

28 - 30  
OCT  
2020



While the earth  
has time to heal,  
we'll meet you in the clouds

GREEN BUILDING 2020


[gbcсаconvention.org.za](http://gbcсаconvention.org.za)

CONVENTION



# MAPPING THE PATH TO A SUSTAINABLE FUTURE

## The **ENVIROCRETE** BIOCLIMATIC-BUILDING holistic model

JOIN ME AT THE		28 - 30 OCT <a href="http://www.gbcсаconvention.org.za">www.gbcсаconvention.org.za</a>
GREEN BUILDING	CONVENTION 2020	<b>ROBERTO PANE</b> CTO - International Business Development EnviroCrete Pty Ltd
	 <b>BRAINWAVE STAGE</b>	<b>ENVIROCRETE® BIO-CLIMATIC BUILDING SYSTEM A PRACTICAL WAY TO TACKLING CLIMATE CHANGE AND REDUCTION OF GREENHOUSE GAS EMISSIONS (GHG) IN SOUTH AFRICA</b>

# IMPLEMENTATION of virtuous circular economy synergies for GHG Emissions Reductions



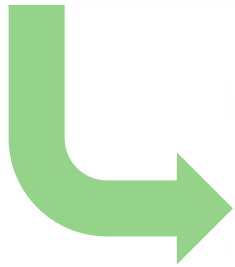
## ABT Construction System & Renewable Material



# ABT Envirocrete Construction - Technology and Innovation



The PERFECT COMBINATION of structural properties of CEMENT & thermal insulation and acoustic properties of WOOD



Treated woodchips become light weight aggregate and batched with Portland Cement are 100% replacement of conventional sand and stone aggregates

# Envirocrete® an Ecological Building System



**Aggregate  
Factory**  
(Treated woodchips)



**Off Site  
Operations**  
Precast panels & Blocks



**Site operations**  
Dry Joint Load bearing  
walls



**Unique Result**  
Solid Energy efficient  
buildings



**Envirocrete Building System**  
Tested and approved fit-for-purpose  
when constructed as specified in  
**CERTIFICATE 2019/578**

**GRÉMENT  
SOUTH AFRICA**  
innovative construction product assessments

# Industrial Manufacturing Options

**HOLLOWCORE SLABS**  
produced on Extruders and  
Slip formers



Standard 20x20x40 hollowcore  
**BLOCKS** produced on  
Automatic Block machine



**CUSTOM PRECAST PANELS**  
produced on panels tray and titling  
table factories



# Envirocrete Construction - Product Range



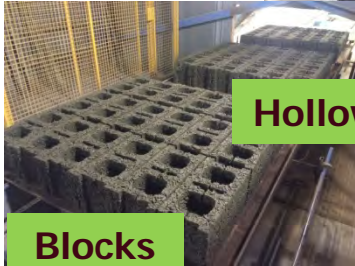
Hollowcore slabs



Dry joint Housing System



Composite Roof slabs



Blocks



Precast load bearing wall panels

- ✓ RENEWABLE MATERIAL
- ✓ Modular
- ✓ Scalable
- ✓ Integratable into existing industry practice
- ✓ Repetitive & consistent quality



Window Sills



Wall copings



Highway acoustic panel barriers



Retainer Blocks & Kerbs



Boundry Walls



Wall Caps

# Envirocrete® Bio-climatic Contructions



# ENVIROCRETE House in Raslouw (Gauteng)

## Thermal performance comparison

### 40 sq.m. std RDP subsidy house



- 140 mm hollow concrete masonry block
- 75 mm concrete slab
- Steel roof sheet
- 12 -15 mm plaster

### 48 sq.m. Bioclimatic house (Passive solar design)



- ❑ EnviroCrete 120 cm modular wall panels 200 mm thick
- ❑ Dry jointed with screws
- ❑ Composite Envirocrete ventilated roof
- ❑ 10 mm plaster

### Significant highlights

- ❑ Savings in electricity consumption charges (Lower monthly **electricity bills can be reduced by 30%-40%**)
- ❑ No need for cooling during the summer
- ❑ Decrease of thermal energy requirements in winter for heating of about 32%,
- ❑ Comfortable dueling conditions at all times

