

WELCOME



# ALCATEL-LUCENT TRANSFORMING COMMUNICATIONS FOR A SUSTAINABLE PLANET

GILF – November 8, 2011

# ECO-SUSTAINABILITY

## ALCATEL-LUCENT'S APPROACH

Transforming  
communications  
for a sustainable world

- Reducing Our Carbon Footprint

- Developing Eco-Sustainable Networks

- Enabling Low Carbon Solutions

- **GREENTOUCH™** initiative LONG TERM FUNDAMENTAL RESEARCH

# ALCATEL-LUCENT'S CARBON FOOTPRINT OUR COMMITMENT



**Commitment** | Alcatel-Lucent committed to a 50% reduction of its carbon footprint by 2020

# GREEN NETWORKS

## ECONOMIC IMPERATIVES

### SMARTPHONES



**x32**

### INCREASE

In urban areas  
 Today: 400 per km<sup>2</sup>  
 2015: 12,800 per km<sup>2</sup>

### ENERGY COST



**7-20%**

### OPERATORS OPEX

From 7% in mature countries  
 to +20% in emerging countries

### NETWORKS

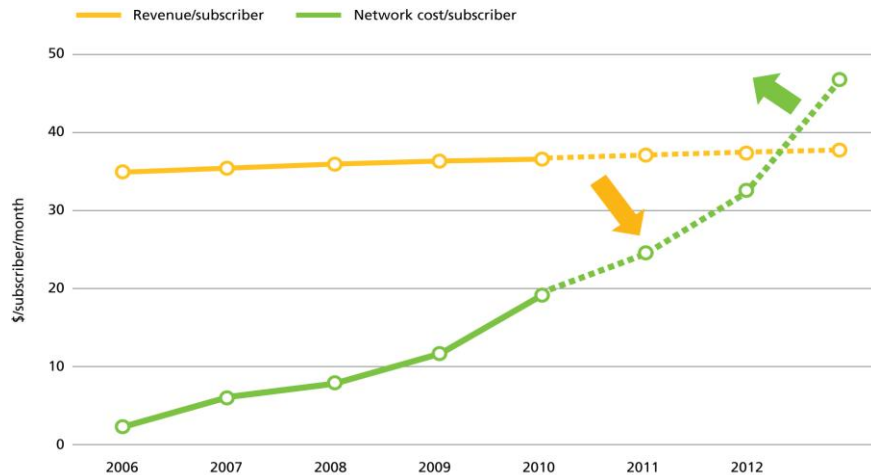


**~75%**

### ENERGY BILL

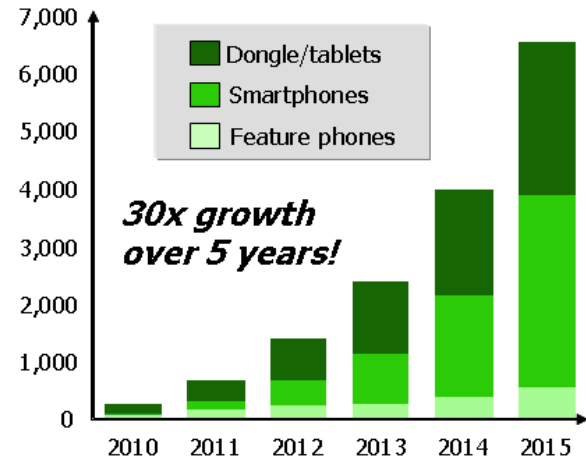
70to80% overall energy bill of an operator  
 > RAN: +70% of network electricity cost

## MOBILE SERVICE PROVIDERS' CHALLENGES



Source: Bell Labs Modeling and Network Planning  
 Conservative traffic model assumptions

