

Tokyo Lights Africa 2011

November 18, 2011

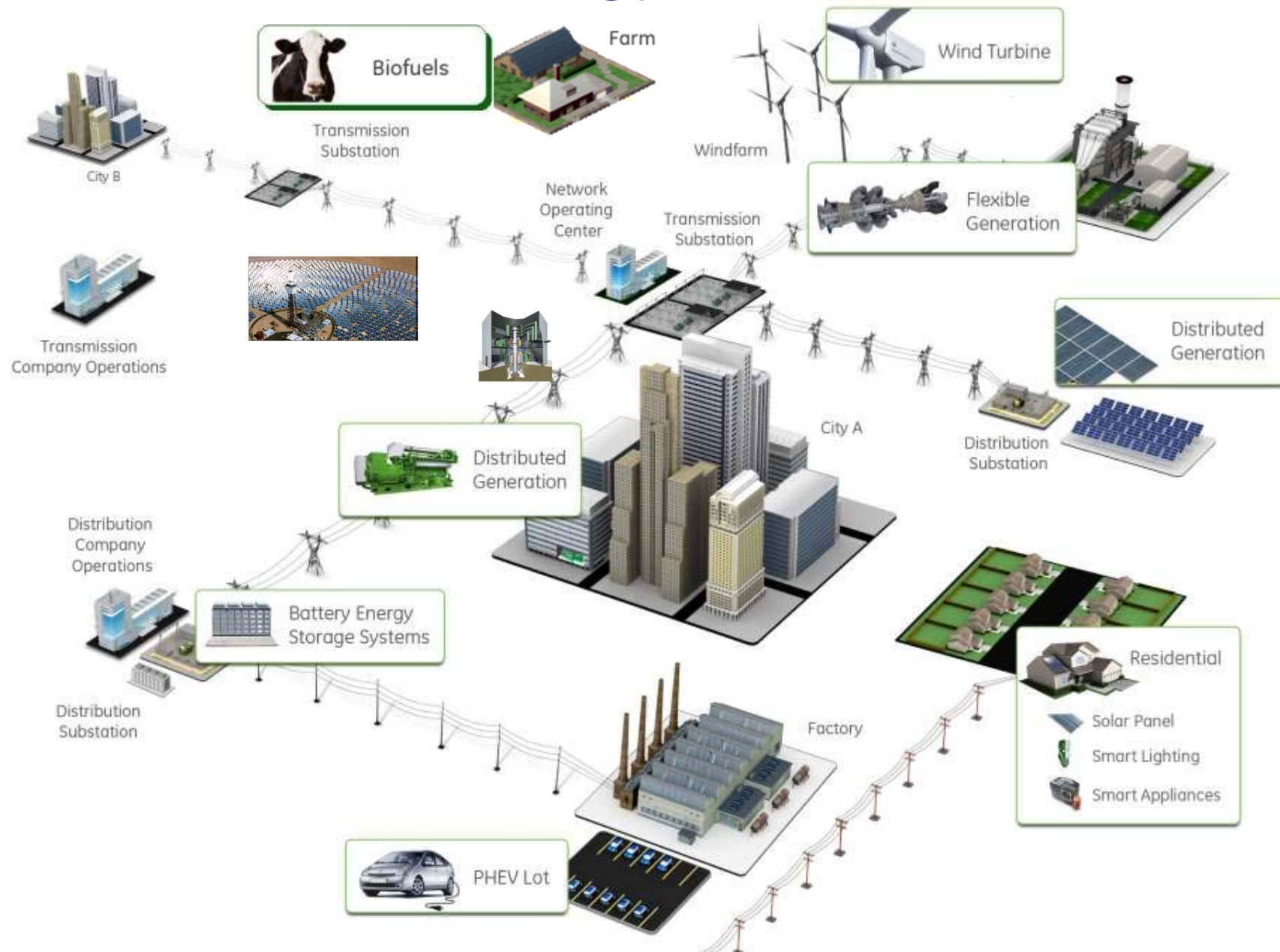
Smart Grid Deployment for Africa

Hiroshi Suzuki
GE Digital Energy



imagination at work

Smart Grid = Energy + Information



Five Pillars of Smart Grid

Asset Optimization

Transmission Optimization

Distribution Optimization

Human Resource Optimization

Demand Optimization