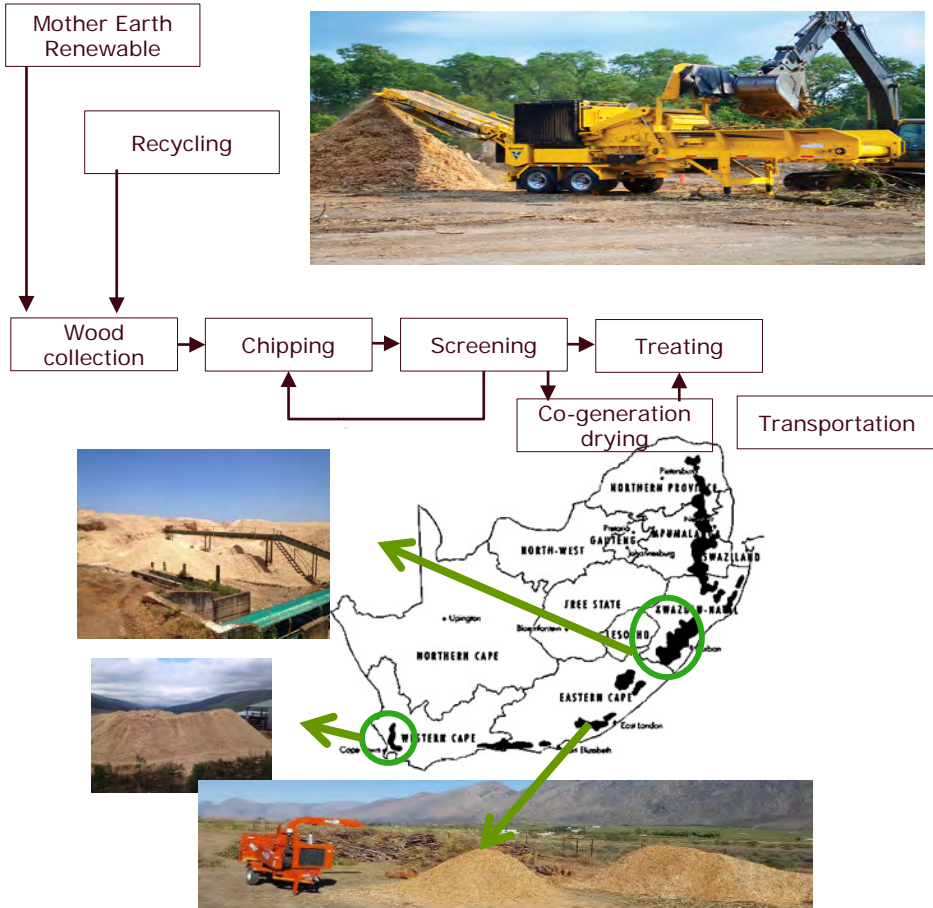
	Description of expenditures per annum	ZAR/annum	GJ/annum	kWh /annum	c/kWh (Escm data 2018)	ZAR/annum	% diff.
40 sqm Subsidy House (NHBC Approved)	Average expenditure per year family 3,3 persons	ZAR 103.293,00					
	Household operation running ALL electrical appliances	ZAR 33.621,87		28933	ZAR 1,35	ZAR 39.146,32	
	Space Heating & Cooling in 40 sqm conventional house	ZAR 6.388,16	19,79	5497	ZAR 1,35	ZAR 7.421,31	19%
48 sqm BioClimatic House (EnviroCrete)	Savings introduced on an insulated -bioclimatic house	ZAR 2.555,26	8,33	2314	ZAR 1,35	ZAR 3.123,77	-58%





# Alternative Green Aggregate -South Africa

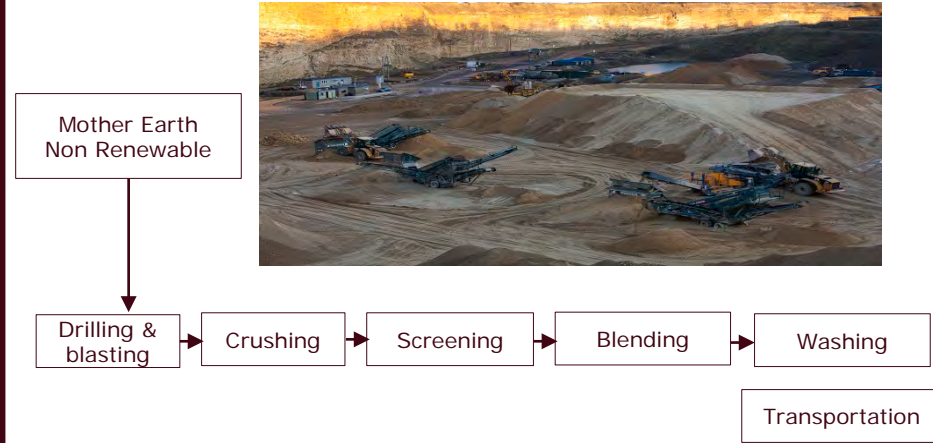
## Forestry plantation management waste wood collection



The total area invaded by alien trees in South Africa is over 100 000 km<sup>2</sup>, which is over 8% country's total area

Scrap pallets & demolition wood available in Gauteng JHB 800 tons monthly (data 2014)

## Quarrying



Raw material Cost (data referred to Q2 2018)

