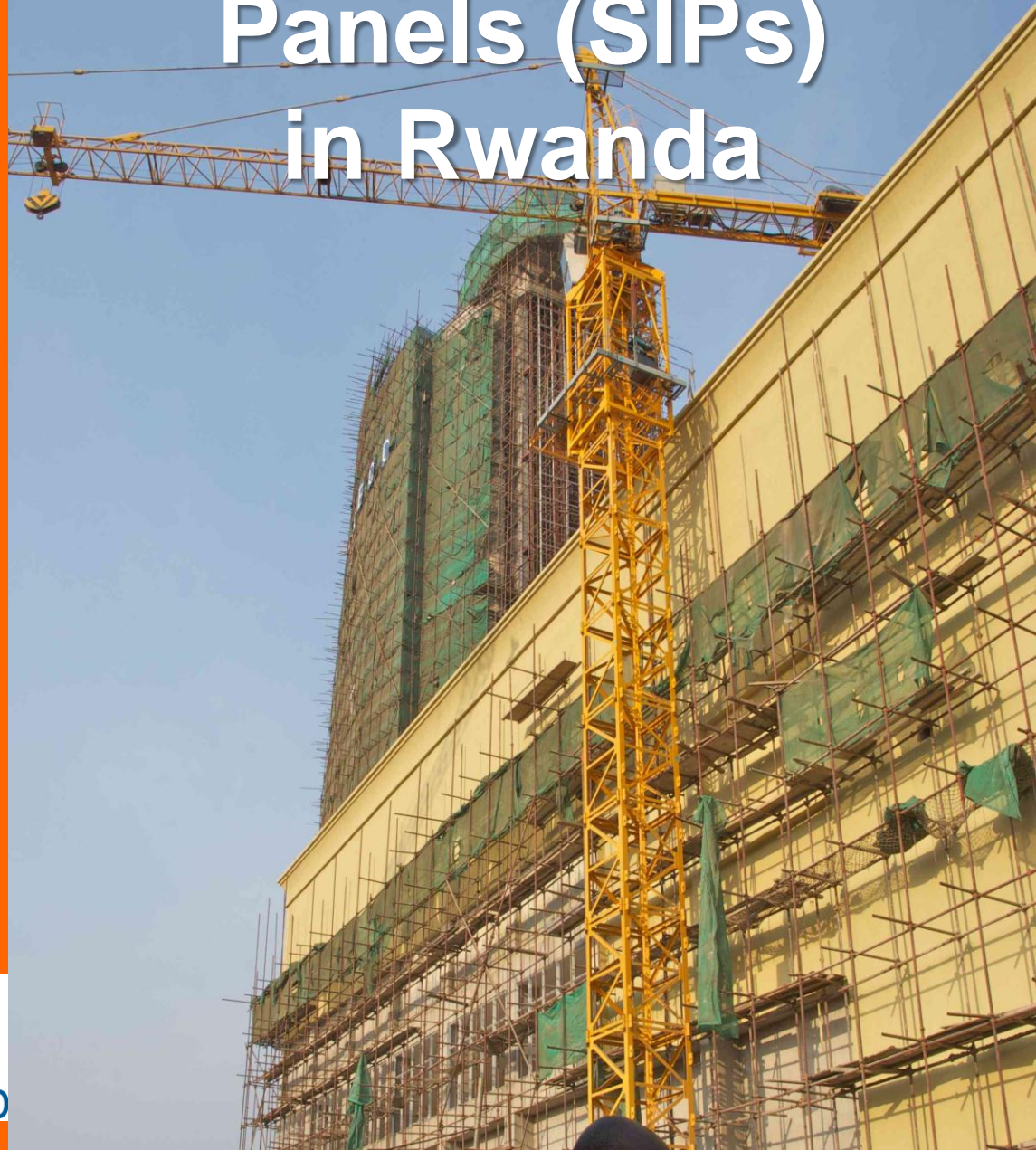


*...the ideal time to
introduce an
innovative new
alternative building
material to reduce
costs and
environmental hazard*