**Working together to
provide customer
solutions**



Asset Optimization



Hydran

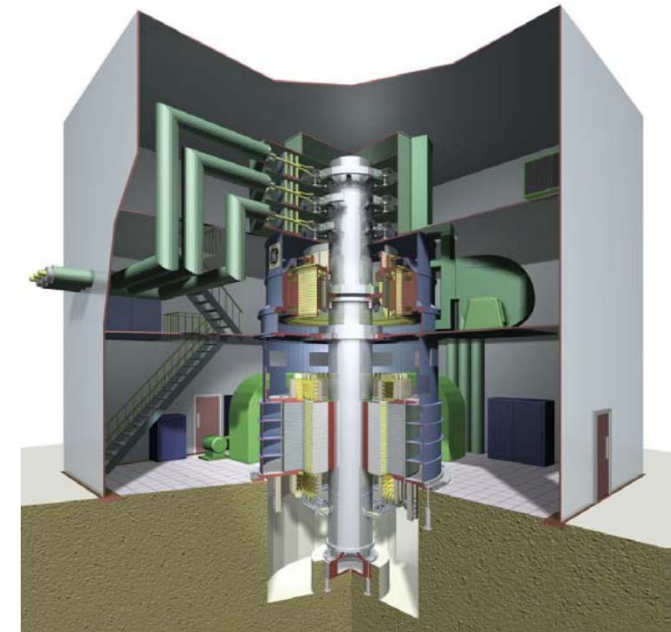
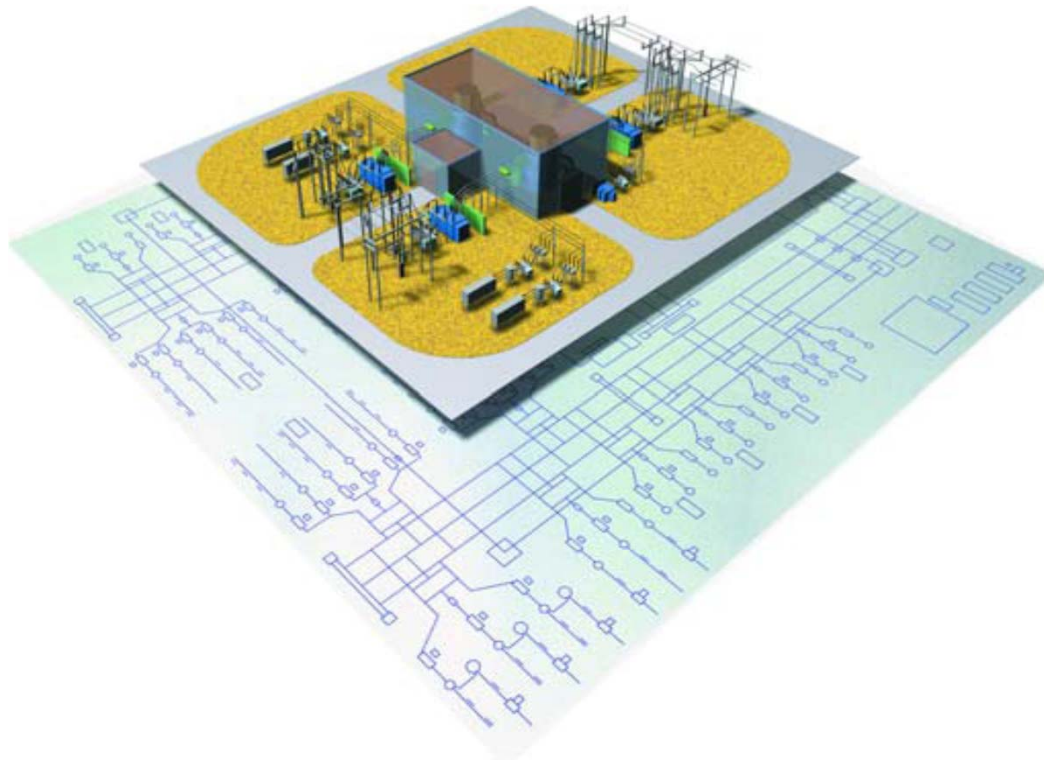


Aging transformer on-line
Monitoring and Diagnostic
Based on condition based
maintenance



Transmission Optimization

Systems are interconnected by
VFT(variable frequency transformer)