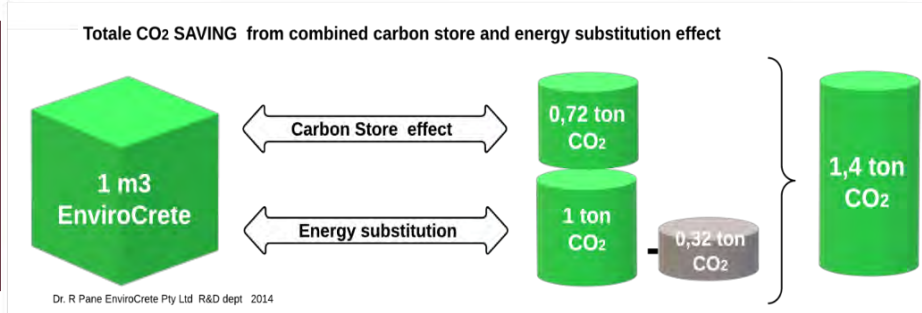
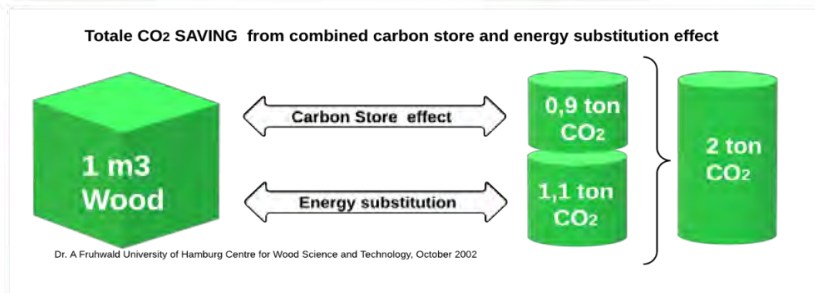
	kg/m <sup>3</sup>	Cost ZAR/ton	ZAR/m <sup>3</sup>	diff %
0-5 mm aggregate	815	ZAR 220,00	179,30	
10 mm aggregate	230	ZAR 265,00	60,95	
Sand	1100	ZAR 220,00	242,00	
<b>Total</b>			<b>482,25</b>	

EnviroCrete Raw produced in South Africa

Chipped wood	300	500,00	150,00	
<b>EnviroCrete® Raw</b>	<b>320</b>	<b>1046,68</b>	<b>334,94</b>	<b>31%</b>

# LOWERING THE CO2 CARBON FOOTPRINT

This can be accomplished by reducing harmful “carbon sources” and increasing ecological “carbon sinks”



- **SUBSTITUTION** of LOW carbon impact materials
- **Removal** through **CARBON STORAGE -SEQUESTRATION**

## ENVIROCRETE Bioclimatic-technology per single house

Energy reduction heating/cooling	11,12	GJ
CO <sub>2</sub> reduction from materials	0,685	ton
Material mass reduction	18,8	ton
Waters from Materials	19,73	m <sup>3</sup>
Water through rain-water harvesting	22	m <sup>3</sup>
Electricity savings	3183	kWh/annum
CO <sub>2</sub> reduction by storage (sequestration)	5,4	ton/kWh/annum
CO <sub>2</sub> reduction (material substitution)	6,6	ton/kWh/annum

WesCape City Development (2019) 200.000 houses	SA National backlog (2017) 2.300.000 houses	
2.224.000	25.576.000	GJ
137.000	1.575.500	ton
3.760.000	43.240.000	ton
3.946.000	45.379.000	m <sup>3</sup>
4.400.000	50.600.000	m <sup>3</sup>
0,6366	7,3209	billion kWh/ annum
1,08	12,42	million ton/annum
1,32	15,18	million ton/annum

# IMPLEMENTATION of virtuous circular economy synergies for GHG Emissions Reductions



## ABT Construction System

- ❑ raises climate change awareness on public health and general well-being of humanity
- ❑ induces changes in life style behaviours and choices
- ❑ **triggers alternative economy models to incentivise renewable and sustainable green business developments and technologies**

