

COP17 Flagship Program Case Study: iEEECO™ integrated Energy, Environment, Empowerment- Cost Optimisation Methodology

People Driven Clean Development Methodology -
Addressing the Need to Scale Up Enhanced Basic
Service Delivery as a Tool in the Fight Against
Poverty



energy

Department:
Energy
REPUBLIC OF SOUTH AFRICA



PARLIAMENT
OF THE REPUBLIC OF SOUTH AFRICA



EnerKey



Municipal Clean Development Benchmark

CLIMATE CONSCIOUS People Driven Human Settlement Development Model

Witsand /Kutlwaniong

integrated Energy Environment Empowerment – Cost Optimised (iEEECO™)

Human Settlement, Cape Town /Kimberley Northern Cape

Presented by Kutlwaniong Civic Integrated Housing Trust (KCIHT) Witsand iEEECO Housing Beneficiary Support Organisation (WEHBSO)

PEER Africa/ University of Johannesburg/EnerKey/Nadeson Consulting Engineers



human settlements

Department:
Human Settlements
REPUBLIC OF SOUTH AFRICA



energy

Department:
Energy
REPUBLIC OF SOUTH AFRICA



PARLIAMENT

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Eskom DSM

Content

- **Program Background Description**
- **Current Status**
- **Future Planning and Rollout**
- **Closing Statement**
- **Questions**

Flagship Program Background Description

- 1997 COP 3 Kyoto ‘No Regrets’ Recognition
- Johannesburg Earth Summit –ECO Village
University of Witwatersrand, Soweto ECO
House, Benoni initiative
- 2010 COP 15 Copenhagen EnerKey/UoJ
- 2011 COP17 Flagship Program

Flagship Program Background Description

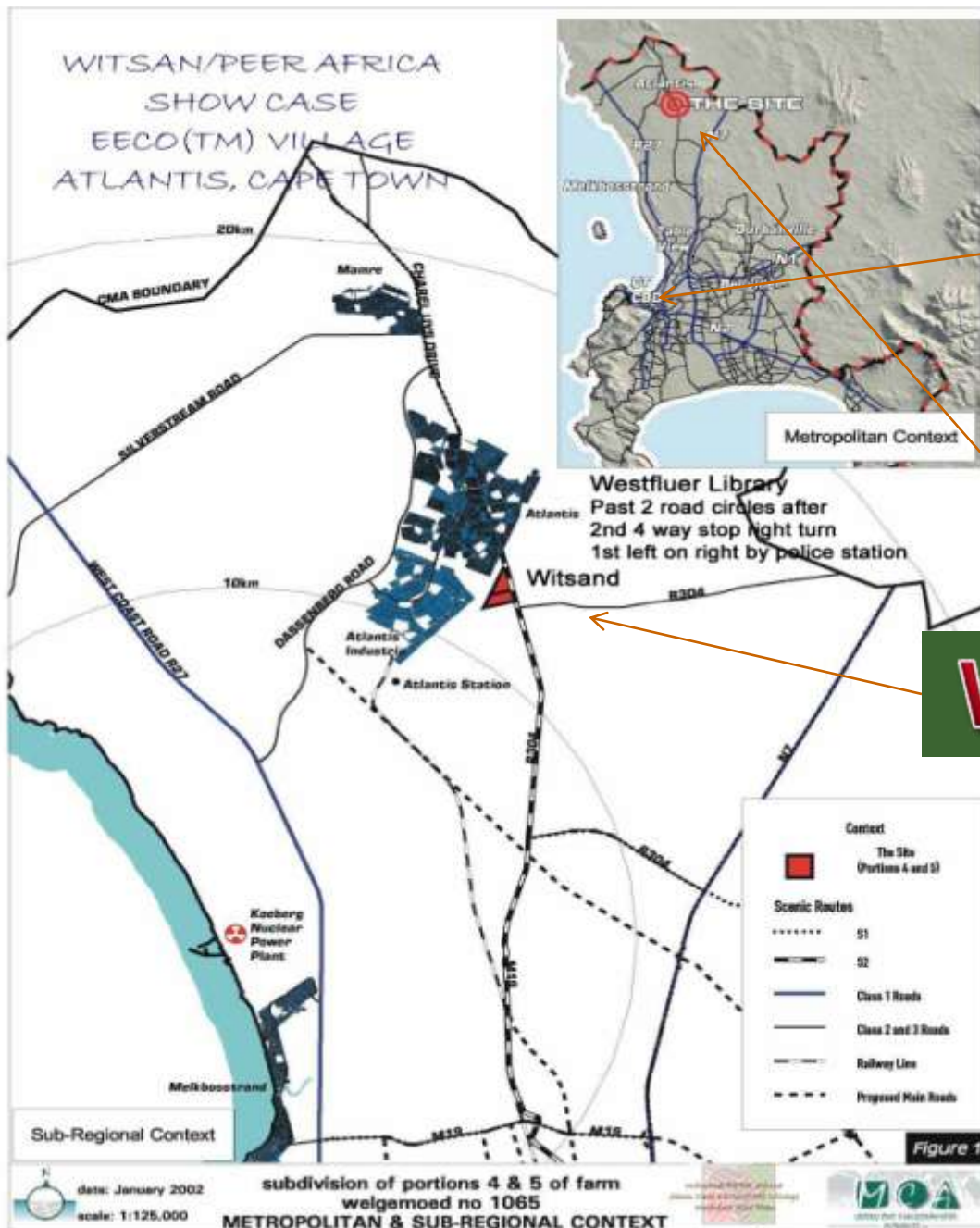
CONCEPT:

16 Year African Clean Development Evolution

From 1994 to Present:

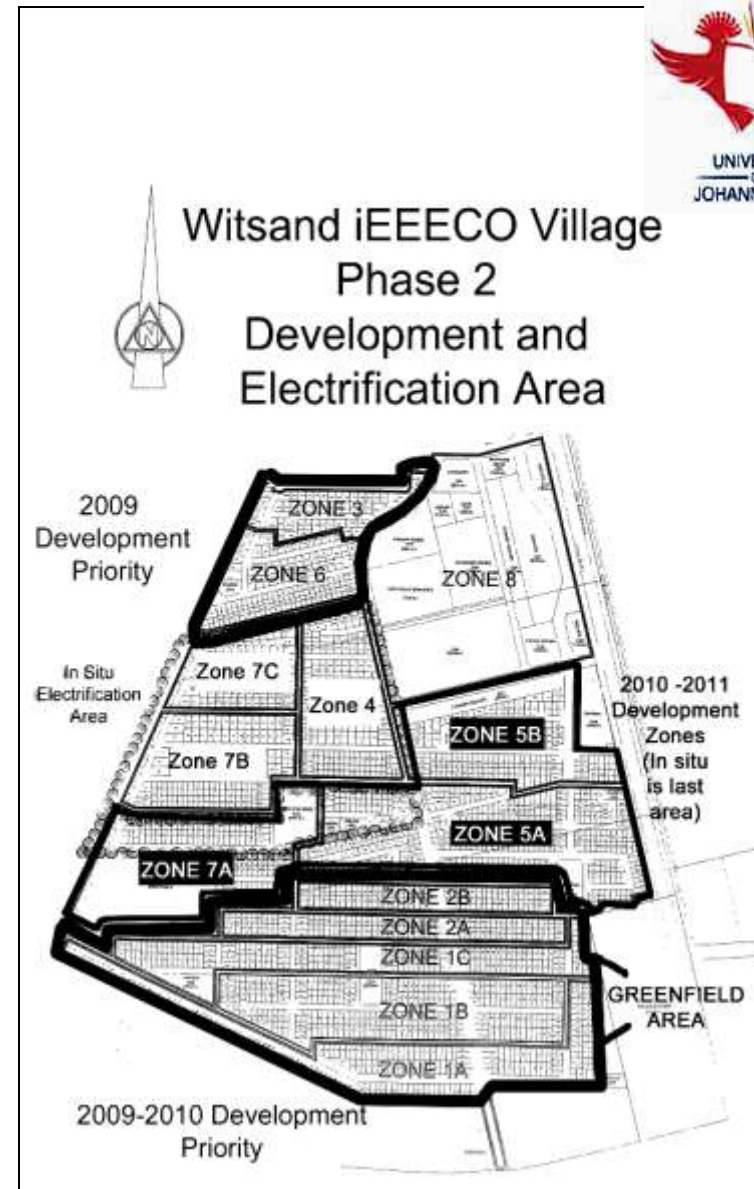
- **Original programmable integrated human settlement demand side energy management mission conceived by Dr. Lilia A. Abron and started in 1995 Northern Cape Kutlwanong**
- **International binational agreement for Joint Implementation established -IIEC/US-RSA DOE/EPA –DoWE support**

