ALCATEL-LUCENT: Transforming communications for a sustainable planet (and an iNEMI member perspective)

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GLOBAL REACH
PERCENT OF 2012 REVENUES

49% Americas

26% Europe

7% Other

18% Asia Pacific

Other: Central and South America, Middle East and Africa regions

Executive Briefing Centers
Research Centers
IP Transformation Centers
Product and Solution Development Centers
Bell Labs

AT THE SPEED OF IDEAS™
COMMITMENT TO ECO-SUSTAINABILITY

LEVERAGING BELL LABS AND PLAYING A PROACTIVE ROLE GLOBALLY

DEVELOPING ECO-SUSTAINABLE NETWORKS
- Holistic lifecycle approach (do more with less)
- High Leverage Network™ architecture
- Breakthrough energy efficient solutions (lightRadio™, FP3, XRS)
- Embedding energy efficiency into services offers (optimization, Cloud)

ENABLING LOW CARBON SOLUTIONS
Innovative communications applications in key areas:
- Energy
- Transportation and logistics
- Dematerialization
- Smart communities/cities

REDUCING OUR CARBON FOOTPRINT
- Carbon emissions tracking
- Reinforcing teleworking
- Dematerializing business travel
- Reducing electricity consumption
- Raising employee awareness
NEW USES DRIVE
MASSIVE CHANGES IN TECHNOLOGIES

THE TABLET GENERATION IS IN COMMAND

- 70% MOBILE-ONLY WEB USERS in emerging markets
- 100% Broadband users MICROBLOG (CHINA)
- 90% ENTERPRISES to support corporate apps on personal devices by 2014
- 67% Would cut anything but MOBILE BB (UK)
- 84% CHOOSE INTERNET over partner or car (Germany)
- 66% Sleep with SMART PHONE (USA)
- 500M+ Users per month on FACEBOOK APPS PLATFORM
- 11.5 CONTENT HOURS in 7hrs by 8-18 years old (USA)
- 100M+ TABLETS SOLD in 2012 globally

DRIVING OUR INDUSTRY TO BE MORE FLEXIBLE, AGILE AND RESPONSIVE
AS THE DATA EXPLOSION CONTINUES

SMARTPHONE AND WIDESCREEN ADOPTION
ARE THE KEY DRIVERS FOR DATA TRAFFIC GROWTH

Ubiquitous BROADBAND and MOBILE access

User-friendly DEVICES

Always on, anytime, anywhere connectivity

Creating the perfect storm to force change

BY 2016
25 X
MORE MOBILE DATA TRAFFIC

99%
OF TRAFFIC IN NAR
For 3G/4G connections

27%
OF MOBILE DATA
On Wi-Fi

VIDEO STREAMING TO GROW

89%
(70% OF USERS access mobile video through WiFi)

VIDEO COMMUNICATIONS TO GROW

95%

AUDIO STREAMING TO GROW

73%

VIDEO STREAMING AND COMMUNICATION WILL ACCOUNT FOR 2/3 OF MOBILE DATA TRAFFIC

Source: Traffic Index, 2012 - Bell Labs modeling
ICT IMPACT
THE ENABLING EFFECT

ICT today: about 2% of global emissions

ICT can enable a 16.5% reduction in global GHG emissions by 2020

Source: IEA, BCG analysis for GeSI SMARTer 2020: The Role of ICT in Driving a Sustainable Future

ICT: mandatory path for the development of low carbon economy
WHERE WE ARE: DOING NOTHING IS NOT AN OPTION

THE NETWORK ENERGY GAP

INTERNET TRAFFIC
X 15
2010-2020

INTERNET ENERGY USE
= 5th country

NETWORKS ENERGY USE
+27%
2012 - 2016

GROWING GAP!

Mobile Data
X 186
2010-2020

Internet Backbone
X 12.8
2010-2020

Mobile Efficiency

Wireline Efficiency

Energy Efficiency is a necessity for the ICT industry
DEVELOPING ECO-SUSTAINABLE NETWORKS
HOLISTIC LIFECYCLE APPROACH

Design for Environment
Product Stewardship

Smart Manufacturing

Eco Packaging

Efficient Transport

Alternative Energies

Energy Efficiency

Network Optimization

Take-Back / Recycling / Reuse

Development → Manufacturing → Packaging → Distribution & Installation → Use & Servicing → Recycling

Use & servicing represent 80%-90% of eco impact
DEVELOPING ECO-SUSTAINABLE NETWORKS
NEW APPROACHES FOCUSED ON E2E NETWORK ENERGY

Components and Hardware

Network Architecture

Management and Control

Thermal Management
ENABLING A LOW CARBON ECONOMY
INNOVATIVE COMMUNICATION APPLICATIONS

- 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
Can you address all challenges alone?
“Communication networks could be 10,000 times more energy efficient than they are today.”

