















Green Information & Communication Solutions: Trends in Efficient Technology

MTN Group, Nov. 11

INTERNATIONAL YEAR OF FORESTS · 2011

MTN

everywhere you go

MTN at a glance

Total Revenue
$17.4 billion

Group Subs
157 million *

Market Cap
$39 billion

EBITDA Margin
44%

Net Cash
$137 million

Capex
$2.96 billion

Employees
Approx 35 000

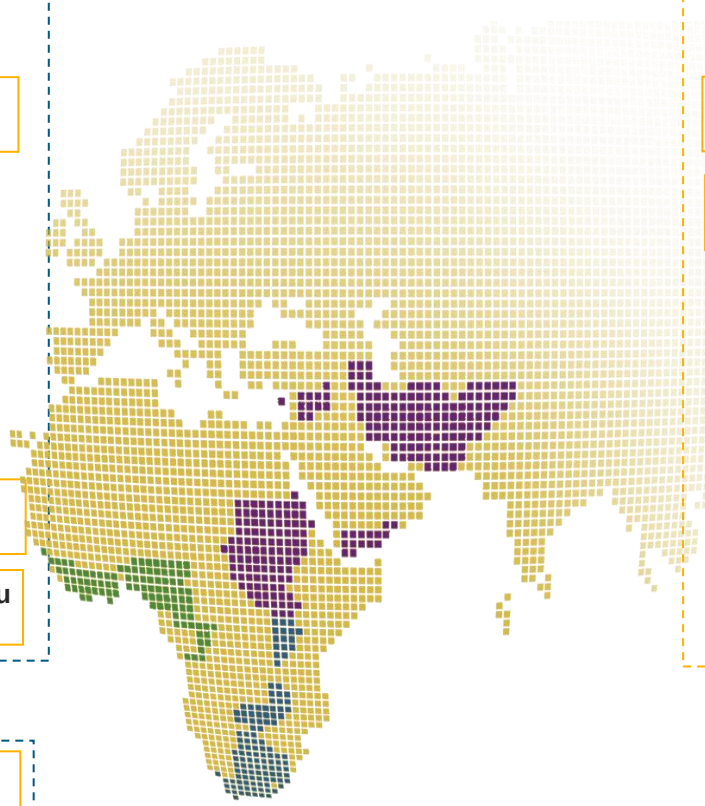
* As at 30 Sept 2011

WECA

- Nigeria
- Liberia
- Ghana
- Cote d'Ivoire
- Congo-B
- Benin
- Guinea Conakry
- Cameroon
- Guinea Bissau

SEA

- South Africa
- Rwanda
- Swaziland
- Botswana
- Zambia
- Uganda



MENA

- Iran
- Yemen
- Syria
- Sudan
- Afghanistan
- Cyprus

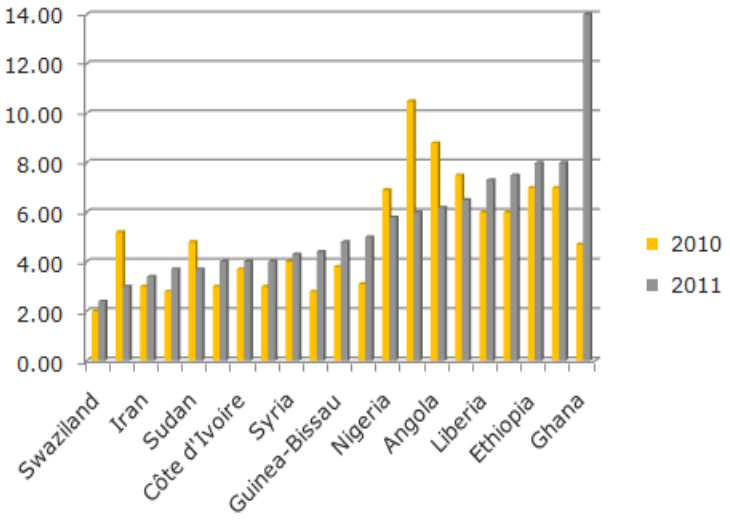
#1 or strong #2 in all 21 markets

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Emerging markets present significant growth opportunities

- Shadow economies are big, and often opportunity overlooked due to poor/ unreliable statistics
- Commercial opportunity historically understated & risks overstated (Nigeria, Iran)
- Media & rating agencies' portrayal of Africa & Middle East is based on self-fulfilling prophesy that emanates from most international news networks
- Lack of infrastructure, products & services a challenge – & opportunity
- Emerging markets have aspirational element, requiring world-class goods & services
- Africa's growth acceleration resulted not only from a resource boom, but also government actions to end political conflicts; improve macroeconomic conditions
    - Currently, few out of 54 African countries are in conflict compared to more than 30 in 1990s
    - Africa reduced its collective inflation from 22% to in the 1990s to 8% after 2000 and decreased budget deficits from 4.6% of GDP to 1.8%
    - Many African countries have privatized state-owned enterprises (e.g. Nigeria privatized more than 166 between 1999 and 2006), allowed more business competition, opened trade, lowered taxes and strengthened regulatory and legal systems
- Oil & other natural resources = for 24% of GDP growth (2000 – 2008); tourism, banking and telecoms accounted for most of growth surge
- Growth acceleration widespread: 27 of 30 largest economies – with significant resource exports and in those without
- Africa's growth, along with Asia: GDP rose during 2009 global