Structural Insulated Panels (SIPs) in Rwanda



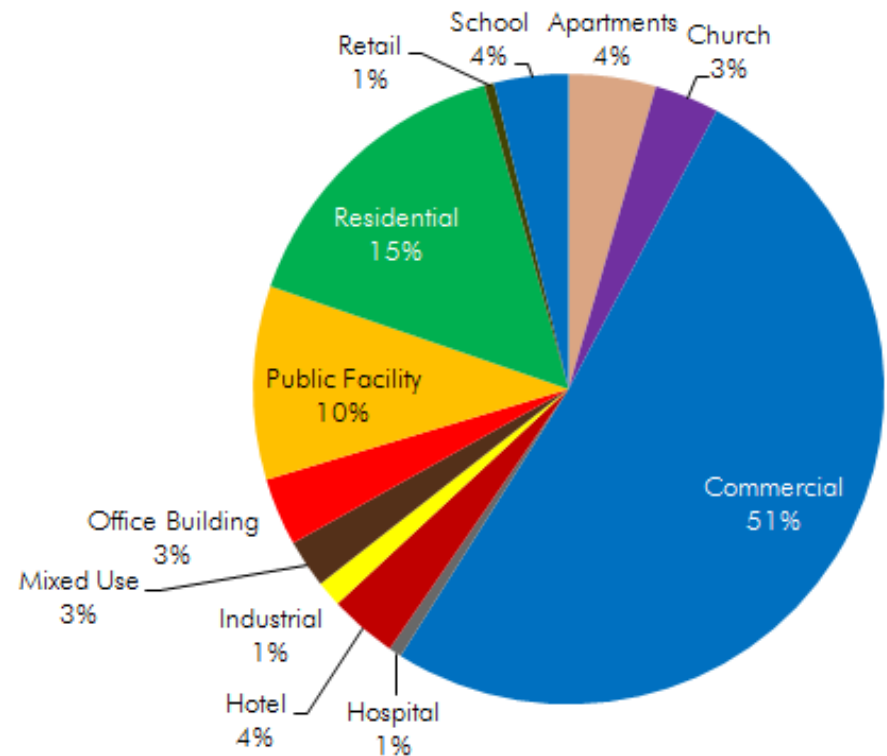
Construction in Rwanda is Big & Growing



Trends in construction & materials:

- ▶ Construction material is the **largest and fastest growing** component of Rwanda's manufacturing sector
- ▶ **51% of recent investments** in the manufacturing sector have been in the area of building materials
- ▶ Construction spending in Rwanda **grew 24% (to 500 million USD)** between 2010 and 2011
- ▶ Construction permits issued: see adjacent chart ☐
- ▶ Commercial buildings and hotels have dominated recent building
- ▶ There are over \$204 million USD worth of building material investments expected in 3 years

Construction by Building Type



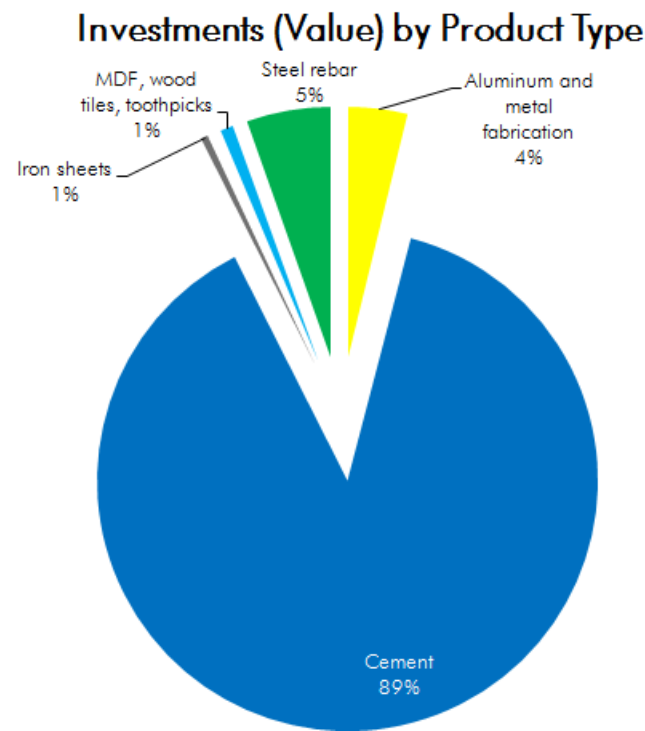
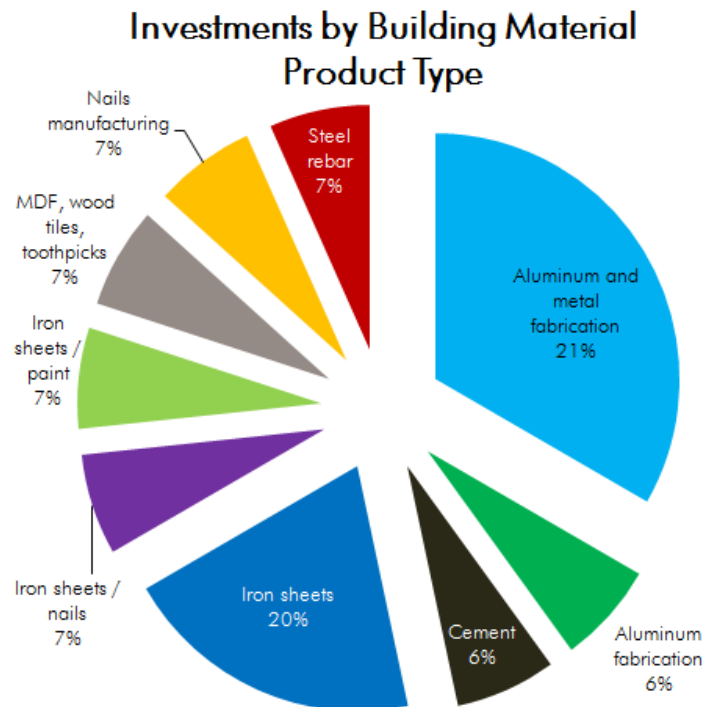
Local Dynamics Attract Investment in Manufacturing



