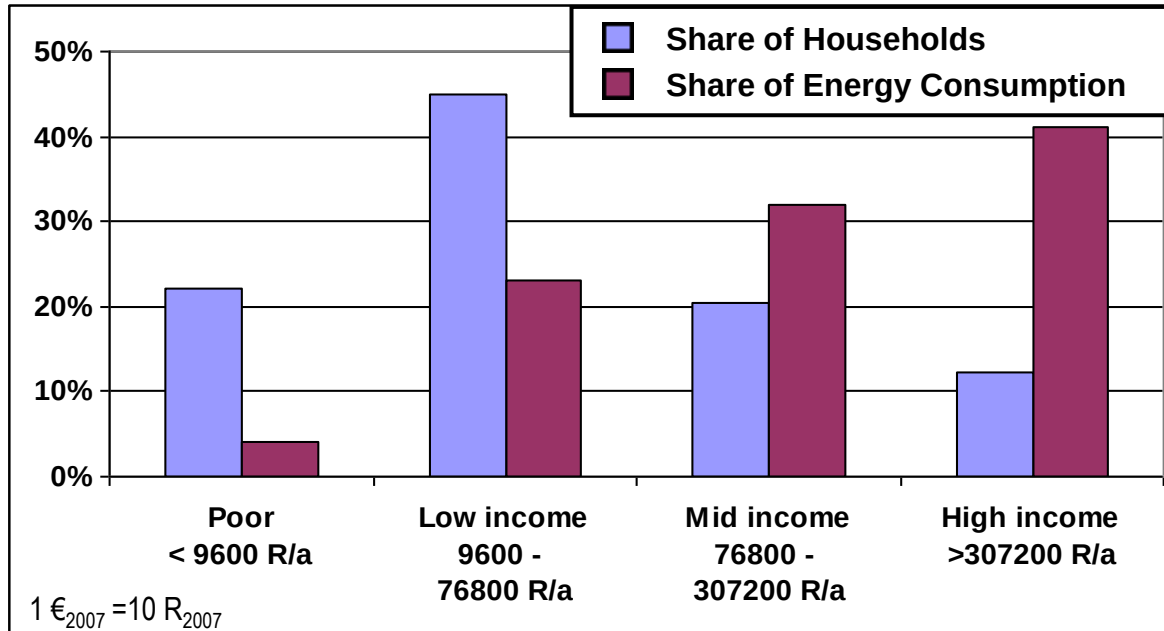
An alliance of SA and German Universities, local authorities, NGO and businesses for service delivery in energy efficiency and climate protection