Real GDP Growth in MTN Markets (Source: The Economist)



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However growth is still underpinned by challenges

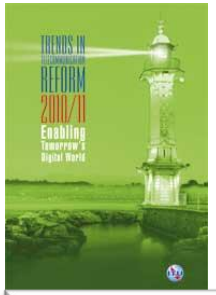
- **Infrastructure**
  - Frequent power cuts, poor roads, lack of public transport and limited public phones
- **Poverty**
  - High unemployment, reliance on informal sector to drive income
  - Erratic income
- **Urbanisation trend**
  - In hope of better opportunities
- **Distribution**
  - Informal distribution plays a key role



How does today's investment by ICTs (and MTN) make a difference? (Environmental focus)

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“ICT innovation encourages a low carbon economy, efficiency, and preservation of our environment”



From climate change to health, to education and personal security; no discussion of major social issues is complete without close examination of the role of ICTs in creating, managing and resolving these issues.

International Telecommunications Union 2011 Trends in Telecommunication Reform Report.



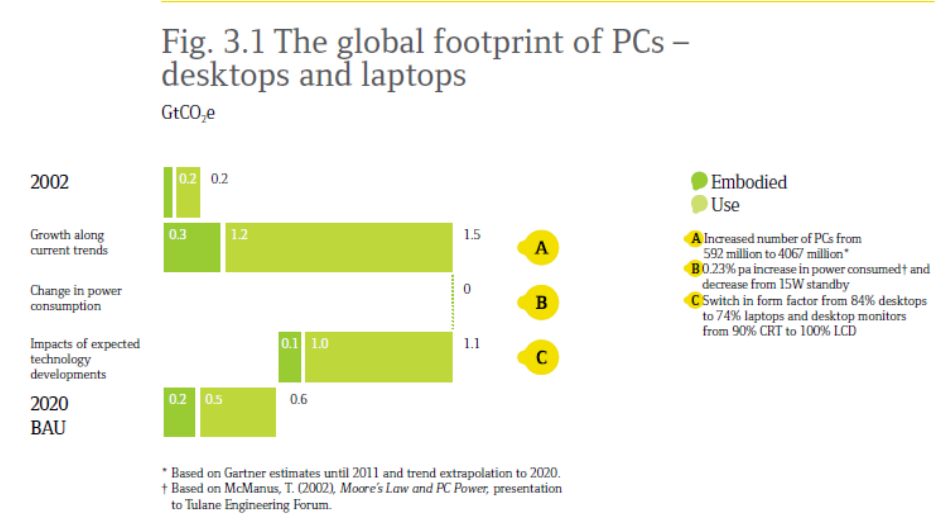
GeSI
GLOBAL e-SUSTAINABILITY INITIATIVE

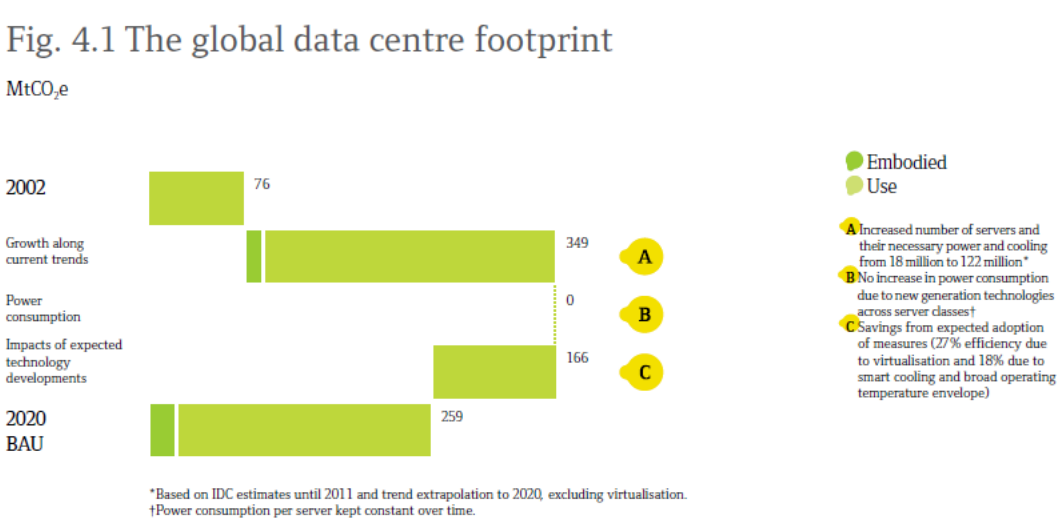
In total, ICTs could deliver approximately 7.8 $GtCO_2e$ of emissions savings in 2020. In economic terms, ICT-enabled energy efficiency translates into approximately €600 billion of cost savings to industries via Smart motor systems, logistics, buildings and grids.

