



eltic-Plus⁺

Smart Connected World



Celtic-Plus Event
27-28 May 2015, Vienna

Celtic-Plus Award winning projects present their results OPERA-Net

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<https://www.celticplus.eu/project-opera-net/>





Project Partners



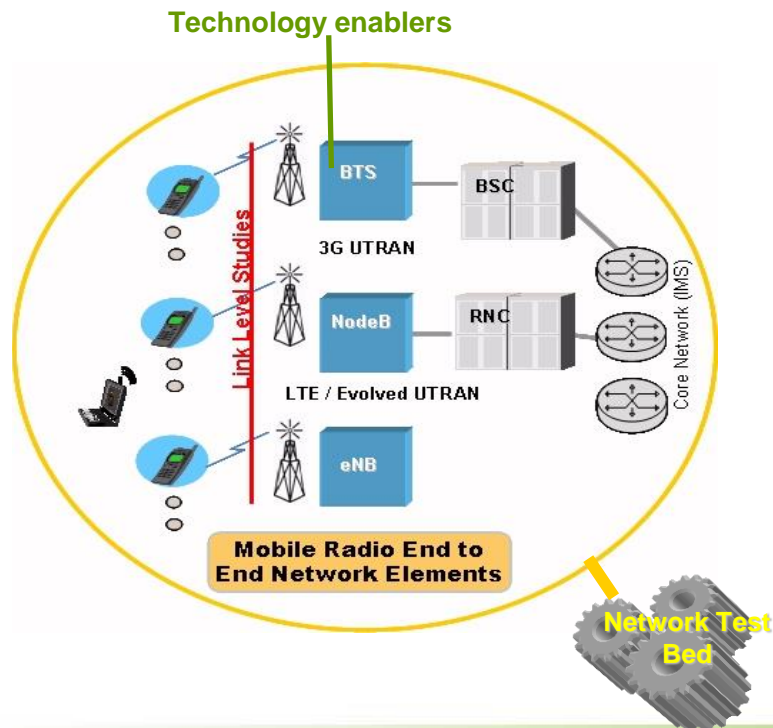
NOKIA



Main ideas

- Definition of Energy Efficiency KPI's
- Base Stations (2G/3G) energy consumption model
- Power Amplifier architecture improvement
- Sleep mode strategies and assessment of energy gain vs QoS

Network Structure :





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Main Outcome

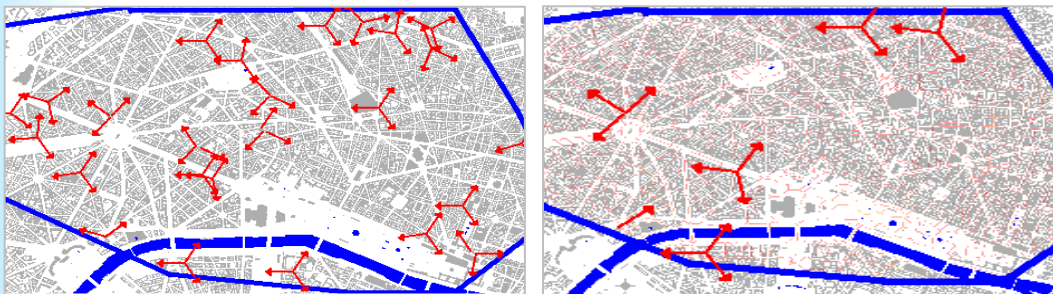
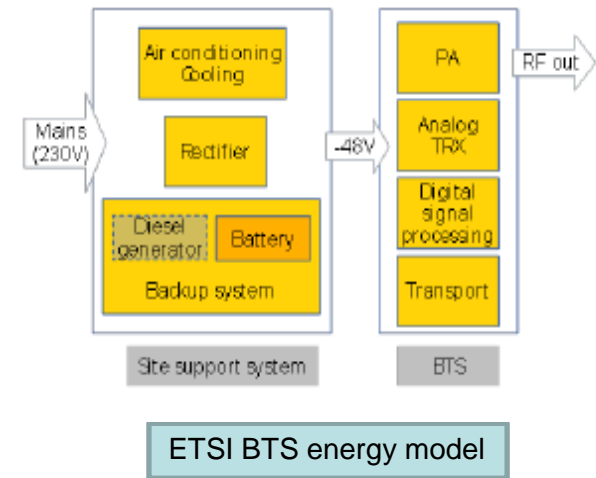


OPERA-Net project has carried out, modelled and measured different sleep-mode strategies.

Those features are now operated by Orange in particular thanks to our OPERA-Net partners :

Alcatel-Lucent, Nokia Networks, Efore, Alpha Technologies.