20 Rwandan manufacturers reveal key features and trends:

- ▶ **25% (5)** have other production facilities in the region
- ▶ **70% (14)** have expatriate management
- ▶ **50% (10)** are exporting (Burundi and Eastern D.R.Congo)

Significant new investments committed in the sector...



Building Materials: Time to Decrease Reliance on Concrete



- Rwanda imported 160 Million USD in building materials in '11
- Cement represents the largest segment of building materials (by value) imported annually into Rwanda*

Import/Export Data

Building Material	Import		Export	
	Value ('000 USD)	Volume (MT)	Value ('000 USD)	Volume (MT)
1 Cement	50,629	263,796	936	4,229
2 Metal rolled sheets (iron/steel-roofing, fencing, etc.)	33,494	30,931	292	261
3 Rebar	31,549	26,896	851	1,157
4 Electrical cables (copper and aluminum)	31,000	3,540	54	27
5 Hollow sections and profiles	12,433	10,301	10	7
6 Paints, glues, and varnishes	10,648	4,707	87	63
7 Bitumen (sealants, wrapping, caulking, etc.)	9,665	12,975	289	959
8 Plastic products (PVC, flashings, gutters, etc.)	8,667	4,437	61	18
9 Sheet glass	3,928	3,938	-	-
10 Ceramic tiles (glazed and unglazed)	3,926	13,578	3	6

**trade data from 2011*

- ▶ Local cement production capacity is nearing 800 MT/year

Cement is relatively expensive, heavy, often imported and not considered good for the environment

Current State of Housing Market (in capital, Kigali)



► Trends in construction & materials:

- Kigali currently has 223,000 dwelling units of which 114,000 are in good or upgradable condition
- Kigali population in 2011 was approximately 1 million
- There are approximately 1,000 new homes added each year in the formal market
- Only 3.8% of the population currently has access to mortgage financing (households with income of \$1,450/month or greater)
- Today, it is estimated that between 100 and 130 Million USD of mortgage finance has been issued; the main providers of mortgage finance are BNR, BCR, KCBR, BK, and BRD. A few microfinance institutions such as Zigama CSS are also actively growing their mortgage loan portfolio.

Housing Study: 10 year Projections



▶ Planned Growth in Kigali Housing:

- Kigali is expected to double the number of houses available
- An additional 344,000 dwelling units will be required by 2022:
 - Population is expected to approach nearly 2 million (~4.5/hh)
 - An additional 30,000 homes be built each year
 - Nearly 80% of these for people in the lowest income category (household income of \$460/month or less)
 - 70% are expected to be detached, low-rise row houses
 - 28% are expected to be apartments
 - **Expected to require 200,000 tons of cement**, 13,000 tons of steel bars and 1.7 Million m² of roofing sheets

“Whenever possible, local production of key materials –such as metal roofing and stabilized earth bricks– should be encouraged. Special policies to attract investment to the building materials industry should be formulated. In addition, alternative and appropriate building materials experimentation and innovation should be of the highest priority. Rwanda should develop its own unique and appropriate construction *materials*.” – *Housing Study, 2012*

Housing Plans: Cost & Material Implications



▶ Recommended Housing per Market Study:

• Row House

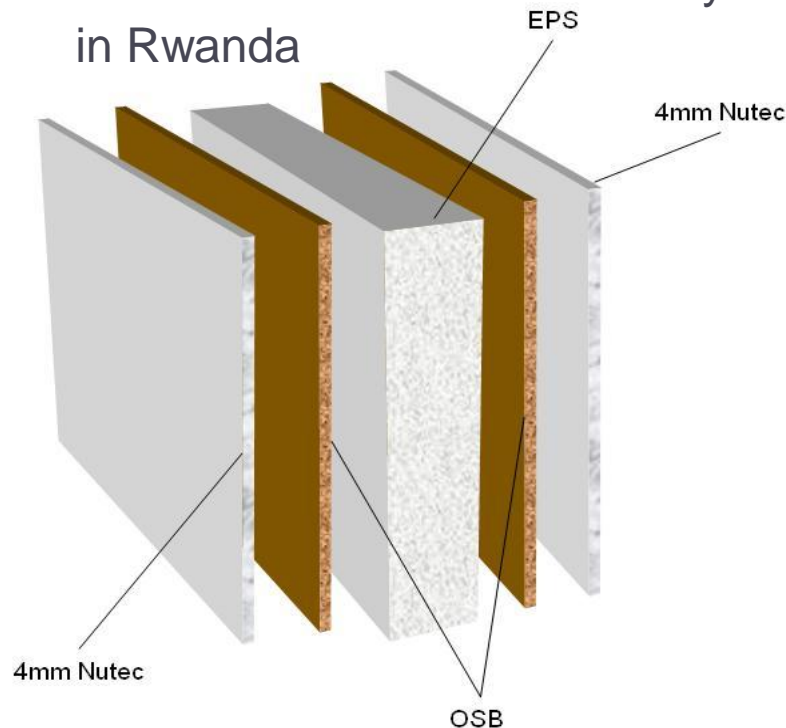
- ~20% of new dwelling units added by 2022
- Preferred option for single/multiple occupancy; single or multi-storey structure
- Suitable for households with monthly income of 600,000-1,500,000 RWF (\$1,000-2,400 USD)
- Employs “hybrid” technology (concrete + soil as with hydrafoam interlocking blocks)
- Meets focus group preferences for privacy, security and convention

• Apartment

- ~10% of new dwelling units added by 2022
- As many as 4 storey's
- May also use hybrid technology (with reinforcement)
- Suitable for households with monthly income of 900,000-2,500,000+ RWF (\$1,500-4,000 USD)

Innovative & Alternative: Structural Insulated Panels

- ▶ The most compelling new building material
 - Affordable concrete alternative, durable and with strong/conventional aesthetic appeal
 - Current demand already identified (4,000 houses for RSSB + 250 houses for Zigama CSS)
 - Current manufacturers already identified (and active in Kenya); prototypes built in Rwanda



Structural Insulated Panels: Affordable AND Durable



► Cost Savings + Durability = SIP Construction

- **Cost savings** over conventional cement construction estimated at **22%**
- **Housing Market Demand:** as many as 30,000 new homes are required in Kigali; SIPs are recommended for “affordable homes” (in the form of *row houses* or *apartments*) estimated to comprise 30%+ this immense demand)
 - More Rwandan residents will be able to afford “affordable housing” if the building costs are reduced and banks make longer term loans to reward these durable materials

Building Costs: Affordable Home (per Housing Study)	Construction with SIPs (locally produced)	Construction with SIPs (imported)	Conventional Cement Construction
Structural Cost	209.38	228.36	309.27
Finishing Cost	154.64	154.64	154.64
Total Cost (sq. mtr)	364.02	383	463.91
Cost Savings (sq. mtr)	99.89	80.91	-
Total Cost (168 sq. mtr. home)	61,155	64,344	77,937
Cost Savings (168 sq. mtr. home)	16,781	13,592	-

- Consistent with Rwanda’s position as a **regional leader** in innovation and environmental policies inline with ambitious growth agenda

Structural Insulated Panels: Features & Benefits



► Benefits of SIPs:

1. **Fast construction:** SIPs can cut construction time (saving 30%+ labor cost)
2. **Durability:** more than 7 times stronger than timber frame construction; 8 times stronger than traditional construction in the event of earthquake/tremors
3. **Excellent sound proofing:** provide significant resistance to airborne sounds; ensures privacy and quiet
4. **Environmental advantages:** Superior to concrete and conventional methods
5. **Visual appeal:** affordable durability and innovation combined
6. **Low material wastage:** Pre-engineering create less waste; recyclable waste
7. **Design flexibility:** Can be used for a wide variety of applications (floor, wall, roof) to meet design
8. **Temperature moderation:** Ensures a more stable and moderate temperature; locks out moisture, condensation and drafts; no added insulation cost required
9. **Extra space:** does not require roof trusses; smaller walls ensure that more interior floor space is available
10. **Resale value:** given long-term durability of the panels, banks are likely to provide longer term loans and future buyer appeal will remain high