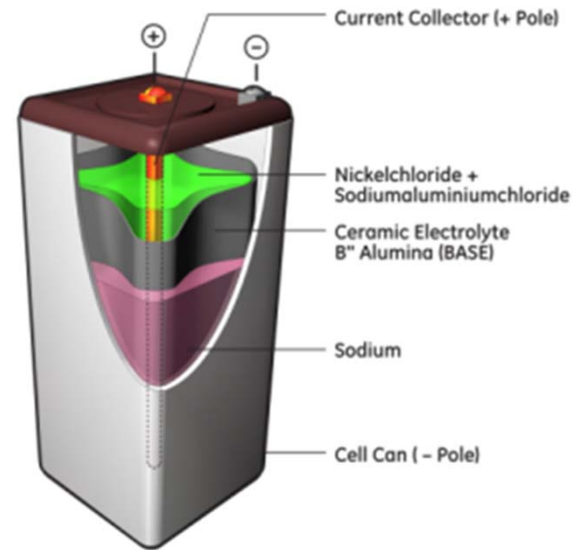


Distribution Optimization

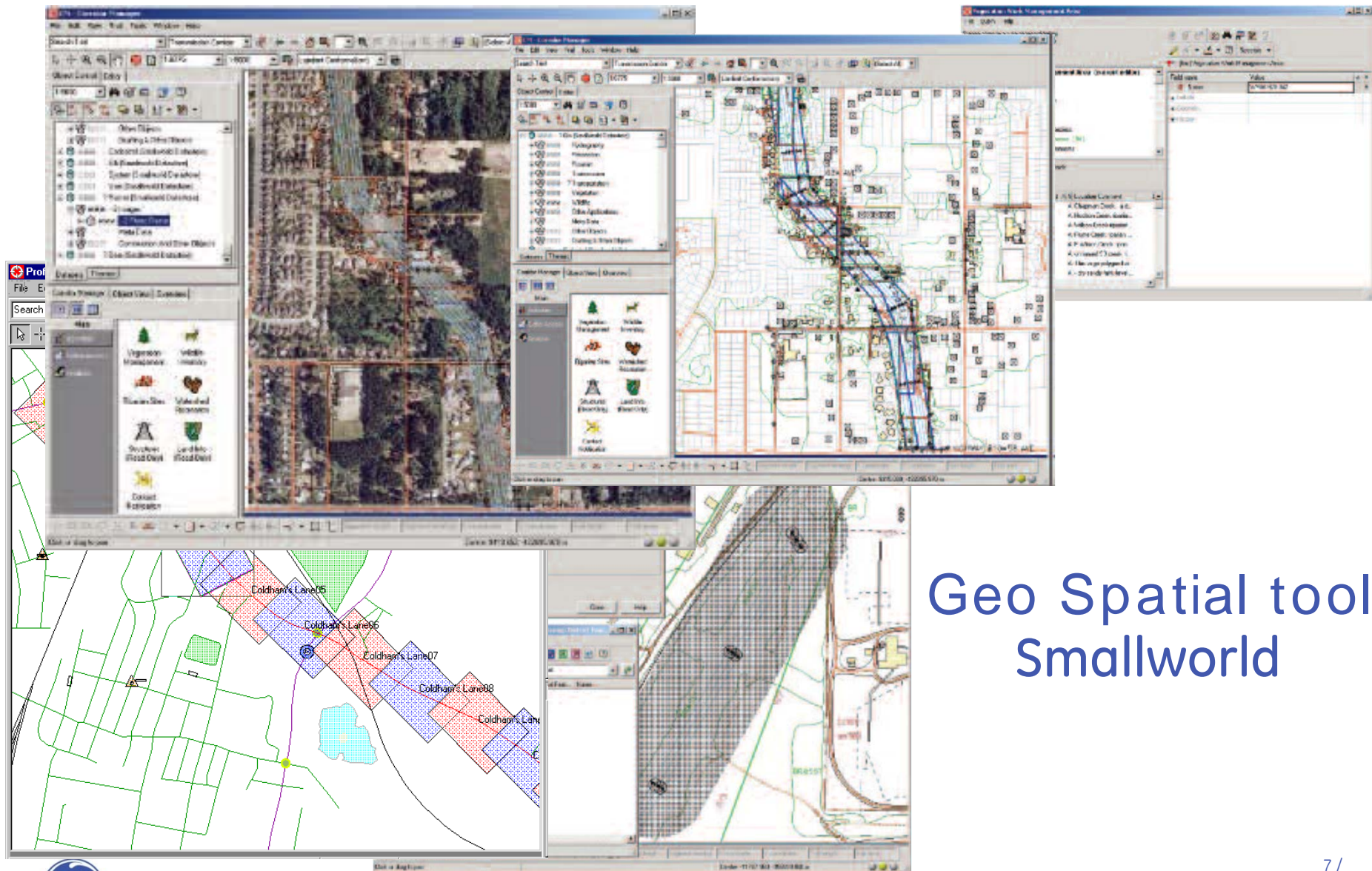


Energy storage by
Durathon battery