SMART 2020: Enabling the low carbon economy in the information age.

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What is ICT's own environmental impact by 2020?

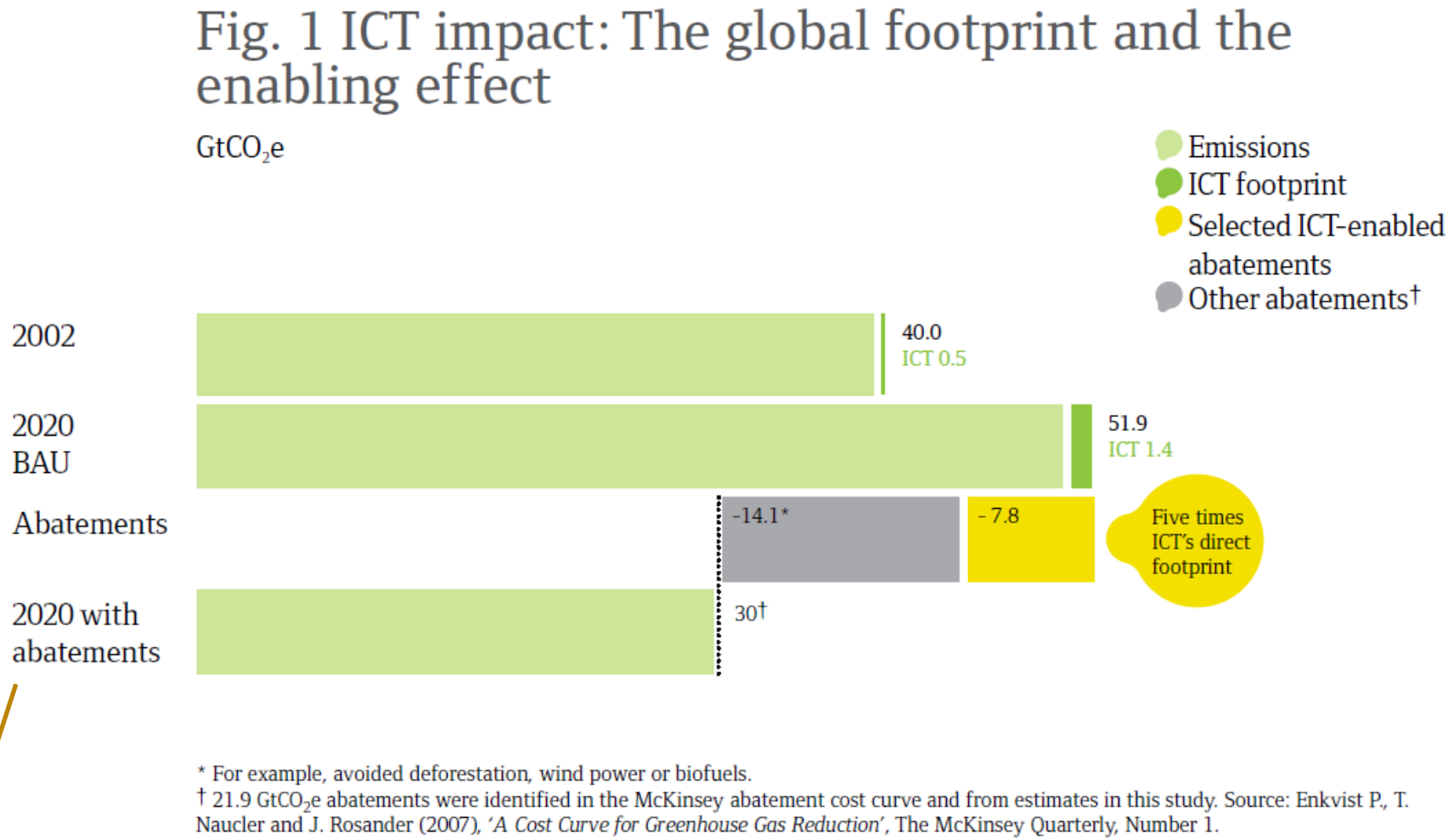




- **Global footprint of data centres and PCs/ laptops, driven by energy consumption triples between 2002 and 2020**
- **Laptops will overtake desktops as main energy consumers; 74% of all PCs will be laptops**
- **Replacing cathode ray tube screens with liquid crystal display screens will reduce energy consumption**
- **Business as usual solutions most effective to reduce energy costs for data centres include:**
  - virtualisation
  - automated temperature assessments and cooling direction
  - free cooling use
  - low voltage direct current use to reduce reliance on uninterrupted power supply
- **Step change solutions include:**
  - Higher adoption rates of virtualisation architectures

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ICT can help other industries reduce environmental impact while maintaining business as usual: 5 x own sector