— Bell Labs research study
A NEW INNOVATION MODEL FOR SUSTAINABILITY

Bell Labs-initiated GreenTouch™
FOCUS ON ENERGY EFFICIENCY

HOLISTIC AND AMBITIOUS:

GOAL OF 1000X

60 MEMBERS
25 RESEARCH PROJECTS

• 300+ LEADING SCIENTISTS from across the industry and academia around the world
• Recognized by the WORLD ECONOMIC FORUM as industry-led best practice toward sustainability
• Moving from fundamental research into the PRE-COMPETITIVE AREA through standardization
• Leading GREEN ICT: cooperation with other NGOs such as ITU-T, GeSI, Carbon Trust, ITRS

Deliver
architecture, specifications & solutions
+ Demonstrate key technologies
to increase network energy efficiency
by a factor of 1000 compared to 2010
LEVERAGING BROAD INDUSTRY EXPERTISE TO FORECAST AND ACCELERATE IMPROVEMENTS IN THE ELECTRONICS MANUFACTURING INDUSTRY FOR A SUSTAINABLE FUTURE
ADDRESSING KEY ECO-SUSTAINABILITY AND TECHNOLOGY CHALLENGES

- Pb-free Component Warpage Characterization
- Pb-free Rework Reliability Characterization
- Pb-free BGA in SnPb Process Assembly
- Pb-free Early Failures
- Pb-free Component & Board Finish Reliability
- PCBA Reliability Qualification
ADDRESSING KEY ECO-SUSTAINABILITY AND TECHNOLOGY CHALLENGES

Eco-Impact of PVC Alternatives

LCA Estimator

Creep Corrosion

Rare Earth Metals

Tin Whisker Susceptibility

Characterization of Pb-free Alloy Alternatives
ECO-SUSTAINABILITY
ACHIEVEMENTS & COMMITMENTS

KEY ACHIEVEMENTS
+20% INCREASE IN ENERGY EFFICIENCY OF KEY PRODUCTS
-22% DECREASE IN CARBON FOOTPRINT VS 2008

Eco-innovations
• LIGHTRADIO™: reduce energy consumption of mobile networks by 50%
• FP3 PROCESSOR: 50% less power
• 7950 EXTENSIBLE ROUTING SYSTEM (XRS): 66% less power to reduce the eco impact of IP networks

Bell Labs
GreenTouch™, making networks 1,000 times more energy efficient

x2 RESEARCHERS  x5 UNIVERSITY COLLABORATIONS  30% RESEARCH PROJECTS WITH ENERGY BENEFITS

PERFORMANCE TARGETS
+25% INCREASE IN ENERGY EFFICIENCY OF KEY PRODUCTS BY 2012
-50% DECREASE IN CARBON FOOTPRINT BY 2020

Eco-innovations
+75% INCREASE IN ENERGY EFFICIENCY FOR LIGHTRADIO™ BY 2015

COMMON METHODOLOGY for measuring the carbon footprint of network telecommunications products over their lifecycle by the end 2012

The Greenhouse Gas Protocol Initiative
The foundation for sound and sustainable climate strategies
OUR COMMITMENT TO SUSTAINABILITY
ICT FOR GREEN GROWTH

NEED A NEW INNOVATION MODEL FOR ICT SUSTAINABILITY
Create entirely new models with key stakeholders to look at ICT energy efficiency. Green is an industry necessity.

INFORMATION AND COMMUNICATION TECHNOLOGIES

MEASURE & STANDARDIZE ICT’S ECO IMPACTS
Develop harmonized metrics and measurements and common standards for calculating both ICT’s environmental impacts and the positive contribution it can make to other sectors.

MAKE IT A TOP PUBLIC POLICY PRIORITY
Expanding access to broadband infrastructure and services must be a top public policy priority for countries around the globe. Policy makers need to ensure awareness and support.
CONCLUSIONS

ICT NETWORKS ARE GROWING RAPIDLY
- Scaling networks is becoming more difficult
- Bringing focus to energy efficiency

ICT AND RESEARCH COMMUNITIES ARE ORGANIZING TO ADDRESS CHALLENGES
- Dramatic, holistic change, but over long term evolution
- Cooperative organizations such as GreenTouch and iNEMI guiding (re)evolution

SEVERAL PROMISING RESEARCH DIRECTIONS AND INITIAL RESULTS HAVE BEEN OBTAINED

MORE WORK REMAINS!

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