### Pbytes/Month

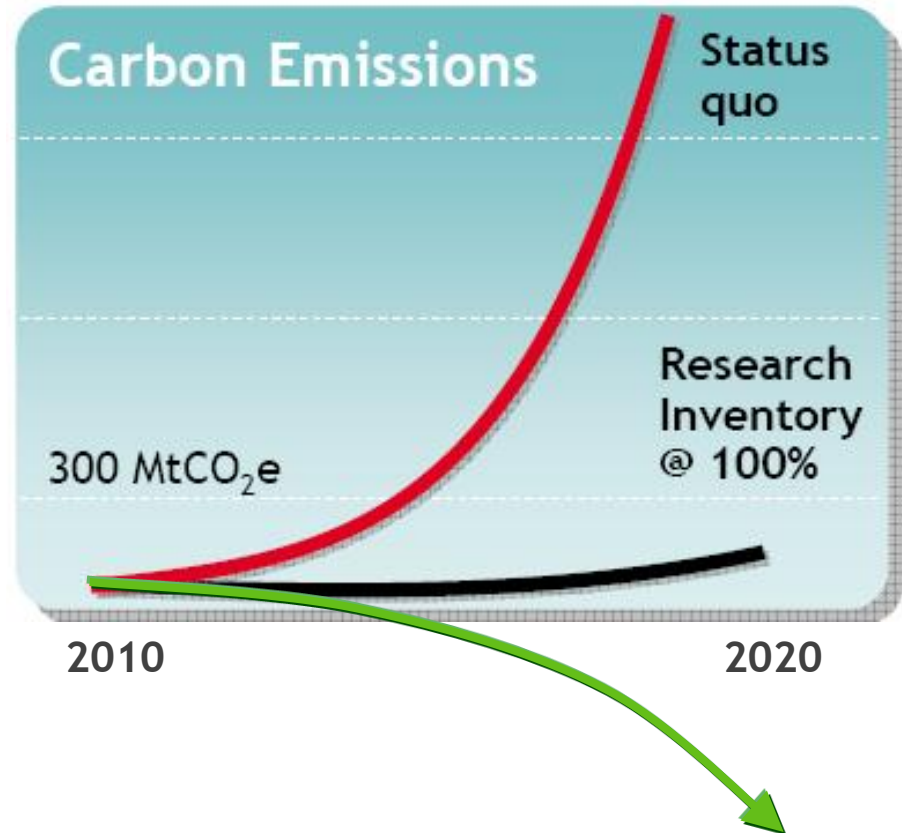


**30x growth over 5 years!**

# WHERE WE ARE

## DOING NOTHING IS NOT AN OPTION

Global Users  
Information  
Vidéo  
Wireless  
HD ... 3D ...