BAU = Business As Usual
Abatements = initiatives that save costs/ carbon

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ICT dematerialisation*, integration & M2M services can save 7.8 $GtCO_2e$ & €600 bn OPEX by 2020 alone

The ICT Enabling Effect

$GtCO_2e$

7.8 $GtCO_2e$ of ICT-enabled abatements are possible out of the total BAU emissions in 2020 (51.9 $GtCO_2e$)

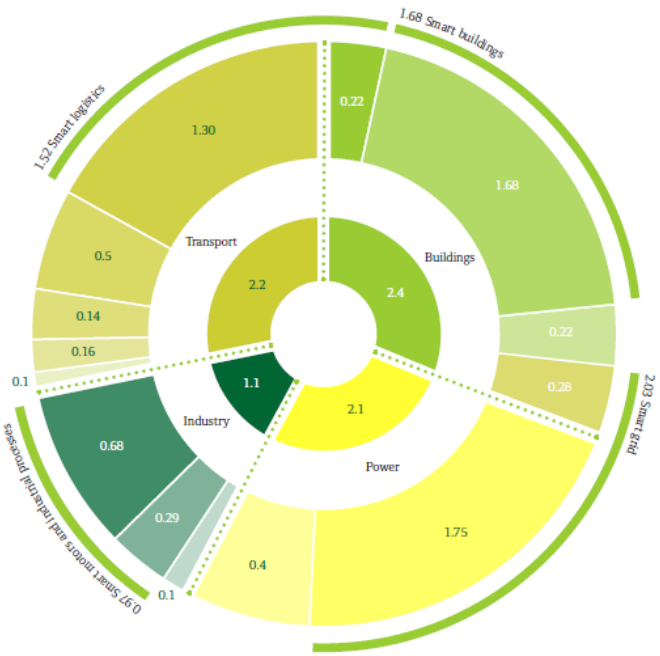
The SMART opportunities including dematerialisation were analysed in depth

Industry
- Smart motors
- Industrial process automation
- Dematerialisation* (reduce production of DVDs, paper)

Transport
- Smart logistics
- Private transport optimisation
- Dematerialisation (e-commerce, videoconferencing, teleworking)
- Efficient vehicles (plug-ins and smart cars)
- Traffic flow monitoring, planning and simulation

Buildings
- Smart logistics†
- Smart buildings
- Dematerialisation (teleworking)
- Smart grid‡

Power
- Smart grid
- Efficient generation of power, combined heat and power (CHP)



*Dematerialisation breaks down into all sectors except power. See detailed assumptions in Appendix 3.
†Reduces warehousing space needed through reduction in inventory. See Appendix 3.
‡Reduces energy used in the home through behaviour change. See Appendix 3.

- **Environmental Savings that ICT can enable in other sectors**
  - **Smart Buildings: 1.6 gT**
  - **Smart Grid: 2.03 gT**
  - **Smart Motors:**
  - **Smart Logistics: 1.52 gT**
- **OPEX Savings that ICT can enable in other sectors:**
  - **€600 bn**

Dematerialisation: replacing physical with virtual

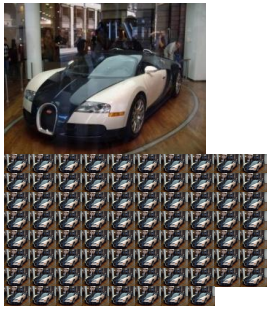
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What does taking 7.8 $GtCO_2e$ from the atmosphere & €600 bn OPEX savings mean?

Roughly, this could equate to the following . . .



Powering 1 million homes in a very affluent area for the next 26 years (how much more would poorer communities on lower consumption benefit?)



800 million x 4 door, 1.6 l vehicles off the road permanently

The ICT Enabling Effect

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Just like a smartphone (communication & IT) smart motors/ grids/buildings/ logistics integrate processes & ICT services

S tandardise

M onitor

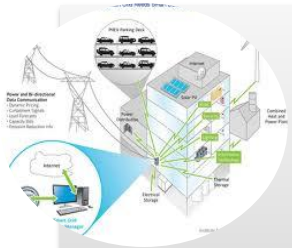
A ccount

R e-think

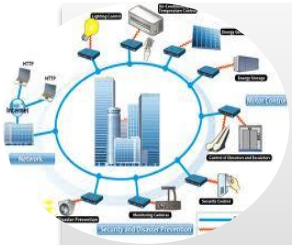
T ransform



Smart Motors are electric machines with integrated drives & controls . Devices communicate with other devices, and with sub-systems and components to enable automation and smooth supply for varying traffic demands, reduce operating costs, increase equipment life and product quality, and improve environmental performance through effective energy management. Already in use in marine, oil extraction, medical, building, renewables, aerospace, safety/ security, etc. sectors.



Smart Grids or the" Energy Internet" use communication technology to optimise predict & dynamically respond to energy demand behaviour for suppliers by consumers, improving reliability, efficiency & electricity grid performance (as well as OPEX & CAPEX). Smart grids move energy transmission, distribution from the 19th to the 21st century: aggregating multiple networks &multiple power generation companies with multiple operators & are deployed in the US, Canada and Europe. Will elec. prices change every few minutes??