The main outcome of the project was to prove that “sleep modes” in addition to reduce energy consumption were not impacting negatively the quality of service



Sleep mode simulations identified possible energy savings on current sites

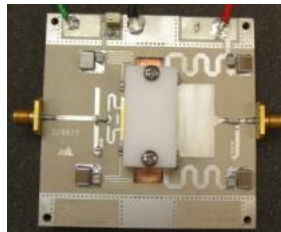
Success Story Business Impact



Arelis-Thomson Broadcast

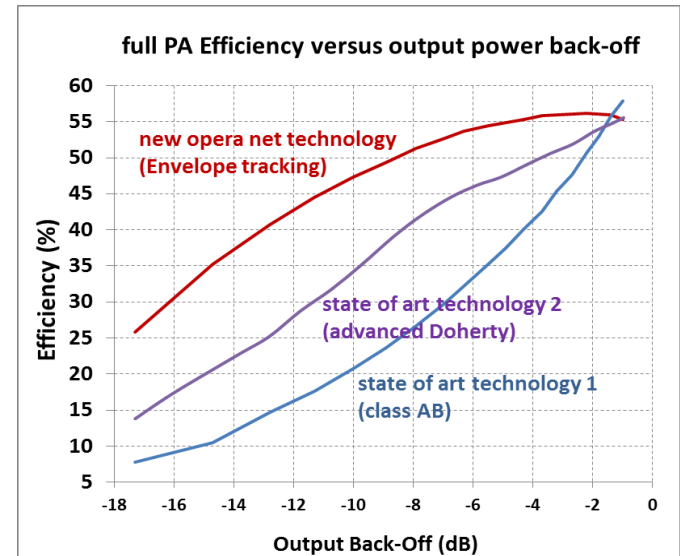
Developed a new set of TV broadcast emitters like Nextivy family launched on the market in September 2014
This product family integrates the new OPERA-Net emitters.

Nextivy Medium-Power Transmitter



Freescale

- Made a significant technological advance concerning the SMPA (Switch Mode Power Amplifier) based on GaN (Gallium Nitrate) technology that typically address the small cells market.
- New products using Doherty and Envelop tracking (AirFast family)



Freescale measurement of a PA pallet

Success Story

Business Impact

Nokia

Opera-Net results are reflected in Nokia sustainability reports

- <http://networks.nokia.com/about-us/sustainability/reporting>
- <http://networks.nokia.com/about-us/sustainability/environment>

EFORE

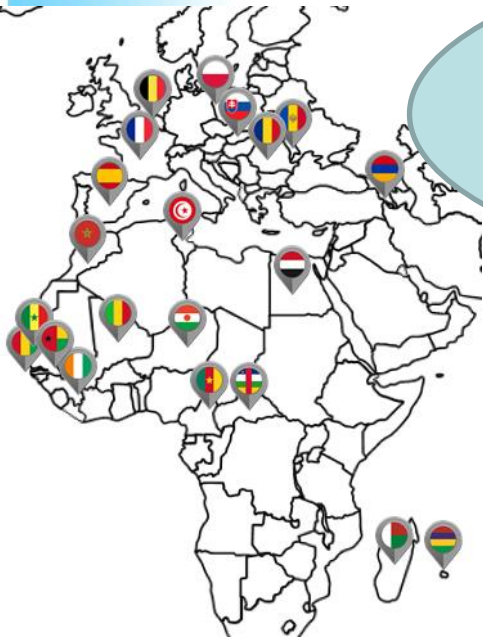
- improved the conversion efficiency of several products
- expanded the AC-input PSU product range.

Alpha Technologies

- 'Compas' monitoring board
- designed and optimized its monitoring units on a real field case