Sustainable Networking

# HIGH LEVERAGE NETWORK™

## NETWORK DESIGN FOR ENERGY EFFICIENCY

SAVE  
**69%**  
POWER

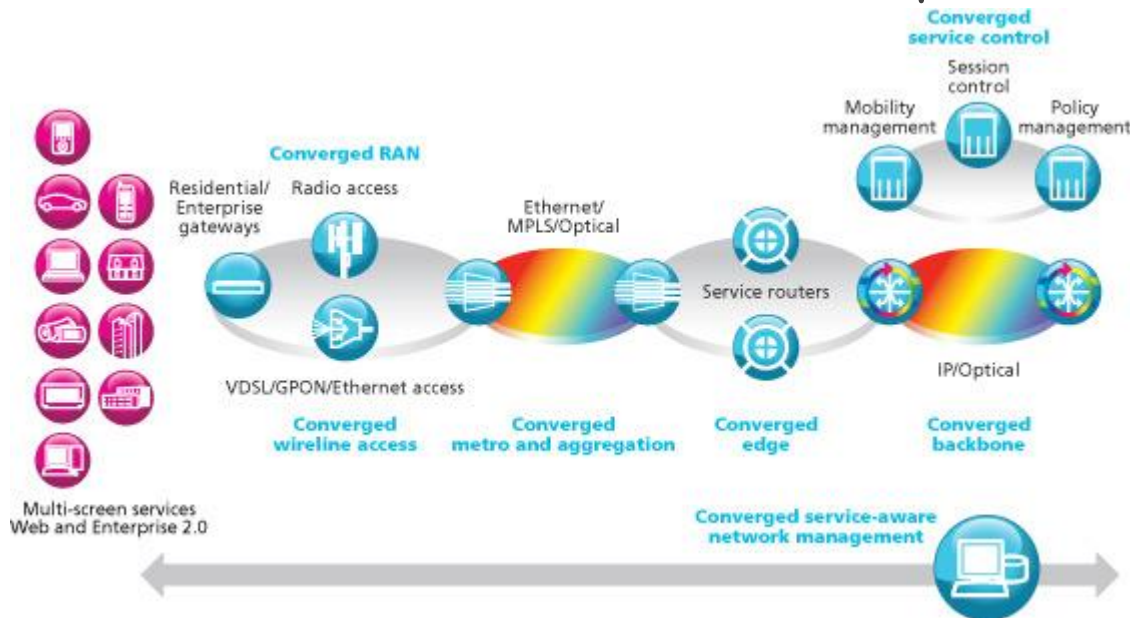
SAVE  
**75%**  
FLOOR SPACE

SAVE  
**1.1M**  
KILOWATT-HOURS



Due to increased **density** and **efficiency** at the **packet transport layer**  
+ Remote OA&M at the optical and IP layers: reduce truck rolls and site visits

Bell Labs study of a typical HLN approach  
566 metric tons of CO2 per year  
1.6 million km in an economy class car



# FP3: 400G NETWORK PROCESSOR

## FASTER, SMARTER, AND GREENER INTERNET

- **4 times** the speed of today's networks
- Improves the **environment**: up to 50 percent less power than equivalent chips in use today



**FP3** | latest silicon design techniques reducing power consumption by 50% or higher for every packet processed



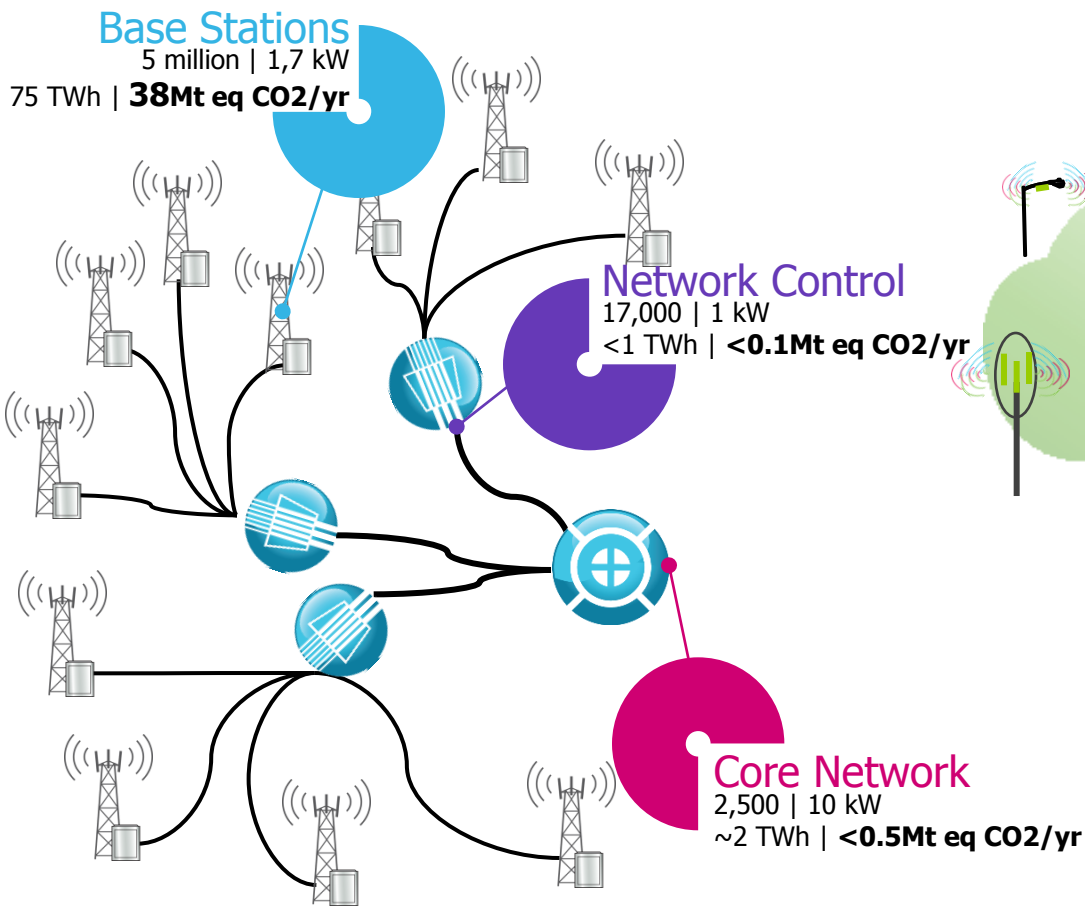
# WIRELESS: NETWORK DESIGN RADICAL CHANGE