Smart Buildings or intelligent buildings integrate building management systems with energy, water, air, and other resource systems via ICT solutions to heat & cool buildings, manage water & air quality, & automate services for human comfort. building, technology, and energy systems. By creating & saving energy for efficient usage, & monitoring other resources, CAPEX, OPEX & environ. benefits are enjoyed. Along with Smart Motors, this technology is already widely deployed globally.



Smart Logistics enable efficiencies in storage & transport. For example by placing radio frequency ID tags on goods companies can control the temperature of goods and avoid transporting half empty trucks. Static & dynamic route planning can further save transport costs & CO_2 emissions through fuel efficient trips.

**Dematerialisation: replacing physical with virtual*

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MTN is growing sustainably

COST & GHG SAVINGS: Energy & Waste Efficient MTN Operations



Network Sites

Engineered solutions:
- Modernisation of BTS equipment
- Power saving features and Intelligent Radio techniques
- Deep cycle batteries
- Hybrid power
- Free cooling
- Raising operating temperature
- Smart metering
- Site fuel management
- Diesel combustion enhancer
- Energy, battery, weather variable monitoring
- Combined heating/ cooling
- Site sharing

Alternative Energy:
- Solar, wind, biogas, natural gas, hydro, hydrogen fuel cell



IT Data Centres

- Adoption of The Green Grid standard for constant monitoring of Power Usage Effectiveness (PUE) Data Centre Infrastructure Efficiency (DCIE) metrics to make energy efficiency improvements
- Adoption of European Union Code of Conduct for Data Centre (incl. Building & power efficiency)
- OPCO environments clustered into regional shared service hubs to achieve greater efficiencies
- Infrastructure consolidation & virtualisation to save space & reduce cooling (and other) costs



E-Waste

- Cellphones & accessories, network equipment (e.g. Batteries, air-cons), IT equipment waste management in PPP for green job creation & reduced waste to landfill
- Pilot project in SA before rollout to other countries: e-waste from customers, general public & consumers

INNOVATION, REVENUE, COST & GHG SAVINGS: Enabling Sustainability in Other Sectors









We are savings costs & reducing our own environmental impact

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MTN is growing sustainably *(cont.)*

COST & GHG SAVINGS:
Energy & Waste Efficient
MTN Operations



We are helping other industries save costs & reducing their environmental impact

INNOVATION, REVENUE, COST & GHG SAVINGS: Enabling Sustainability in Other Sectors



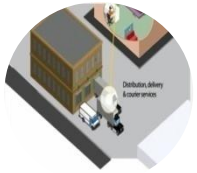
Water Quality Monitor

- Telemetry solution: monitor business' water usage, real-time reporting
- Machine 2 Machine device connected to water meter, using meter's standard pulse outputs, to report hourly, daily, weekly, monthly annual consumption.
- Flow rates & patterns for consumption configuration
- Alarms with escalation via SMS and email



MTN Mobility: Smart Metering

- M2M remote control: corporate and industrial
- customers improve energy efficiency



MTN Mobi-Fleet: Fleet Monitoring

- Track vehicle movement in real-time; monitor fuel cap
- and ignition, etc.