Success Story

Business Impact for Orange



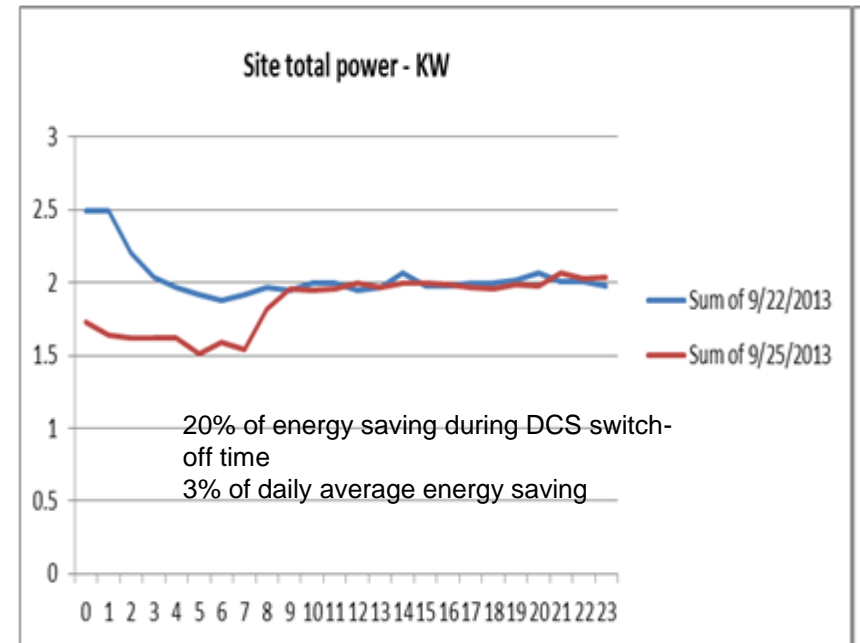
Currently the OPERA-Net ambition (“Optimising Power Efficiency in mobile RAdio Networks”) is being rolled out **across most of the Orange footprint countries in Europe, Africa and Middle East**,
-> representing more than 140 millions of Orange customers considering all RAN suppliers.

Results for EMEA

> 2 % electrical consumption saving of Orange 2G/3G radio sites

Energy reduction in 2013 > 35 GWh

-> OPEX reduction around 5M€ / Year.



Field trial results in Orange Egypt Network



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Return on Investment



Beyond the important gains (both on environmental and economic levels) already achieved within 3 years,

ROI achieved since 2011 : x 12

ROI expected until 2018 : x 35

Number of improved products > 10

Number of patents : 10

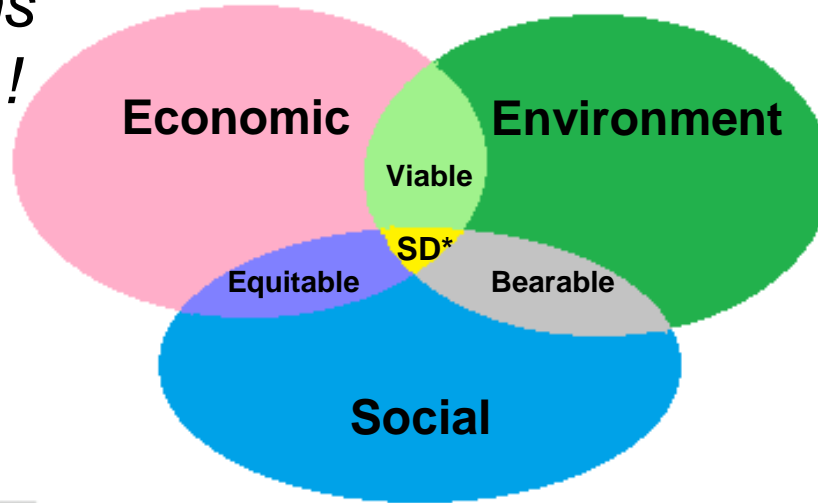
**Contribution to ETSI TS 102 706 :
Energy efficiency of wireless access
network equipment**

the technological breakthrough initiated is still to bear fruit in the next future since the products will be more and more deployed in networks :

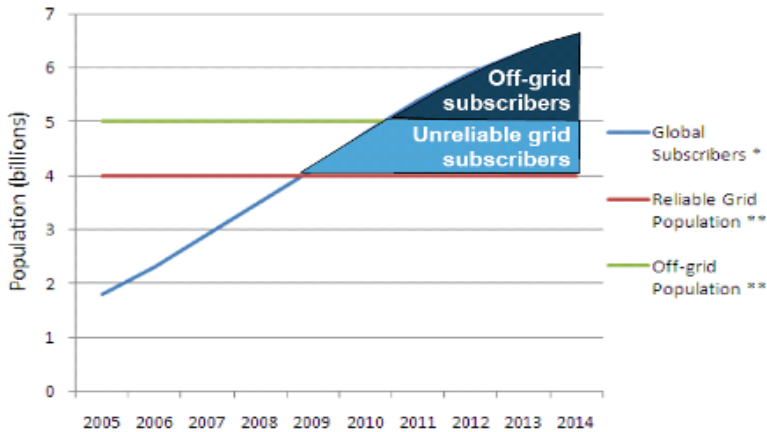
- the deployment of Freescale SMPA (Switch Mode Power Amplifier) based on GaN will increase with small cell deployment

OPERA-Net and now OPERA-NET2

*important gains
on all 3 levels !*



BTS with solar modules



Mobile App : ORANGE RADIO

SD * : Sustainable Development.

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