## THE ENERGY CONSUMPTION CHALLENGE



TODAY

### ENERGY DISTRIBUTION



TOMORROW

### EFFICIENT NEW TECHNOLOGY & C-RAN

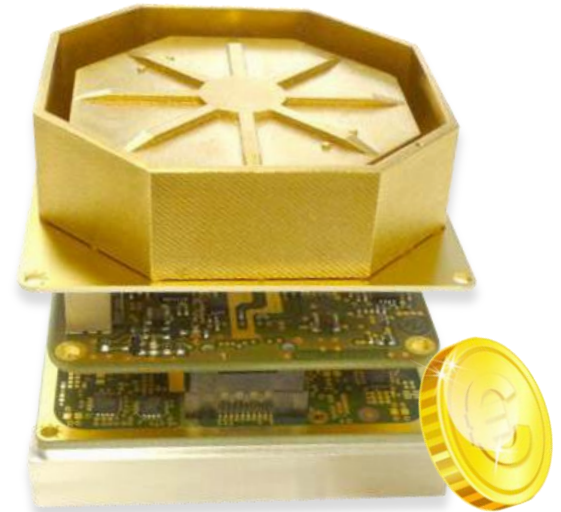


# LIGHTRADIO™

## MAPPING THE FUTURE OF MOBILE TECHNOLOGY

### LIGHTRADIO™

- Improves the **environment**: reduces energy consumption of mobile networks by up to 50%
- Addresses global **digital divide**: easy creation of broadband coverage virtually anywhere there is power (electricity, sun, wind)
- Offers major **savings for operators**: potential reduction of total cost of ownership (TCO) of mobile networks up to 50%



# ALTERNATIVE ENERGY POWERED WIRELESS BASE STATIONS



**Alcatel-Lucent Alternative Energy Program |**  
1st truly industrial solution  
More than 500 base stations deployed to date

# ENABLING A LOW CARBON ECONOMY

## INNOVATIVE COMMUNICATION APPLICATIONS

Enabling Effect:  
Enabling  
a low carbon  
economy

- **Energy** (power utilities): smart grid & smart metering

- **Transportation and logistics:** intelligent transport systems

- **Healthcare:** remote patient care and monitoring

- **Smart communities:** state and local authorities, public safety

- **Cloud services:** virtualization and dematerialization

# GREENTOUCH™

## LONG TERM FUNDAMENTAL RESEARCH



### Bell Labs-initiated GreenTouch™:

- Focus on **sustainability** and growth
- **Holistic** and **ambitious**: Goal of 1000x
- **300 participants** from **50 organizations** and **19 countries**
- **Leading scientists** from across the industry and around the world
- Building on **20 research projects** focused on several key technology areas
- Recognition from the **World Economic Forum**
- Feb 2011: Unveiling the **“Large Scale Antenna System”**, 1st technology demonstration to achieve a 16-fold saving in cellular transmit power
- Leading Green ICT: cooperation with other NGOs such as ITU-T, GeSI, Carbon Trust, ITRS



GreenTouch™ | Demonstrate technologies in five years that lead to a 1000-fold improvement in energy efficiency

AT  
THE  
SPEED  
OF  
IDEAS