Integrating energy technologies into frame conditions



Energy consumption in different income groups

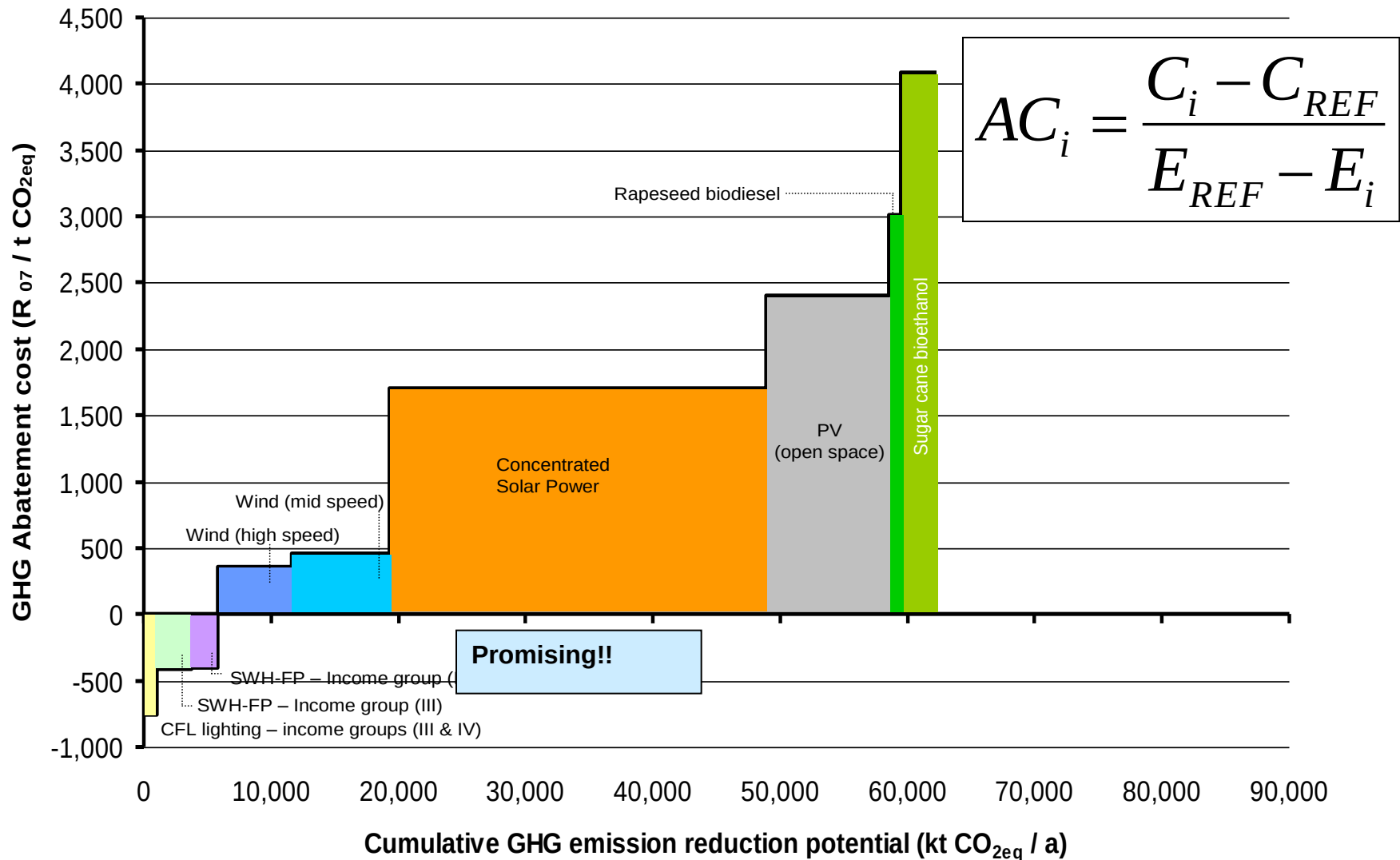


- Disparate income distribution; high Gini coefficient
- The richest 30% of households consume > 70% of domestic energy demand