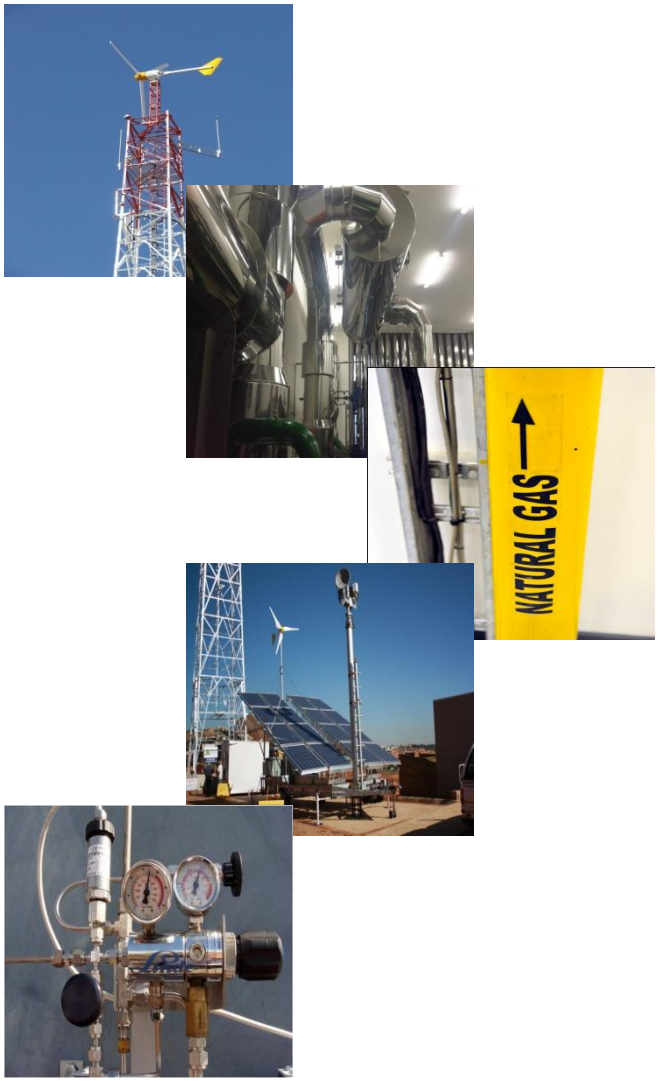


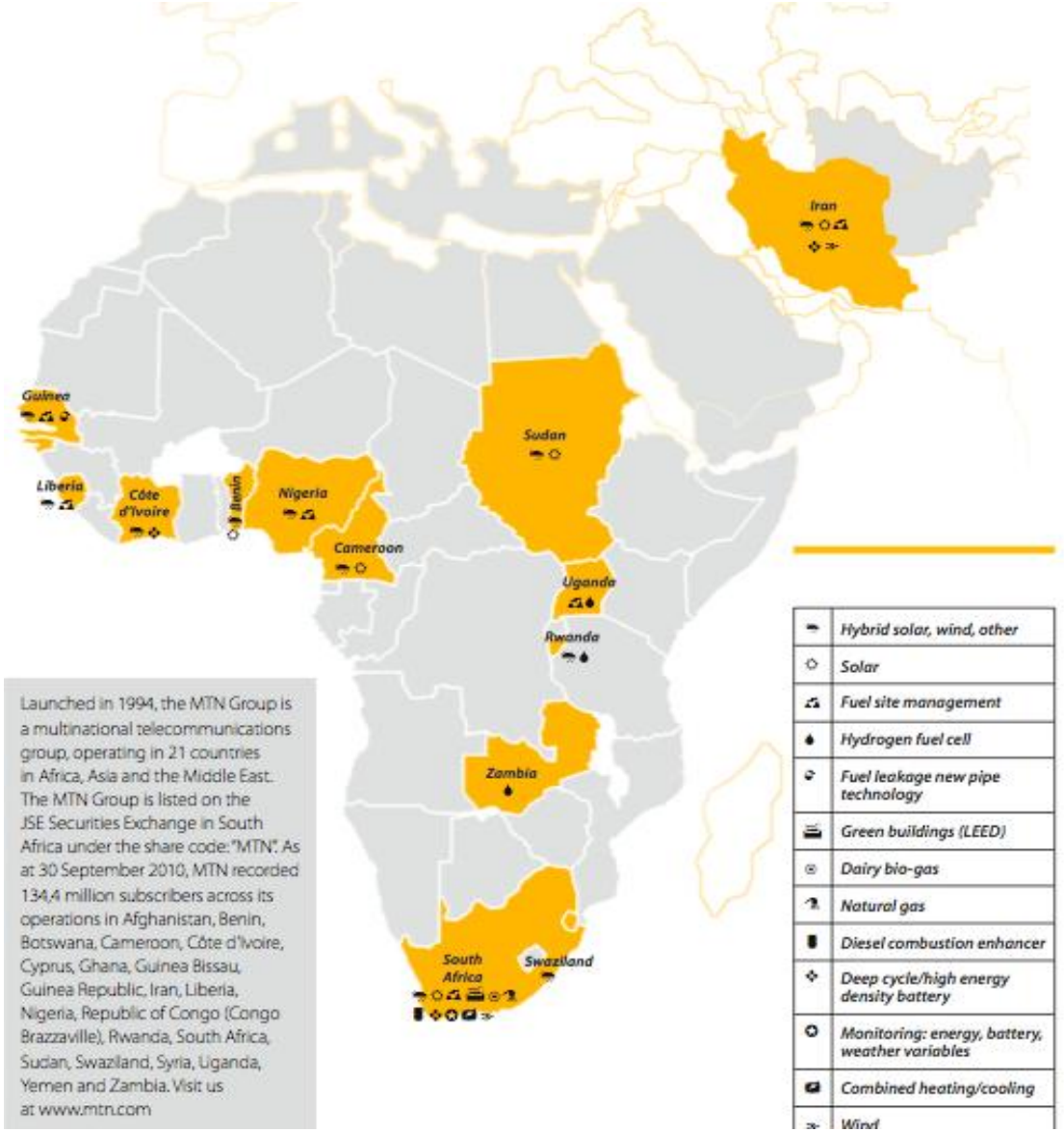
Server Virtualisation

- Reduce capital expenditure (CAPEX) associated with buying, storing and maintaining physical servers
- Instead of businesses investing CAPEX & OPEX for data centre technology & space, MTN hosts these services for virtual access
- (In addition to economic benefits) Saves electricity for data centre power & cooling requirements – helps companies meet their own sustainability strategy