 NaNiCl

50kW - 6MW
1 - 8 hrs



Human Resource Optimization



Geo Spatial tool
Smallworld

Demand Optimization

Economic
competitiveness

Energy
security

Empowerment-
Consumer

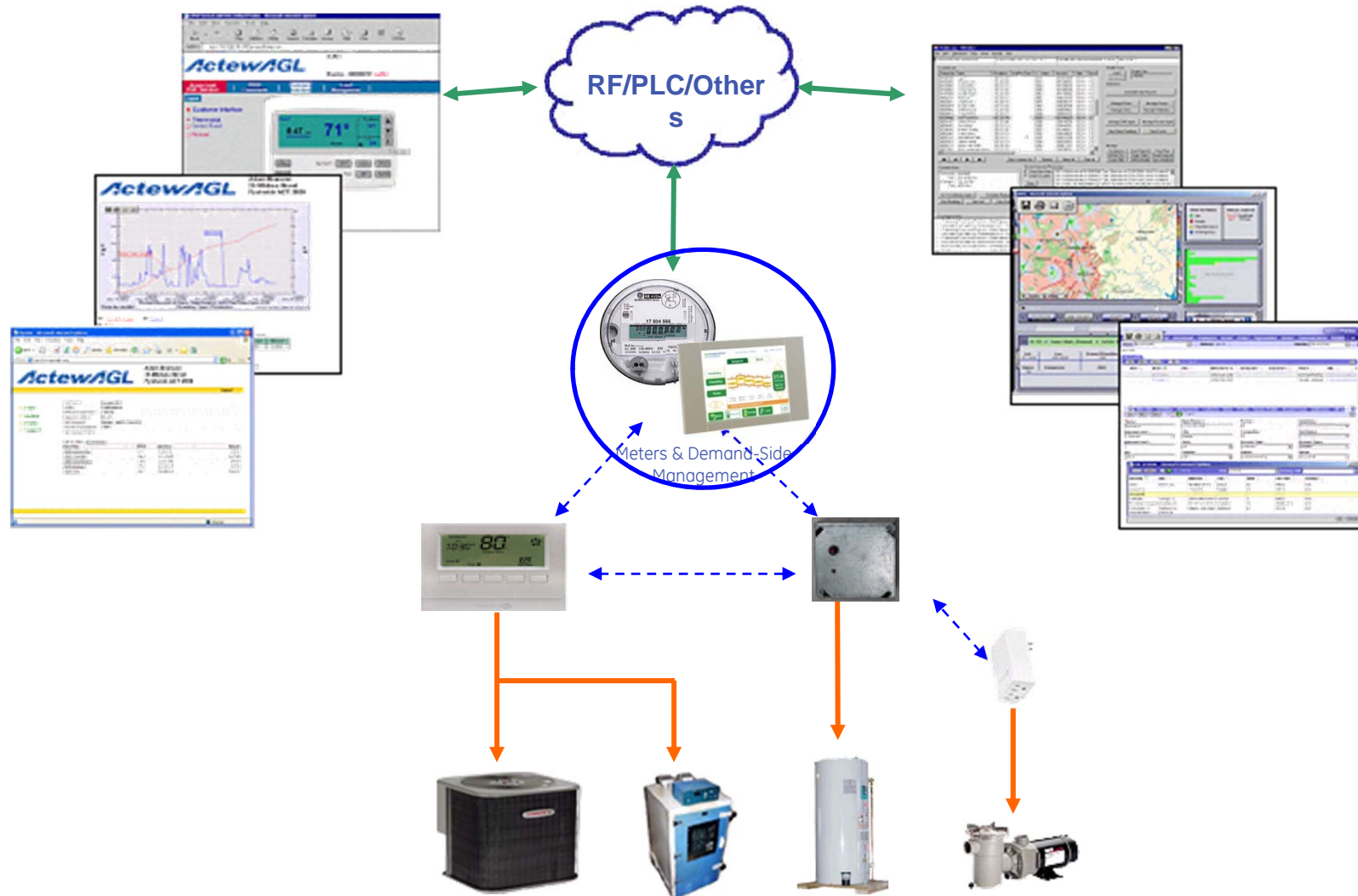
Environmental
sustainability



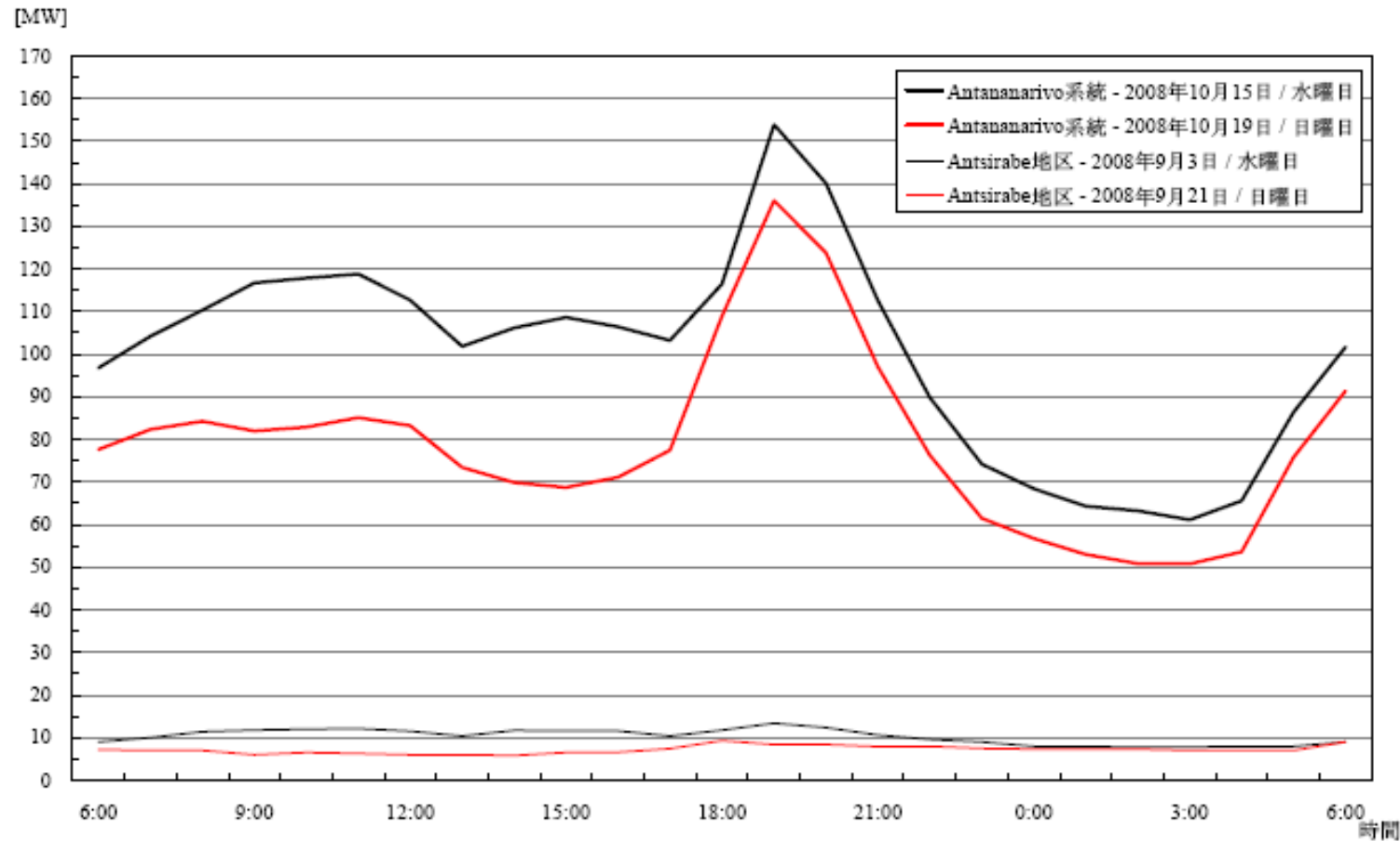
4 "E's"