Consequences for sustainable energy concepts

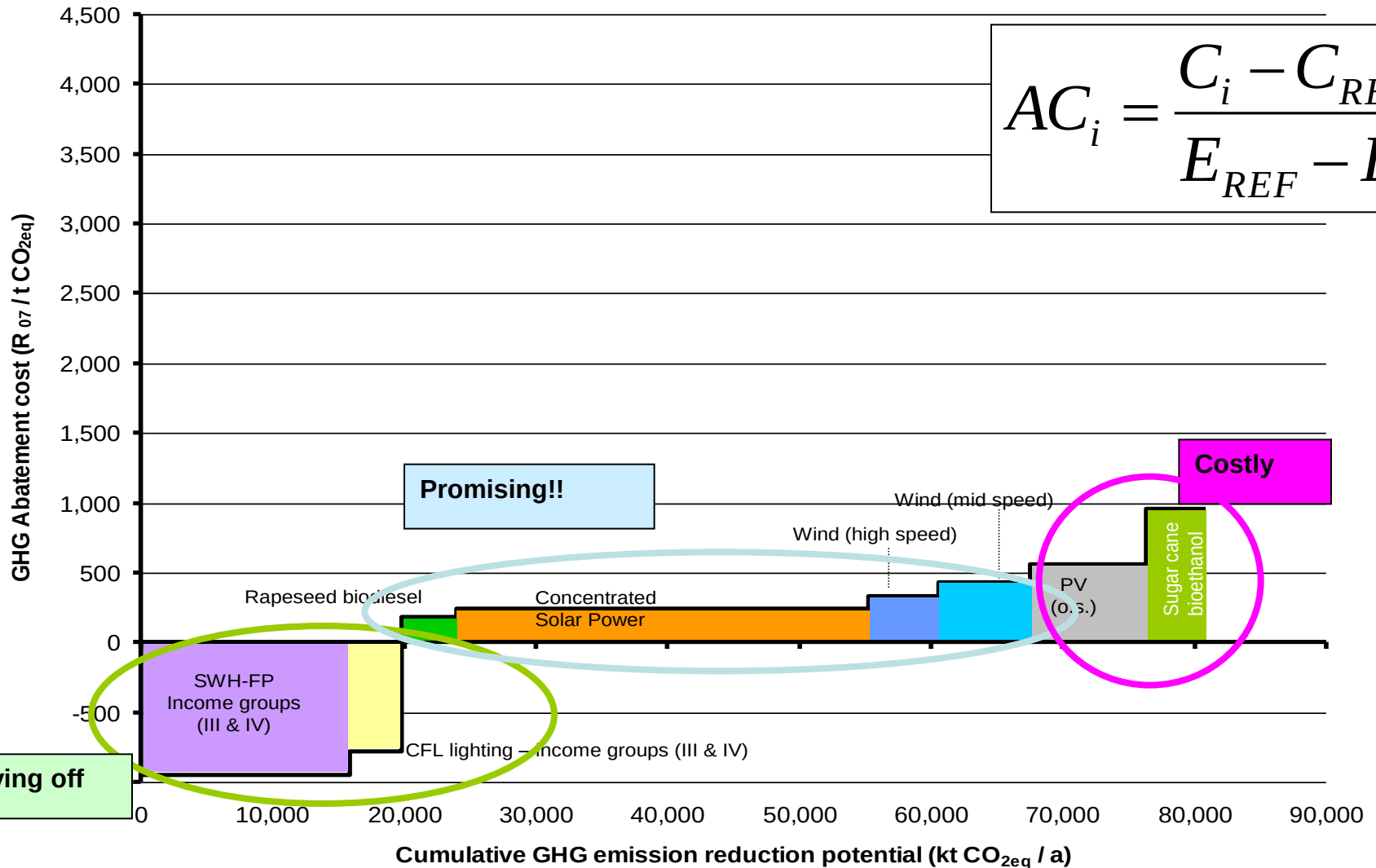
- Future income distribution (increase in standard of living) will strongly drive energy demand
- Specific approaches and technologies for each income group are necessary