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MTN has implemented energy-efficient, low emissions networks in over 12 of its 21 countries of operations

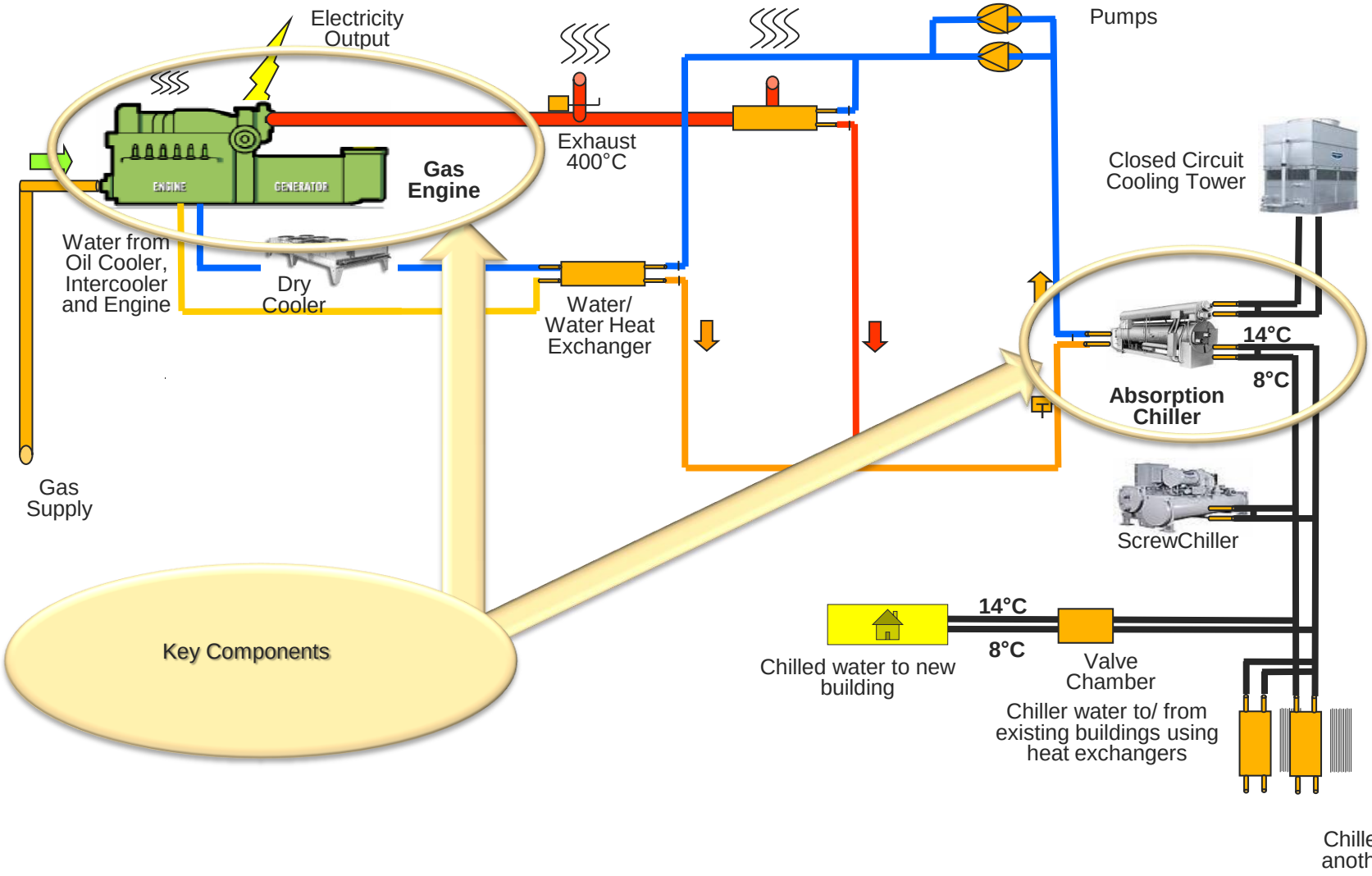




Launched in 1994, the MTN Group is a multinational telecommunications group, operating in 21 countries in Africa, Asia and the Middle East. The MTN Group is listed on the JSE Securities Exchange in South Africa under the share code: "MTN". As at 30 September 2010, MTN recorded 134,4 million subscribers across its operations in Afghanistan, Benin, Botswana, Cameroon, Côte d'Ivoire, Cyprus, Ghana, Guinea Bissau, Guinea Republic, Iran, Liberia, Nigeria, Republic of Congo (Congo Brazzaville), Rwanda, South Africa, Sudan, Swaziland, Syria, Uganda, Yemen and Zambia. Visit us at www.mtn.com

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MTN SA's CER 2 MW tri-gen plant uses natural gas to generate power; recovered engine heat generates cooling



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The tri-generation plant demonstrates going green makes business sense: ↓ OPEX $ 227k Y1; 17,5 tonCO_2e p.a.