Demand Response



Demand Shape in Africa



Source: JIRAMA

Behavior Based Segmentation in US

	Savers	First-Costers	Control Cravers	The Privateers	Warm-Bloods	Creatures of Comfort
Description	While initial Installation Cost is important for this segment, this customer is also highly influenced by <u>Net Monthly Savings</u> . Three types: Basic, Comfort, and Convenience Savers.	Initial <u>Installation Cost</u> is the clear driver for this segment. This segment is averse to Changes in Appliance Use, and the Method of Control is a secondary concern.	This customer is primarily concerned about the <u>Method of Control</u> , with Installation Cost and Time of Day of secondary concern.	Besides Installation Cost, this customer is averse to <u>Home Temp Changes of 5°F or more AND Method of Control</u> . Net monthly savings less important.	Besides Installation Cost, this customer is averse to <u>Home Temp Changes of 5°F or more</u> , yet is rather insensitive to Method of Control. Net Monthly Savings much less important.	Regardless of Installation Cost, this customer is most averse to limiting <u>Appliance Use</u> and <u>Home Temperature Changes of 5°F</u> or more to generate savings. Often concerned with Method of Control.
Priorities	1.One-Time Set-Up Costs 2.Net Monthly Savings 3.Appliance Not Used 4.Adjust Home Temp 5.Method of Control	1.One-Time Set-Up Costs 2.Appliance Not Used 3.Method of Control 4.Net Monthly Savings 5.Adjust Home Temp	1.Method of Control 2.One-Time Set-Up Costs 3.Net Monthly Savings 4.Appliance Not Used 5.Adjust Home Temp	1.One-Time Set-Up Costs 2.Method of Control 3.Adjust Home Temp 4.Appliance Not Used 5.Net Monthly Savings	1. One-Time Set-Up Costs 2. Adjust Home Temp 3. Appliance Not Used 4. Net Monthly Savings 5. Method of Control	1.Adjust Home Temp 2.Appliance Not Used 3.Method of Control 4.Net Monthly Savings 5.One-Time Set-Up Costs
Profile	More likely to participate for all potential providers Age < 40 yrs old Employed full-time HH Size 4 or more	Income < \$50K Less likely to participate in conservation activity or adopt technology, esp. Smart Phone	Age > 40 yrs old Race: Less white, more Asian & other Most participative in conservation activity	Age > 55 yrs old Income: Lowest average Race: More likely white Retired, HH Size = 2 Unlikely to participate in conservation activity	Race: More likely white Edu: College degree Retired or Homemaker Home Age < 25 yrs	Age < 55 yrs Income > \$100,000 Home Size >2000 ft ² Edu: Graduate degree HH Size 2 or more Highest % tech. adoption,
VOC	<i>"I would run a washer and dryer at off-peak times. If you could save more by running things at a different time, why not?"</i>	<i>"Appliances, heat and air conditioners consume the most unless you buy [energy saving] appliances... It's expensive to change out all this stuff."</i>	<i>"If the utility ... had a breakout of what I used when and where my major usage is ... that would help...but I don't want them manipulating my energy."</i>	<i>"Empowerment has an ugly twin. The utility company can also manipulate my usage."</i>	<i>"I try to watch [energy usage] but me and my wife have a different idea of what's comfortable."</i>	<i>"It's hard ... it's running your heater or air conditioner if you want to be comfortable... leaving the lights on ... so you don't come home to a dark house."</i>
Value Prop	<i>"A partnership with your utility to slash monthly bills and help save you money, with a low up-front installation cost."</i>	<i>"Our energy management system will enable you to reduce your monthly energy bill by as much as 20% without any up-front cost."</i>	<i>"A premium energy management system that you control to manage your bills, and helps you predict your bill payments."</i>	<i>"An energy management system you program to fit your lifestyle and match your usage needs."</i>	<i>"Our basic home system will find the best times of day and appliances to control, helping you trim energy costs."</i>	<i>"Our premium energy management system helps you command and control your home environment."</i>
Market Size	25%	22%	15%	20%	14%	4%