Cost–potential curve for energy technologies in Gauteng for 2007

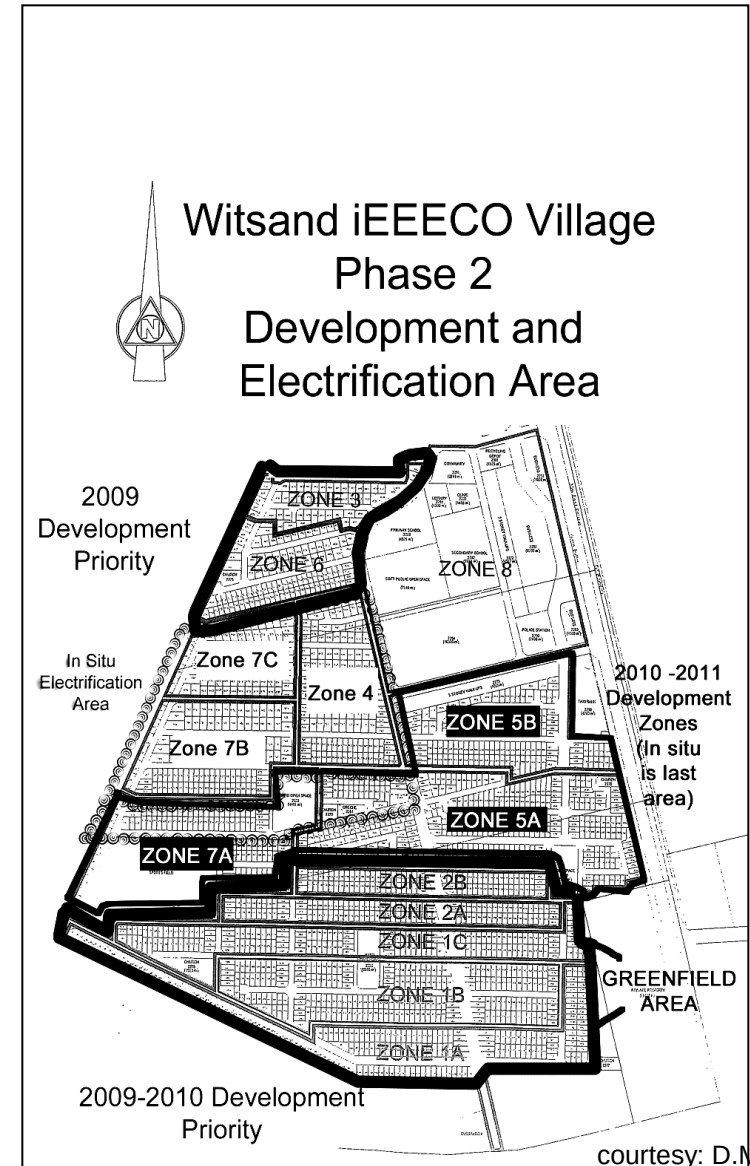
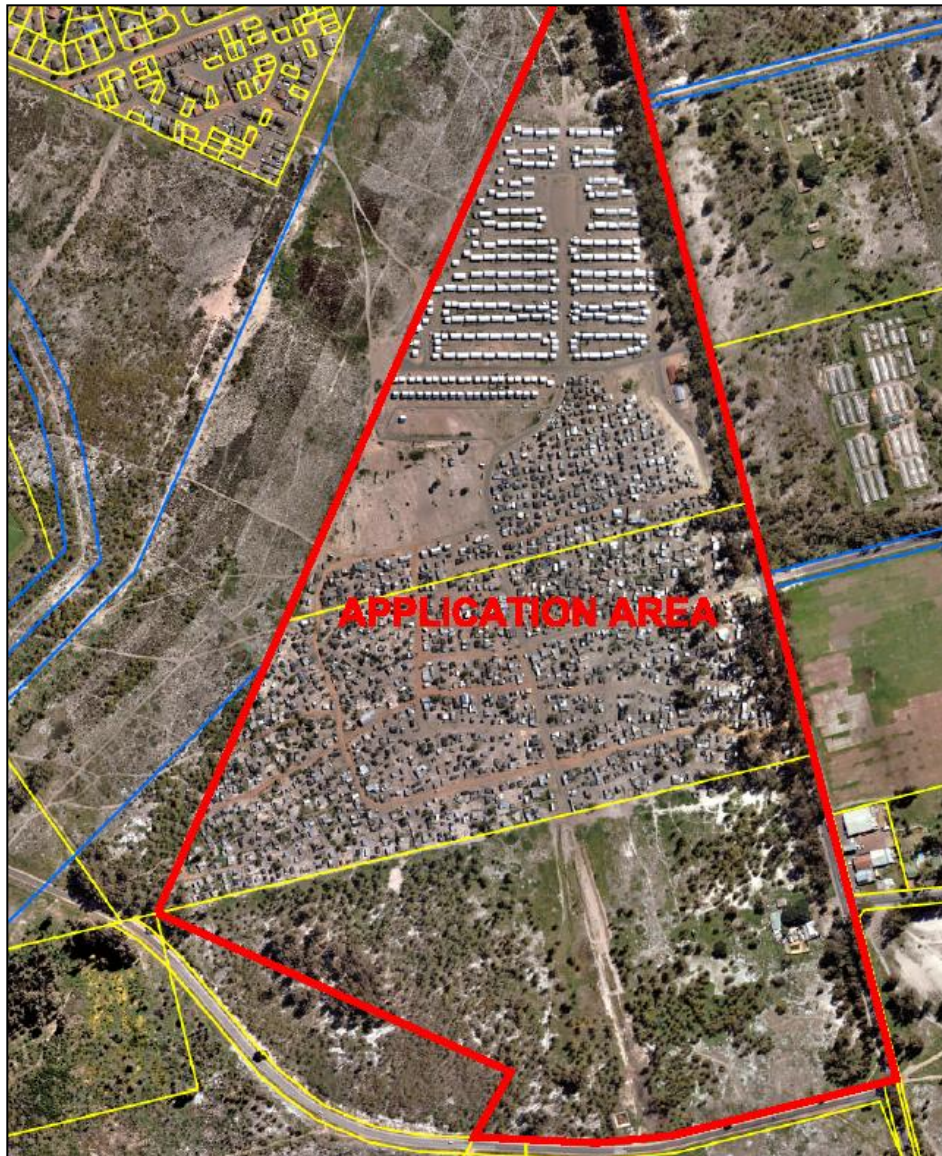