Stakeholders are Aligned



- ▶ **Key Stakeholders:** Given the social, environmental and trade balance implications of such a product, there are many key stakeholders and Government of Rwanda (GoR) agencies to ensure viability and implementation:
 - ▶ Social Security Fund (RSSB) – developer of the largest housing developments underway
 - ▶ Military Bank: Zigama CSS – co-developer of SIPs demonstration units and planned housing development
 - ▶ Rwanda Housing Authority – agency responsible for planning new housing units and encouraging alternative products
 - ▶ REMA – environmental protection agency

**The circumstances and stakeholders are aligned;
GoR agencies can mitigate risks for investors**

The Time for SIPs Investment is Now



► The case for investment:

- Rwanda: ideal business & investment climate
- Construction Boom: significant & growing
- Building Materials in Rwanda: too import dependent & expensive at present
- Alternative Product Opportunity:
 - **Substitute** largest imported material (cement)
 - **Reduce housing cost** (material + labor savings)
 - Adequate **skilled labor** & employment regulations
 - No **competition**
- Urgency: Now is the ideal time to introduce an new innovative product (given affordable housing boom, etc.)

A local factory for local panel production (3 to 7 Million USD Capex) will introduce an innovative building material into the Rwandan market

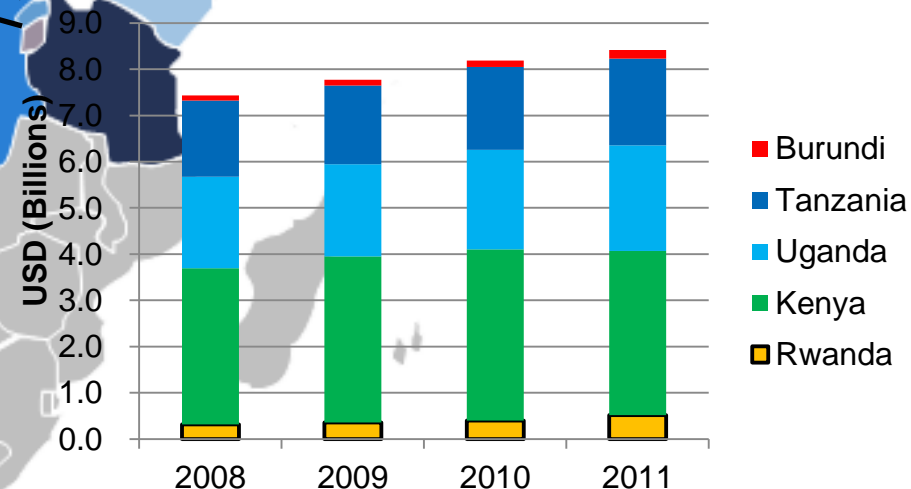
Rwanda is Well Positioned Within a Growing Region



Rwanda:

- Effective government; stable political context
- Strong business environment; low corruption
- Local insight; access to Eastern D.R.C. & Burundi
- Adequate labor pool

EAC Construction Spending Trends



Source: Central Banks of Each Country (and estimates)