WITSAN/PEER AFRICA
 SHOW CASE
 EECO(TM) VILLAGE
 ATLANTIS, CAPE TOWN



Cape Town

Witsand



BASELINE: **PENT UP** DEMAND FOR BASIC SERVICES

Housing/Electricity



Water Services



Sanitation



Domestic Use of Energy

**Extremely High
Unemployment**

Human Settlement Scope of Benchmark Project

Objectives:	Pilot Integrated Com/Res Development
Units:	2289
Subsidised/Mixed/etc Facilities	Mixed (income/races)
Housing specs:	All
Infrastructure	Mixed (subsidy, rental and BNG)
	Yes (Full service)

iEEECO Benchmark Scope

Human Settlement Design Objectives

- 1. Integrated Resource Demand Side Management**
- 2. Renewable Energy**
- 3. M&V Certification**
- 4. Health and Safety**
- 5. Learn by Doing/Local ownership**
- 6. SME/Job Creation**

Flagship Program Background Description

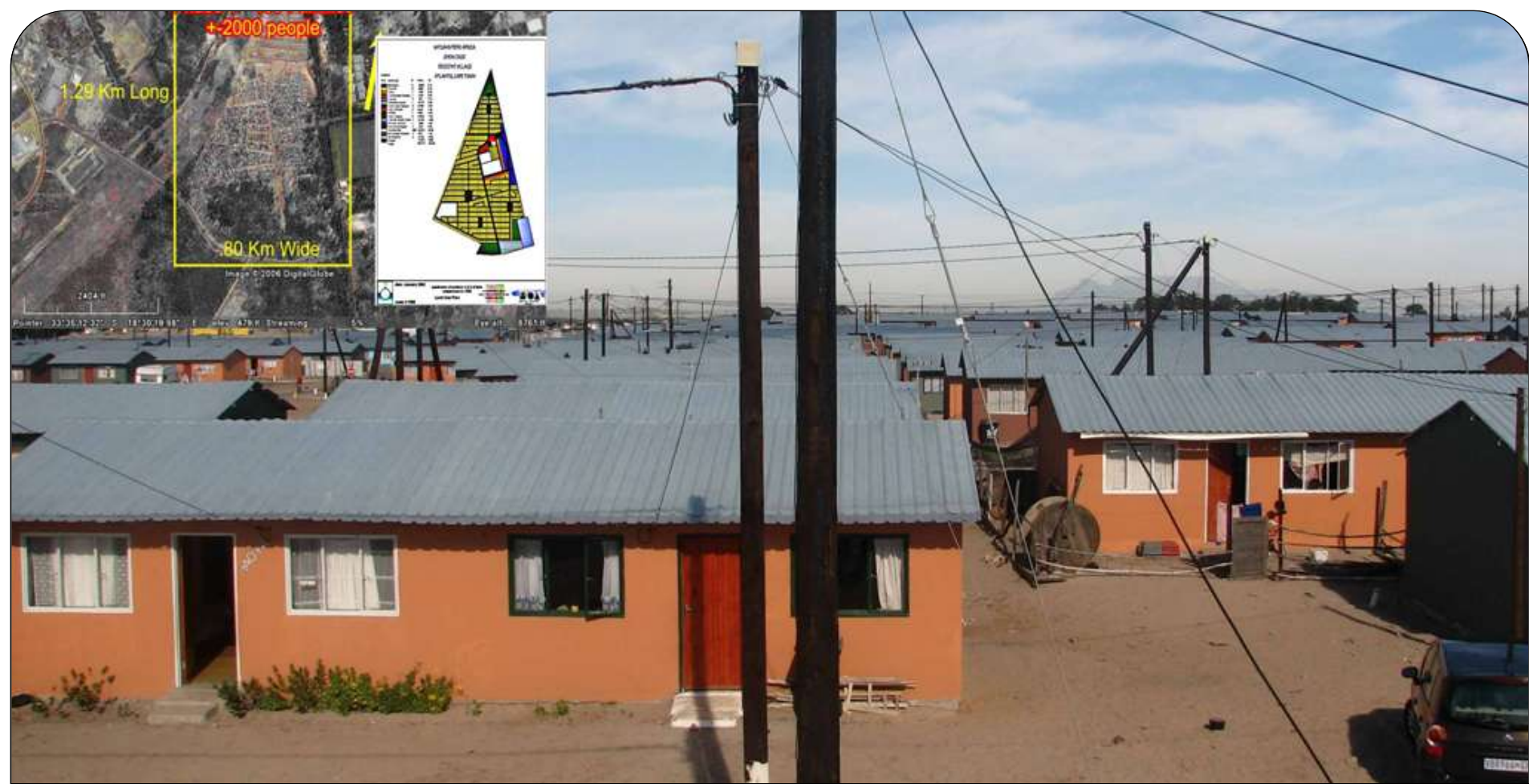
COMMUNITY:

- 1995 –present: Kutlwanong Civic Integrated Housing Trust (KCIHT) Thami Eland led community self-help empowerment initiative via self-help human settlement construction/Energy and training program
- Introduced learn by doing methodology
- iEEECO Baseline established/formalised the DUE externality costs of doing nothing (Health and Safety issues)

Flagship Program Background Description

PARTNERSHIPS:

- **Established Lifecycle Community Based Research, MERVC Reference Site Linkage**
- **Established DoE/Eskom link with Human Settlements, Educational/Research institutions**



Spatial Map

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)

iEEECO Benchmark Scope

Certification:

**Research/
Performance/Service
level**

Health and Safety:

**Fire, indoor air
pollution, Mould**

Learn by doing:

**Self help partnerships
SME**

Integrated Demand Side Management Scope

- 1. Site Selection and Layout**
- 2. Energy Efficiency**
- 3. Water Efficiency**
- 4. EE/WE Appliances and Fixtures**
- 5. Materials**
- 6. Greening Food Production**
- 7. Transport**
- 8. The consumer**

CURRENT STATUS

WITSAND PHASE 2

Integrated Town Plan Incorporating:

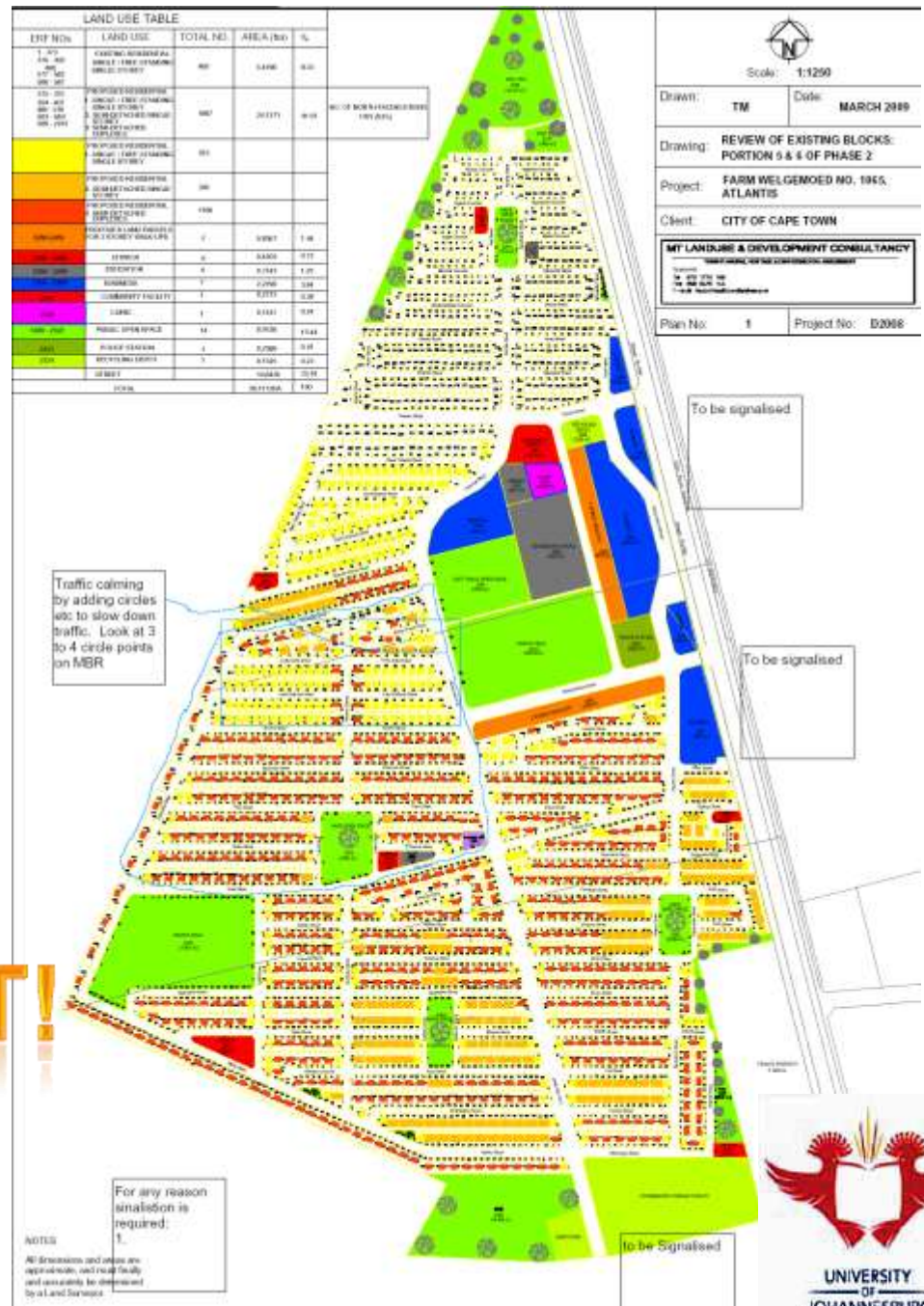
- Energy Efficiency Demand Side Energy Management (EEDSM) Features and Increased Density.

Social Economic Amenities Designed in 2002!

We changed the Business as Usual Town Plan and Street Design for Passive Solar design and a Life Time of Benefits (Energy Related Health and Safety Benefits)

WE CHANGED IT!

Redesigned iEEECO™ Town Plan





100% Passive solar design
Automatically saves energy
House offers high service level