Cost–potential curve for energy technologies in Gauteng for 2040

$$AC_i = \frac{C_i - C_{REF}}{E_{REF} - E_i}$$

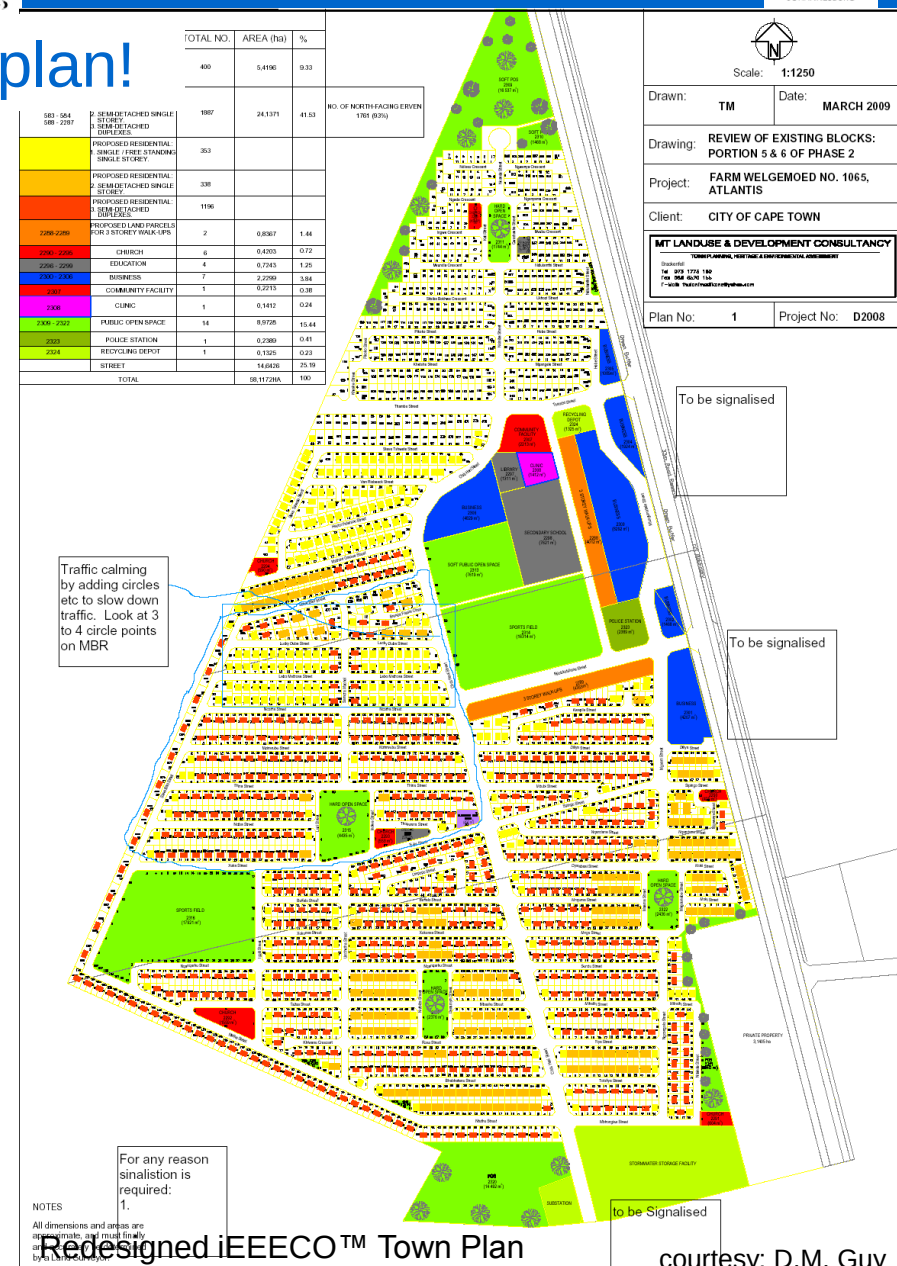


The Witsand iEEECO™ Village



New integrated town development plan!