Rwanda Offers an Ideal Climate for Investment



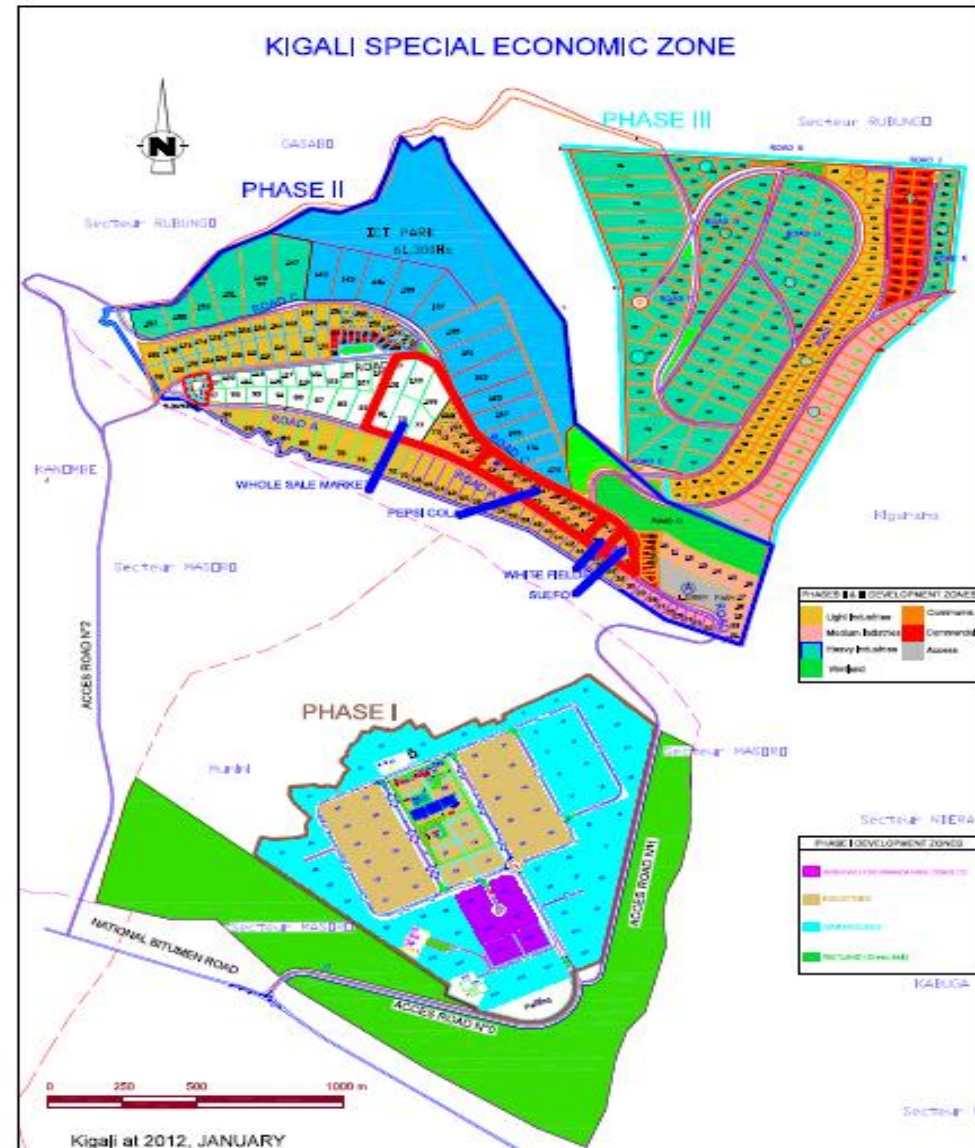
- ▶ Why is Rwanda a compelling business context?
 - 1) **Political stability**; sound rule of law; no tolerance for corruption
 - 2) **Vision 2020**: impressive growth to middle-income country status
 - 3) **8% average year-on-year GDP growth** from 2007-2011 (one of the highest in Africa (and world))
 - 4) **Global Reformer**: ranked #4 out of 181 countries by World Bank *Doing Business Report 2013*, improving the context for starting and operating a business by making 26 different reforms since 2005 **#1 in East Africa** and #3 in Africa: as ranked by WEF Global Competitiveness Report 2011-2012
 - 5) **6-Hour Business Registration**: ranked #8 easiest in the world
 - 6) **New Special Economic Zone** opened; 4 others planned; 30 district industrial areas ready for development

Serviced Sites are Ready for Investors in the Special Economic Zone



Kigali's serviced Special Economic Zone (SEZ):

- ▶ **Phase I:** 98 hectares (ha.) - Fully serviced and fully occupied
- ▶ **Phase II:** 178 ha.
 - ▶ 12 companies have already booked space
 - ▶ Land price: \$32 - \$40 per M²
- ▶ **Phase III:** 134 ha.
- ▶ Additional sites outside SEZ include:
 - ▶ Bugesera zone (serviced): \$15 M²
 - ▶ Rwamagana zone (un-serviced): \$4,750/ha.



Investor Incentives are Available



▶ Investment Benefits:

- Free initial work permit & visa for investor and foreign workers
- Assistance with land acquisition and concessions
- Waiver of import duties, withholding and VAT for imported machinery and raw materials
- Waiver of duties for 1 personal vehicle; personal property import
- Waiver of duties for special vehicles, trucks & heavy machines
- Optional:
 - Construction projects greater than 1.8 Million USD: 10% flat fee for imported materials
 - Income tax “investment allowance” of 40% inside; 50% outside Kigali
 - Tax deductible training and research expenses
 - Tax discounts based on the number of jobs created (900+ jobs = 7% discount)
 - Export earnings may secure tax discounts (5 Million USD exported = 5% discount)

Let us know how we can help you take the next step

Contact us today

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Investment Promotion Office, RDB

Employee

Title/Position

E-mail, phone, Skype



Rwanda: Italian firm introduces low-cost building technology

By In2EastAfrica Reporter | Saturday, June 11, 2011 | By Charles Kwizera, The New Times

Schnell House, an Italian company has introduced a cost-effective housing construction technology in the country.

