



# Betsy

**Wireless multimedia streaming on hand-held, mobile or otherwise battery operated devices will be a major technology underlying the next generation information and entertainment appliances. From watching small video clips on your mobile device to playing live games with other people on the bus or looking at the latest news bulletin on your palm while waiting for your plane to arrive, the possible user applications are almost endless.**

Our own home slowly becomes a networked environment, in which devices can talk to each other in either a wireless or wired manner, replacing the old stand-alone devices. But wireless multimedia streaming will also be possible when we are on the move, as so-called hot-spots, places in city centres, bus stations, airports, hospitals etc. come in place. Here our own devices can connect into a local network-

ing area where services and content can be provided, which will give the possibility to retrieve the content we want and have a reasonable amount of bandwidth available.

Today it is not possible, even at design time, to make well-founded system trade-offs between network and terminal resource consumption, energy consumption of the terminal and time-

liness of the streaming data. This makes the quality of audio-video and gaming in the current first prototypes of wireless networked embedded devices by far not comparable to the high quality that people are used to from their traditional TV and audio sets.



## General project overview:

Betsy 

**Project full title:**  
BEing on Time Saves  
energy

**Proposal/Contract no.:**  
IST – 004042

**Project type:** STREP

**Project participants:**  
Philips Research,  
Netherlands  
CSEM, Suisse  
IMEC, Belgium  
Industrial Systems  
Institute, Greece  
Mälardalen University,  
Sweden  
Siemens C-lab, Germany  
Technische Universiteit  
Eindhoven, Netherlands  
University of Cyprus,  
Cyprus

**Contact person:**  
Mrs. Ir. Harmke de Groot  
BETSY project manager  
Philips Research  
Prof. Holstlaan 4, WDC-3  
5656AA Eindhoven  
the Netherlands  
Tel. +31 40 27 44747  
Fax. +31 40 27 44639  
Mailto: Harmke.de.Groot  
@philips.com

**Website:**  
<http://www.extra.research.philips.com/euprojects/betsy/>

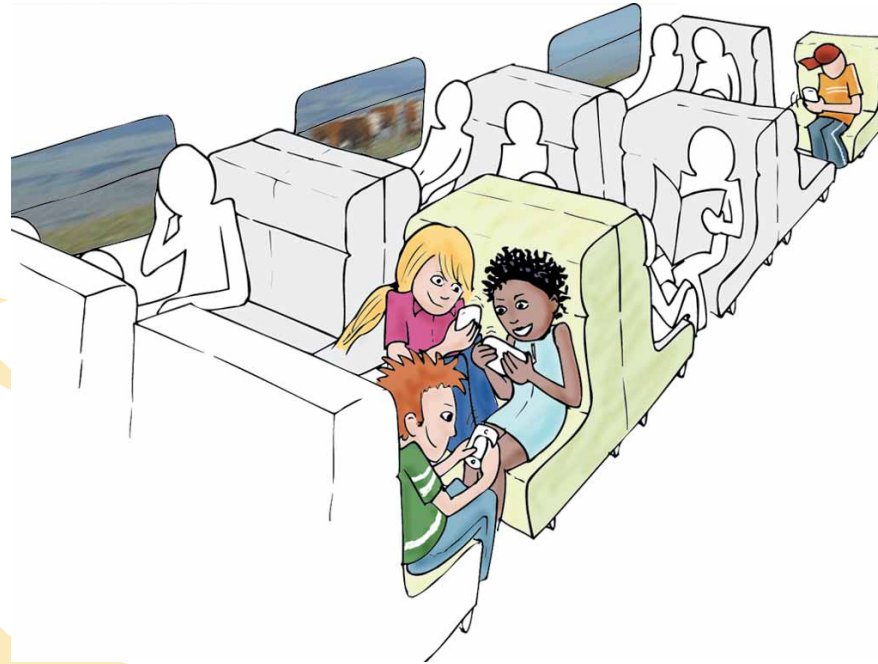
**Budget:**  
total cost: 4.4 MEuro,  
total funding: 2.9 MEuro

**Timetable:**  
Start 01-09-2004, duration  
30 months

### Objectives:

The aim of the BETSY project is to have multimedia streams on wireless hand-held devices seamlessly adapted to fluctuating network conditions and available terminal resources while reducing the energy consumption of the stream processing. This way the user can enjoy true multimedia experiences with freedom of movement in a networked home or at any hot spot.

To achieve this, we need to be able to make trade-offs between the use and consumption of network and terminal resources, such as bandwidth use, CPU consumption, memory needed and power consumption by the terminal, while guaranteeing end-to-end timeliness - required for streaming data. The results of the BETSY project will make this possible.



### Results:

The BETSY project will deliver all the theory, models and design methodology to make well-founded trade-offs between time-constraints, terminal and network resources and energy consumption possible during design time. The project will also deliver a framework implementation that makes dynamic adaptations in this trade-off possible at run-time. To verify the timing and resource model, the framework will be populated by selected components or modules, for example configurable codecs, bandwidth allocation controllers for WLAN cells and display drivers, which use the framework's mechanisms to adapt the processing chain to changes in the resources mentioned above. The framework and its components will be implemented in a streaming server and mobile clients (or equivalent evaluation boards), and evaluated against the scenario definitions and their evaluation criteria. The possible saving of energy consumption in the terminal in a dynamic way compared with traditional methods will be measured as well. The expectation is that the terminal energy savings, depending on the situation, can be in the order of 20%.