1. energy and environmental conscious human settlement design/modified site plan vs. business as usual
2. Energy Efficiency and demand side management (EEDSM)
3. Consequent north facing houses and windows – passive solar design
4. Embedded monitoring evaluation reporting verification and certification
5. Focus on women empowerment and community training
6. Integration of government inspection and reporting
7. iEEECO™ domestic use of energy committee (safe stoves etc)
8. Increased safety; risk reduction (fire, indoor pollution, mould, others)



courtesy: D.M. Guy

The baseline situation!! High demand for basic services

Water Services



Photos by Susan Cook



Housing/Electricity



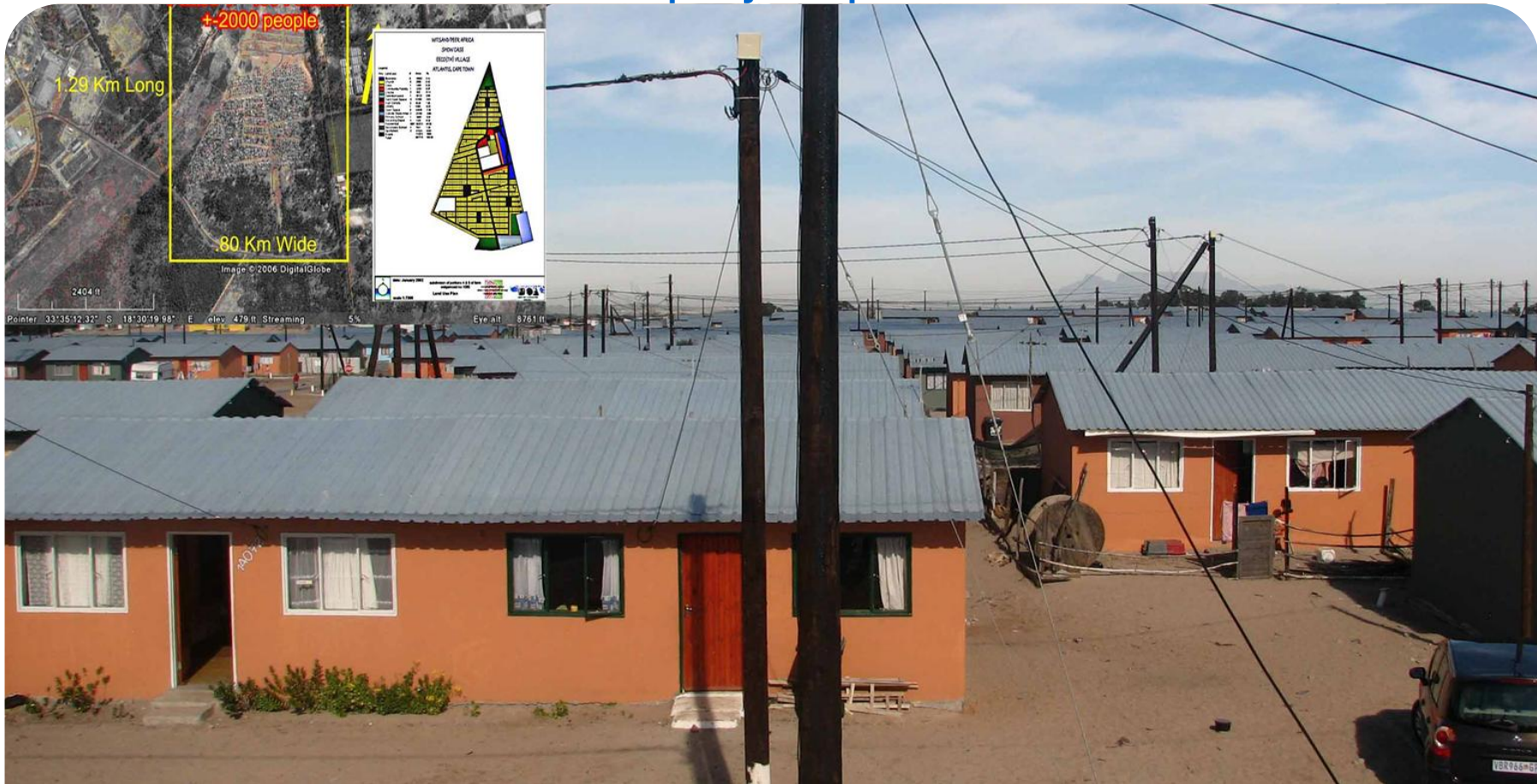
Domestic Use of Energy

Extremely High Unemployment!