Insulated Ceiling

North facing
Orientation



SOUTH AFRICAN PROJECT TEAM



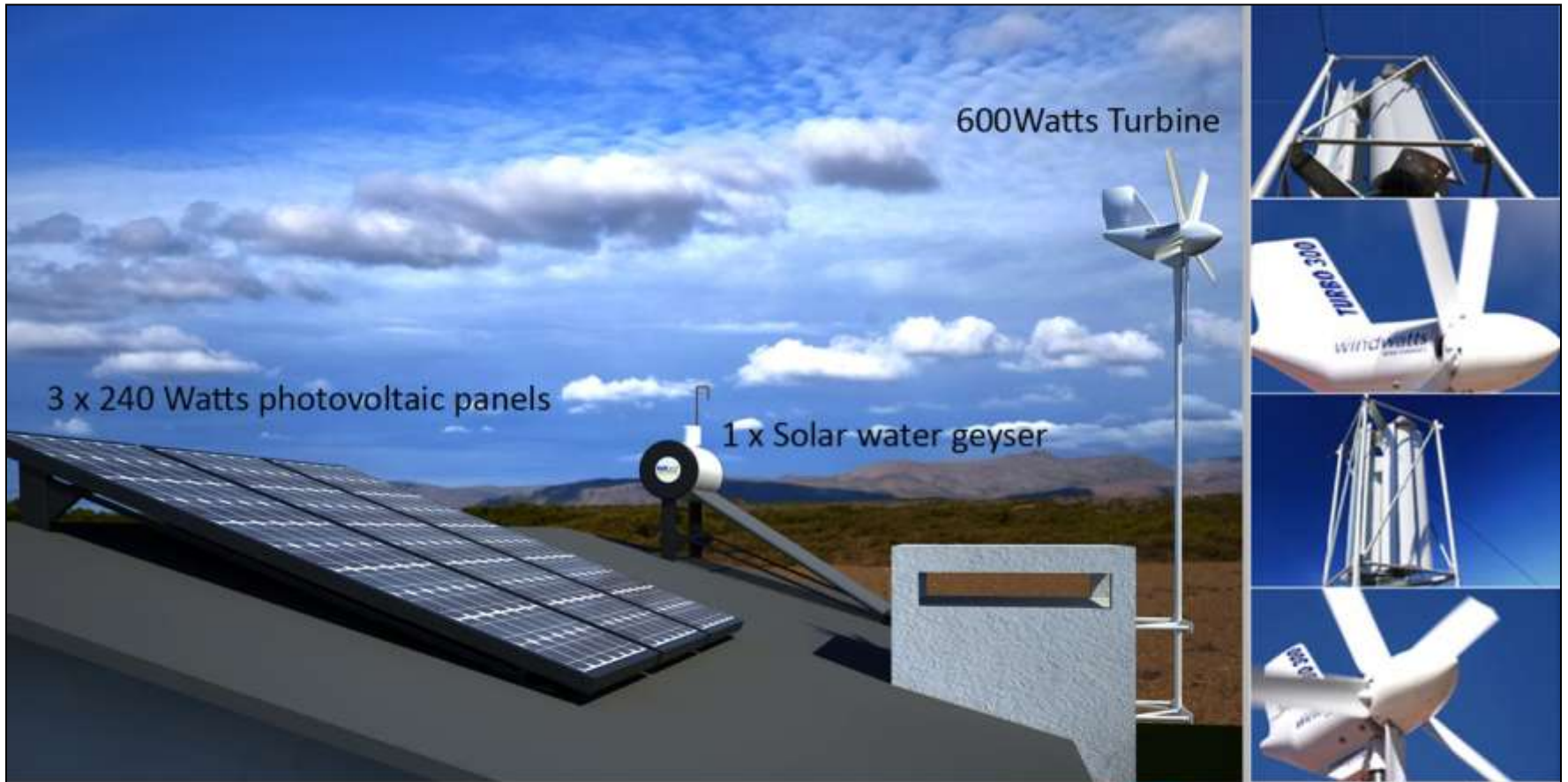
**IEEECO™ SELF HELP METHODOLOGY
WON RESIDENTIAL CATEGORY 2009!**

Eskom eta Award



2011-2015 INITIATIVES

- **LARGE SCALE RENEWABLE ENERGY PROGRAM**
- **LARGE SCALE FREE BASIC ENERGY PROGRAM FOR THE POOR**
- **RURAL iEEECO DEVELOPMENT MODEL HUMAN SETTLEMENT**