The new technology is capable of reducing construction cost by half compared to the traditional brick and mortar-house, according to the area manager of the company, Gianmario Conti.

Speaking to The New Times, Charles Haba, a representative of the company in Rwanda, said that the technology would avail affordable houses because no developer presently caters for the needs of the ordinary people.

“In a bid to find a solution for the low income earners, there is need to be innovative and look for alternative ways for building, which are efficient and less costly,” said Haba.

He said the technology would cut back on housing construction costs by 30-40 percent compared to the usual method.

The technology is presently undergoing trial in a joint venture between the Italian company and Zigama Investments, a flagship of CSS Zigama, a credit and savings bank.

The technology uses materials such as galvanised steel, wire mesh and compressed Styrofoam. The houses are built using panels all through.

Conti says that the houses are not only durable, but are also resistant from fire and natural tremors. The house withstands such disasters eight times higher than the traditional houses. He added that the houses are also constructed in a shorter time with less labour.

“A house, which would take six to seven months to be completed using the traditional materials takes us only one month using this technology,” says Conti.

After marketing the technology to the population, Zigama Investments plans to set up a plant to produce panels before embarking on a project to construct affordable houses.

In a telephone interview with the Zigama CSS Director General, Brig. Gen. Geoffrey Byegeka, they plan to put up between 200 and 250 housing units once the public shows an interest.

“We have 13.5 hectares of land in Kinyinya Sector, Gasabo District, where the houses will be built,” he said.

Schnell House is present in other African countries including Morocco, Algeria, DRC, Ethiopia, South Africa, Equatorial Guinea, Kenya, Angola and Sudan.

NHC to build prefabricated materials factory in Mavoko

July 28, 2010 | By Wawunda Mwangasha

“In a move geared towards filling the huge housing deficit in Kenya, National Housing Corporation (NHC) is now making use of prefabricated technology, with plans to put up a Sh700 million plant (\$8.2 Million USD) to manufacture building materials.

The State corporation says the plant, to be located at Mlolongo, will be up and running by mid 2011 – mass producing industrial floor, walls and roofing panels.

“We have signed the contract with the manufacturers of the plant and equipment. We will soon start the design and the construction will start by the end of this year,” the corporation’s managing director James Ruitha, said on Monday.

According to NHC Chairman Bosire Ogero, the use of prefabricated technology will greatly help save on building materials while scaling down the time taken in construction.

“We are not happy with the speed of putting up houses. Releasing an average of 100 houses per year is not enough considering the current demand,” Mr Ogelo said.

Mr Ogelo added that the benefits of prefabricated technology translate into lower cost of purchase for the buyer because of the costs saved from construction and labour.”

Alternative Products: Ideal Options



- ▶ After considering more than ten "alternative" building materials, we have decided to focus our efforts toward innovative products with the following characteristics:
 - a) **Concrete Alternative:** concrete is currently the greatest production cost in home construction; it is expensive, not good for the environment, and often **imported**
 - b) **Affordability:** Consumer spending power and urbanization are fueling the housing boom in Rwanda, yet material costs remain high
 - c) **Leading Innovation:** Rwanda has an opportunity to be a leader in the region, introducing a new building material that offers competitive advantages in the following areas: cost, environmental sensitivity, use of local materials, etc.

Housing Study Plans: Cost & Material Estimates



Technology	Medium	
	Hybrid	
ITEM	RwF/M2	%
I. DIRECT COST	120.728	100%
1. Land	168	0,14%
2. Site Development	4.520	3,74%
3. Building	116.040	96,12%
3.1 Structure	74.610	61,80%
3.2 Finishing	41.430	34,32%
II. INDIRECT COST	54.528	100%
4. Professionnal Services	9.055	16,61%
5. Building Permit	200	0,37%
6. Financial (During Building Time)	21.127	38,75%
7. Sales & Marketing	0	0,00%
8. Developer Margin	24.146	44,28%
Total in Rwf/m²	RWF 175.255,60	
Total in USD/m²	\$288	