Sanitation



Witsand project phase 1



Witsand Phase 1 iEEECO™ Human Settlement Passive Solar Redesigned Site Plan North Facing Government Subsidised Redesigned iEEECO™ Houses (optimises potential for harvesting solar power on roof tops)

courtesy: D.M. Guy

Medium Density Standard 40m² iEEECO™ Model



**Witsand iEEECO(TM)
Human Settlement - Peoples Housing Process
New Semidetached Units
10 Oct 09**



(c) 2009 PEER Africa

courtesy: D.M. Guy

The new prototype 50m² iEEECO™ Unit



Prototype iEEECO™ Model

courtesy: D.M. Guy

Technical priority interventions: passive solar design!

- 100% passive solar design saves energy and energy expenses!!
- Also the house offers a high service and comfort level!!



North facing orientation
and large window openings



Insulated Ceiling

courtesy: D.M. Guy

Technical interventions 2: renewable energies

Residual energy demand covered with renewable energies

Solar Water Heaters



Hybrid PV and small scale wind turbine



EnerKey Performance Certificate		
Project:	Civic Centre Johannesburg	Valid until: Mar 2011
Building Address: Civic Centre 158 Loveday Str Braamfontein Johannesburg Occupant/Owner: City Council Johannesburg		
Energy consumption (final energy) in kWh/(m²a) This building 102 kWh/(m²a) Primary energy: 349 kWh/(m²a) Reference value: 200 kWh/(m²a) The consumption includes the energy share for: ☒ Heating ☒ Cooling ☒ Water Heating ☒ Lighting ☒ Appliances ☐ Other:		
Building type:	Offices	
Year of construction:	1978	
Useable floor area:	45,523 m²	
Reference value according to:	SANS 204-1	
Climatic zone:	Cold interior (Johannesburg, Braamfontein)	
Issuer's accreditation number / designation:	EnerKey	
Created with:	EnerKey Advisor Version 0.9.0.2	
Issued by: Simon Woessner Fraunhofer IBP Nobelstrasse 12 D-70569 Stuttgart GERMANY		
 (Simon Woessner) Issuer's Signature 04.03.2010 Date		

- A rating of energy consumption with required (maximum) values for new buildings and refurbished existing buildings
- Possibility to check the energy performance of a building
- Simple and clear illustrated with color-coded scale
- Developed according to EU/ISO standards and rules, also SANS 204

Community participation, empowerment and capacity building

1. The iEEECO™ project is driven by the community via the PHP self-help approach. The community leads the project from planning to implementation.
2. Special focus on women development and management of various aspects of the process.
3. New house owners contribute and work for building the houses
4. Training and learning by doing are critical aspects.
5. Small micro and medium enterprise (SMME) development and support are also key aspects.
6. PEER Africa and the community are equal partners in the development



courtesy: D.M. Guy





Witsand iEEECO Housing Beneficiary Support Organisation WEHBSO



PARLIAMENT
OF THE REPUBLIC OF SOUTH AFRICA

MAIN PROJECT STAKEHOLDERS



human settlements

Department:
Human Settlements
REPUBLIC OF SOUTH AFRICA



KCIHT



ESKOM eta-award for the South African iEEECO™ project team



**iEEECO™ SELF HELP METHODOLOGY
WON RESIDENTIAL CATEGORY 2009!**



Thank You/Nkosi



Yvonne Welem
Administrator WEHBSO Witsand Housing Committee,
dlguysr@mail.ngo.za



Douglas Mothusi Guy

Lessons learnt!

1. Cities in SA have still to find their role in energy and climate change policy. They remain the most important implementers of national (and global) policies.
2. Technology is only one part of the story, but not the whole solution! Suitable technologies are already available. Also at competitive costs!
3. Sustainable and durable solutions can only be achieved with active participation of the people!
4. Integration in a pragmatic and practical way is important. Policy is setting the frame, technologies, SME, business will follow.

For more information and contact ...



www.enerkey.de

www.enerkey.co.za

www.enerkey.info

Thank you ...

This project is supported by:



Contact: Dr. Ludger Eltrop IER, Uni Stuttgart, Prof. Harold Annegarn, University of Johannesburg