600Watts Turbine

3 x 240 Watts photovoltaic panels

1 x Solar water geyser



CLEAN ENERGY

windwatts

WIND TURBINES



Prototype iEEECO™ Model



Municipal Clean Development Program

Panarama Weatherstation 23 July 2011

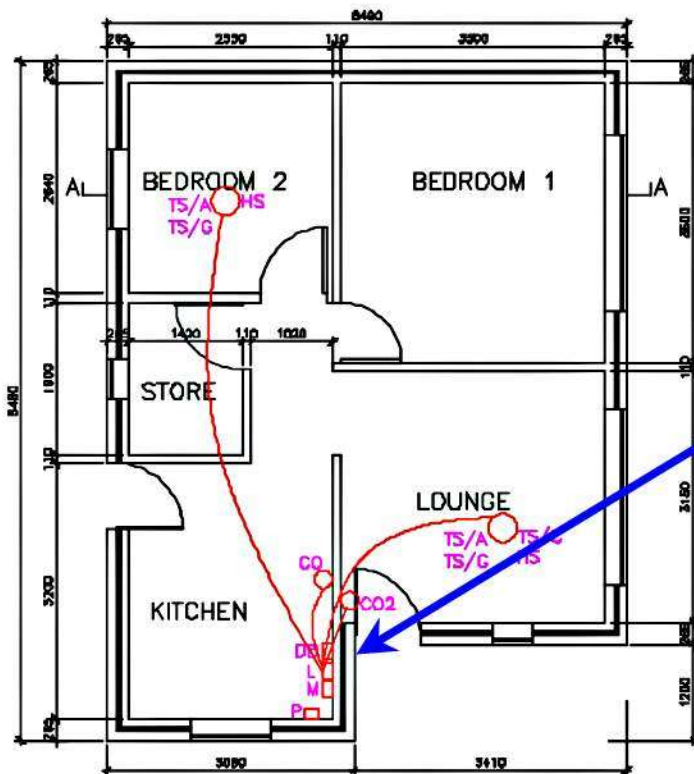


PATENTED: EMBEDDED MONITORING EVALUATION, VERIFICATION CERTIFICATION AND REPORTING



North Facing

ESKOM
DSM
/
Free Basic
Alternative
Energy
Subsidy



Data Logger

LEGEND

- P - POWER CONNECTION
- M - MODEM
- L - LOGGER
- DB - DISTRIBUTION BOX
- CO - CO SENSOR
- CO2 - CO2 SENSOR
- TS/C - TEMPERATURE SENSOR/CEILING
- TS/G - TEMPERATURE SENSOR/GLOBE
- TS/A - TEMPERATURE SENSOR/AIR
- HS - HUMIDITY SENSOR