Indicators	Unit of Measure	Note	Year to 0	Year 1	Year 2	Year 3
CAPEX	ZAR		22,000,000	0	0	0
Production cost/kwH: methane	ZAR/kwH			0.62	0.62	0.62
Production cost/kwH: diesel (if used)	ZAR	1		2.98	3.28	3.58
OPEX Savings	ZAR			1,500,000	3,200,000	5,300,000
Tri-Gen Plant GHG emissions	tonnes	2		2,700	2,700	2,700
Avoided Emissions (Grid Power)	tonnes	3		17,520	17,520	17,520
Avoided CO_2 tax liability	ZAR	4		1,314,000	1,489,200	1,752,000
Illustrative CO_2 CDM credits (value)	ZAR	5		980,000		

The emissions avoided by MTN SA's 14th Avenue tri-generation plant is equivalent to taking 140,000 average-sized cars off the road for 2 hours, every year.

1. Based on an average annual increase of 10%, and discounts spot-pricing (base rate of R2.98 for Year 1 applied for illustrative purposes)
2. Tri-gen Plant Emissions are lowest of 3 options MTN may have had viz. Grid power (if available from Eskom), or diesel
3. If MTN had used Eskom power, it would have generated an additional 17,5 tonnes CO_2e
4. By avoiding additional emissions, MTN has avoided a potential carbon tax liability. Currently under finalisation for public commentary by National Treasury, proposed rate in year 1 is R75/ ton emissions. Illustrative rate of R75/ ton year 2, R100/ ton year 3

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MTN SA's offgrid energy sites do more than secure cost-effective, green energy: communities are connected

Some of MTN' South Africa's offgrid sites



Kleinaarpan

- **120 km North of Upington in the Kalahari**
- **Solar power :** 12kW
- **Wind power :** 7.5kW
- **Fuel cell :** 5kW
- **CO_2 savings :** 18.9 ton p.a.
- **OPEX savings :** R 21,462 p.a.



Riemvasmaak

- **140 km North West of Upington in the Kalahari**
- **Power :** Solar generator
- **Solar capacity :** Installed – 6.6kW
- **Power :** Wind generator
- **Wind capacity :** Installed 7.5kW peak
- **CO2 savings :** 34.8 ton p.a.
- **OPEX savings :** R39,530 p.a.



Nederlea

- **80km North of Upington in the Kalahari**
- **Power :** Solar generator
- **Solar capacity :** Installed – 6.6kW
- **Power** : Wind generator
- **Wind capacity :** Installed 3kW peak
- **CO2 savings :** 27.8 ton pa
- **OPEX savings :** R31,646 pa

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From Iran to Nigeria, MTN operations are finding that environmentally-efficient networks have a major impact

- Well-developed infrastructure
- High poverty levels
- Large urbanisation trend
- Informal distribution channels
- Low risk-taking culture
- More 4 million MTN subscribers



- **Meeting global requirement for accessible, quality network services and OPEX cost and GHG reduction through efficient network design and modernisation, reduction of diesel generators, solar and wind trials and air-conditioner use optimisation**

- **MTN is making telecommunications access and services to 850 villages across Nigeria of which 280 BTS sites covering 350 villages, each of which is powered by hybrid/solar panels to guarantee steady network. Fully meshed satellite network technology = world first**





- 2, 101 cities and towns
- Over 10, 000 villages and communities
- Highways spanning the 36 states and the Federal Capital Territory
- 83.9% geographic coverage (June 2010)
- 84.6% population coverage (June 2010
- 1, 422 live 3G sites to date
- 3G has enabled the launch and rapid growth of mobile internet and other data services

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Smart buildings? We're working towards US Standard Leadership in Energy & Environmental Design (LEED) status by the end of this year

Target 15%-30% energy consumption reduction, reduce building environmental impact (water efficiency and indoor environmental quality), enable a more sustainable and "green" environment



Savings bet. Jan '08 and Jan '11 over R1.1m per month (absolute savings in spite of energy consumption increase and national price increases)

- 84 smart energy meters
- Heat absorbing window protective film
- 786 lighting sensors
- Solar lighted car park
- Hot water low consumption area switch-off
- E-boilers instead of kettles
- Cool-roofs (partial)
- Aircon switch-off in off-peak
- LED lighting
- "Green" paint, oxygen-emitting plans
- Total waste management solution including on-site composting
- Tri-generation powered data and test centre

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From SustainAbility to SustainAgility a clear case economic, environmental & social for MTN's investment

If ICT pays attention to environmental issues:

- ☞We save OPEX in our own businesses
- ☞We save carbon tax penalties and can access new sources of cheaper investment
- ☞We generate revenue for our own businesses through new solutions for other industries
- ☞ We survive and grow in the new, uncertain, complex operating world we face



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For more information about MTN and green information and communication technologies:

- **MTN Carbon Disclosure Project report: www.cdproject.net**
- **www.mtn.com/sustainability**
- **www.mtn.co.za**











Thank You

everywhere you go