Rwanda: Facts & Figures



Population	11 million
Average age	18
Workforce	4.4 million
Literacy	71.1%
GDP/capita (PPP)	\$1,400
GDP growth	8.8%
Inflation	3.9%
Prime lending rate	16%
Industrial production growth	7.5%
Export growth (ytd 11/12)	33%



Map No. 3717 Rev. 10 UNITED NATIONS
June 2006

Department of Field Support
Cartographic Section

Rwanda is the #1 in EAC and Top Business Reformer Worldwide



Category	Rwanda*
Starting a Business	8
Construction Permits	84
Getting Electricity	50
Registering Property	61
Getting Credit	8
Protecting Investors	29
Paying Taxes	19
Trading Across Borders	155
Enforcing Contracts	31
Overall Ranking – Ease of Doing Business	45

*All scores are comparative ranking out of 181 countries featured

Source: WorldBank *Doing Business Report*, 2012

Rwanda Compares Well in University Enrolment for Region

	Burundi	Kenya	Rwanda	Tanzania	Uganda
Land to labour ratio (square kilometres of land per 100 adults)	0.6	2.7	0.45	4.27	1.55
Adult literacy (% for over 15 years)	59	74	65	72	74
Secondary school gross enrolment ratio	18	58	36	-	25
School life expectancy (school end year 2007)	8.2	10.5	8.6	5.3	10
Number of students enrolled in tertiary education (per 100,000 inhabitants)	301	433	730	137	352
Universities in sub-Saharan African (SSA) top ten (excluding South African universities)	None	University of Nairobi (6 in SSA, 3190 in world) Strathmore University Nairobi (10 in SSA, 3556 in world)	National University of Rwanda (7 in SSA, 3330 in world)	University of Dar es Salaam (4 in SSA, 3118 in world)	Makerere University (1 in SSA, 2158 in world)
Emigration rate for tertiary educated (%)	8.5	38.4	26	12.4	35.6

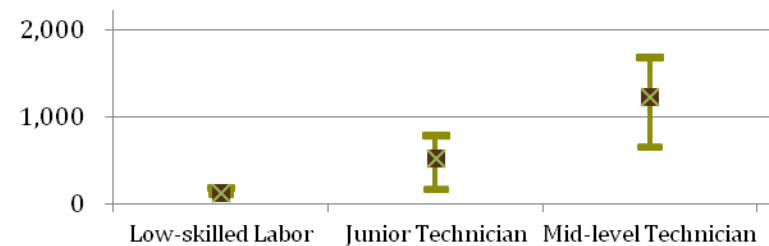
The Rwandan Context for Manufacturing Support



Comparative Analysis by African Country*	Rwanda	Burundi	D.R. Congo	Uganda	Tanzania	Kenya
GDP Real Growth Rate (year-over-year)	8.8	4.2	6.9	6.7	6.7	5
"Doing Business" Ranking - 2013	52	159	181	120	134	121
Population (millions, 2011)	11.7	10.5	73.6	33.6	46.9	43
Literacy rate (% of all 15 yrs +)***	71.1%	67.2%	66.8%	66.8%	69.4%	87.4%

In the region, Rwanda compares well on many of the factors important to manufacturers (e.g. GDP growth, literacy, labor)

Rwanda Manufacturing Labor Costs
(USD monthly gross salary)



Source: Karisimbi Business Partners Survey

Electricity Supplies are Growing with Energy Demands



- ▶ The Government has clear plans to increase energy availability for industry.
- ▶ By the mid 2013, we expect that methane gas, extracted from lake Kivu will increase supply by 25 MW and double the national supply (100MW+) by the end of 2014
- ▶ Additional investments are being made in hydro-electricity which will produce a further 45 MW by 2014
- ▶ DSI Energy Ltd. has plans for \$73 million USD investment for a 30MW solar power project
- ▶ Recent investments in peat energy generation is expected to produce as much as 100 MW additional energy by 2015.
- ▶ The above initiatives will enable the government to increase access to electricity to meet the growing demand of industrial users while expanding domestic supplies.
- ▶ Current industrial rates per KWH are shown in the table below:

Time	RWF	USD
07.00 - 17.00	126	0.20
17.00 - 23.00	168	0.27
23.00 - 07.00	96	0.15

Next Steps



Contact an RDB representative to register your interest and gain added detail



Work with Government of Rwanda stakeholders and agencies to improve conditions for your pending success



Craft detailed business plan



Seize the benefits of being Rwanda's first manufacturer of wire and cable products