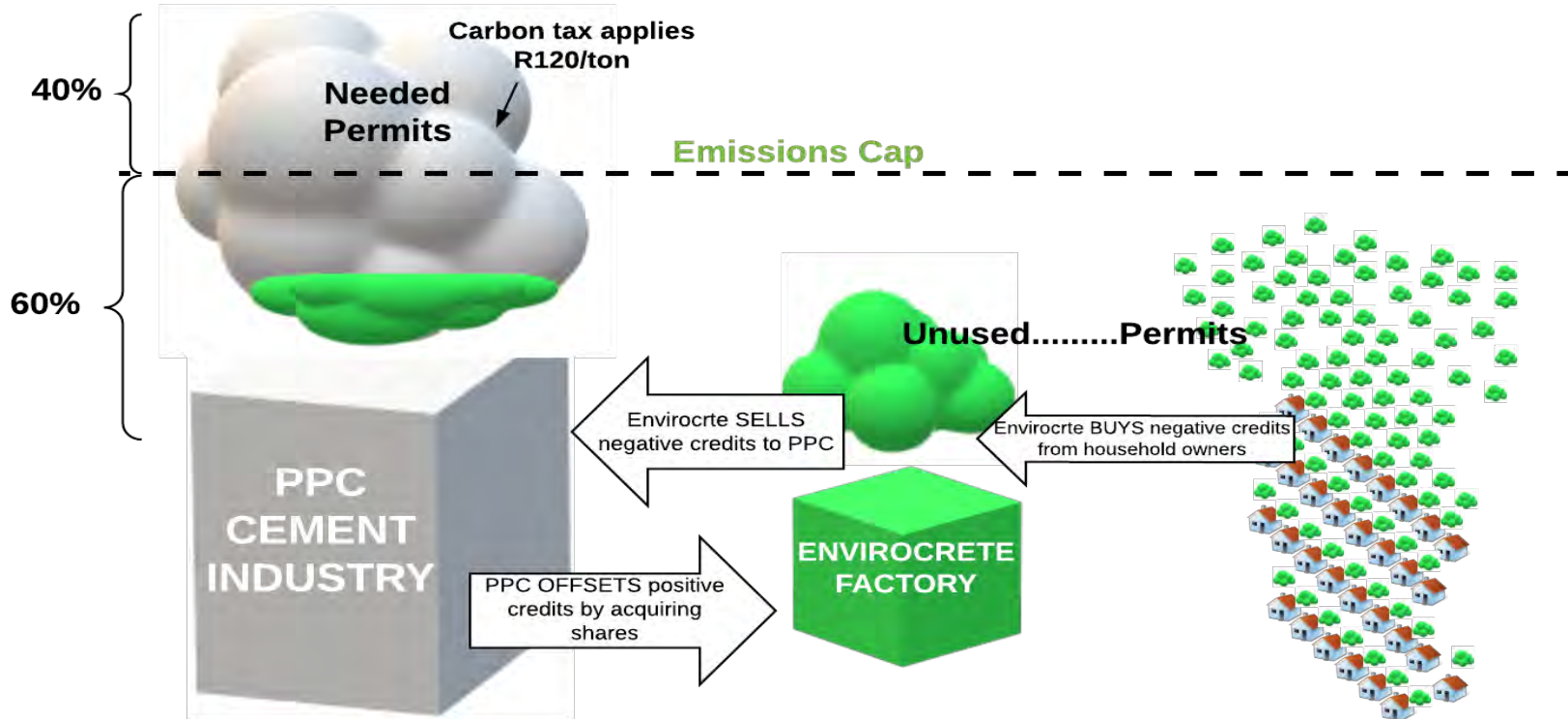
Private Stakeholder  
Home owners

**Legislation & Regulations**  
GHG Emissions Trading Systems (ETS)

Public Stakeholder  
Government

# GHG Emission Trading Systems (ETS)

## Understanding the underlying cap-and-trade scheme



# Market rational to GHG Emission reduction

## Economics

Cost competitive Economic competitiveness compared with traditional construction technologies and most alternative building technologies

## Quality

Superior quality houses in terms of structural stability, flexibility, durability, energy efficiency, and perceived wellness of living, Resistant to fire and earthquakes, with excellent natural thermal and acoustic insulation

## Speed

Fast development based on of-site precast technology and local ready available raw constituent materials , Light weight panels system dry jointed enhance construction speed favorably reduce transport and erection costs and time

## Environmentally friendly

Utilization of scrap wood instead of burning as energy source  
Renewable source of natural aggregate (wood plantations) and dismissal of sand and stone aggregates  
Reduction of energy for running the household heating and cooling  
Global reduction of CO<sub>2</sub> emissions permanent and ongoing.

## R&D, Innovation

Coordinating Product development. to bring to the market the best fabricating housing practices and and viable finance solutions that easily adapt to local requirements and housing needs in each region of the world and concur to reach the net – zero economy balance.

Welcome to get in touch



**Envirocrete (PTY) Ltd**  
**Reg No. 2016/498420/07**  
**609 Eli Street Erasmia, Centurion,**  
**Pretoria, Gauteng South Africa**

**Roberto Pane**

**CTO & Business Development**  
**Italy cell + 39 331 169906**  
**SA cell +27 621710517**  
**Email: [roberto.pane@envirocrete.org.za](mailto:roberto.pane@envirocrete.org.za)**

**[www.envirocrete.org.za](http://www.envirocrete.org.za)**