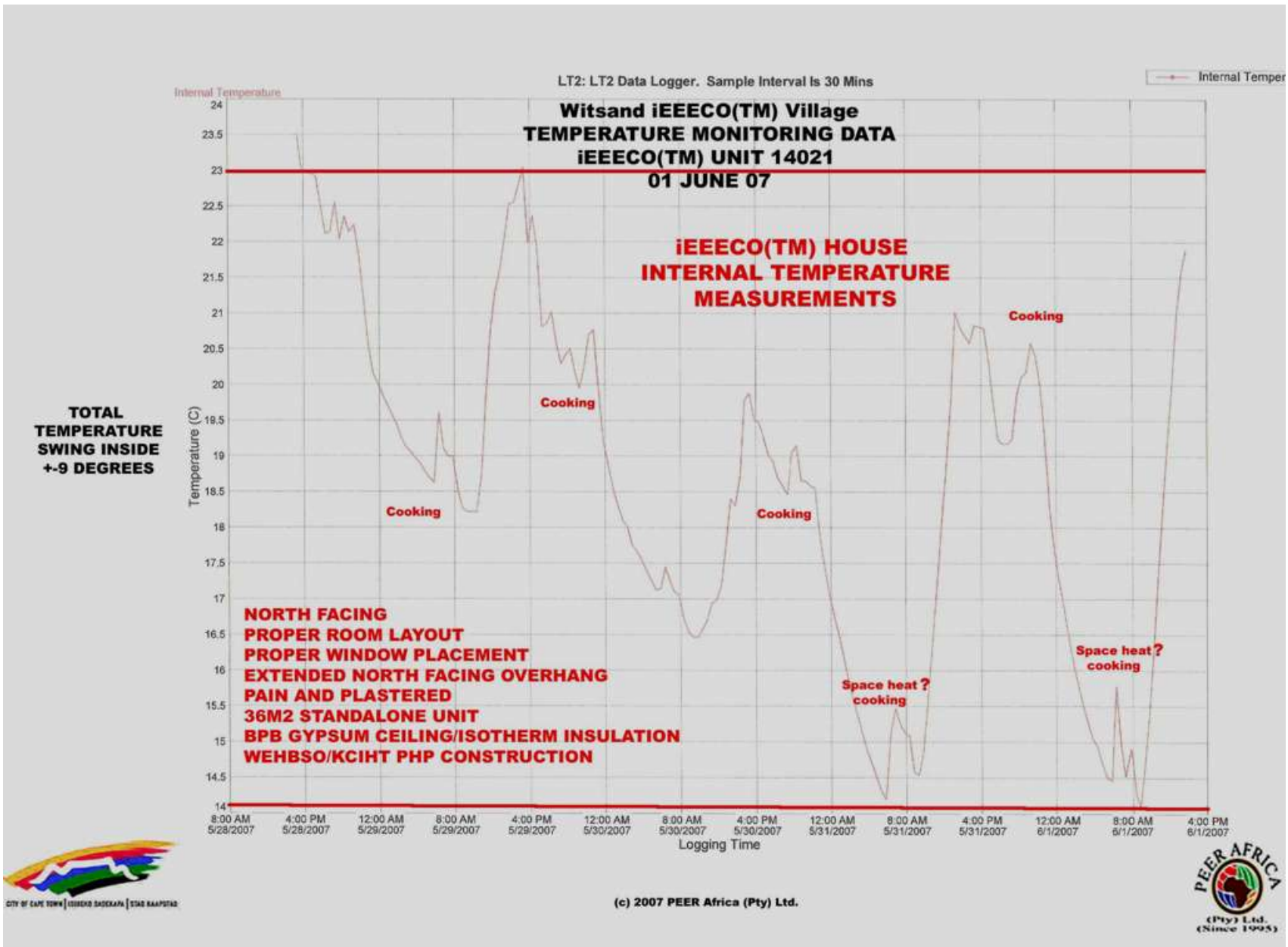
FLOOR PLAN
(ECO-HOUSE 1) SENSOR LAYOUT

Plinth Area: 50m² Window/Plinth Area Ratio: 17.92%

Scale: 0 1000 2000 3000mm



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Project Challenges

1. **Coordination of Various Government Spheres and Departments with single Multifunctional Project**
2. **Alignment of Social Economic Amenities that Complete the Vision**
3. **Bureaucracy Delays in Approvals**
4. **Community Factions Taking Advantage of Delays**
5. **Illegal Wire Connections/Defective Cooking Systems**
6. **Shack Influx Controls and Limited Police Support**
7. **Legal and Contractual Matters**

Project Successes/Innovations 'Thinking outside the box' : Part 1

- 1. Launched integrated iEEECO™ awareness within normal Government procedures without any significant outside funding.**
- 2. Partnership with Eskom DSM M&V to prove lower energy and water consumption.**
- 3. Created link to Demand Side Energy Management projects in the region during Cape Energy Crisis – Jobs created and additional training achieved.**

UNFCCC COP 17 DURBAN

1. **iEEECO Side Event**
2. **Rural Development Clean Development Round Table**
3. **Clean Development Workshop for Municipal Decision Makers**
4. **SeTAR Cooking Centre**
5. **More**

Local Project Affiliates

VNA Solutions

Lonrho Water

Amathonga Holdings

ASCH/ NADESON Consulting Engineers

(WEHBSO) Witsand iEEECO Housing Beneficiary Support Organisation

(KCIHT) Kutlwanong Civic Integrated Housing Trust (KCIHT)

Informal Settlement Network (ISN)/Shack and Slum Dwellers International

City of Cape Town

Province of the Western Cape

South Africa Department of Energy

South Africa Department of Human Settlements

EnerKey

University of Johannesburg/University of Cape Town/Cape Peninsula

University of Technology

Eskom Demand Side Management

Dumani Architects

Agre'ment SA

Wind Watts Turbines

Mellon Housing Initiative



Eskom

EnerKey



Thank You/Nkosi

WEHBSO

Kutlwanong Civic Integrated Housing Trust

Univ of Johannesburg / EnerKey

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