

CALL FOR PAPERS

ELMAR-2012 Special Session on Energy Consumption in Radiocommunications Infrastructure

Summary:

Based on International Telecommunication Union estimation, the information and communication technology contributes 2-2.5 per cent into the worldwide greenhouse gas emissions: www.itu.int/themes/climate

This session should present reports on **building energy efficiency** design for base stations (BS). Through field investigation of a typical BS, the basic information on a BS can be achieved, the key factors influencing energy consumption of BS can also be determined and several building energy efficiency designs could be proposed. The effect on the annual cooling load for each energy efficiency design might for example be analyzed and a combined effect for several combinations of the designs by building simulation might be proposed. The building energy efficiency design strategy for BS in Croatia for example could be proposed. It might be found that ventilation design is the primary choice for energy efficiency BS building design. New ventilation cooling technology can be proposed. Based on the field investigations, the application feasibility of ventilation can be studied systematically and the optimization of airflow organization for a BS should be analyzed and proposed.

The focus of this session therefore would also be to study and present efficient and **low power consumption DC power systems** for a central office and base station of telecommunication infrastructure. Telecommunication industry consumes 160 billion kWh each year, and majority of this electrical energy passes through DC power distribution system. Special attention should be paid to requirements for telecom rectifiers and front-end server power supplies - the key functional parts of any data- and telecommunication power system.

The general goal of this session should be to **study a set of solutions** which may allow:

- a) to obtain a rationalization of the consumptions of a base station (BS) through the intervention on energy saving;
- b) to produce, in the sites where the BS are located, energy coming from renewable sources - aiming to reduce the emissions of polluting agents in the atmosphere;
- c) to propose intelligent monitoring systems for the energy consumptions and the relevant impacts on the environment.

It has already been evaluated, from a technical and economical point of view, the feasibility of some solutions, and this session may also cover:

- **energetic auditing** for a radio-telecommunication station in different operational contexts (urban and rural areas, different periods in the year, different working load, etc.);
- interventions of **efficiency** and energy saving such as reduction of transmission apparatus consumptions, optimization of air conditioning consumptions, efficiency in the temperature control system;
- evaluation and development of interventions and technical solutions based on the production of a part of the energy used by radio-telecommunication apparatus, through the **use of photovoltaic cells** on the infrastructures themselves;
- analyses of possible uses of other **renewable sources** (e.g. wind micro turbines) generating energy usable for telecommunication power systems located in areas not reached by the electricity network;
- analyses of the **social and environmental advantages** in the introduction of technologies based on renewable sources for covering a part of the energy requirements of radio-telecommunication installations;
- **simulation studies** useful to estimate the amount of energy that can be saved using a software system that helps to use the BS-GSM transmission power in a more efficient way according to the telecommunication traffic features;
- **environmental monitoring** of the sites where prototypal solutions has been installed, aimed to compare the conditions before and after the intervention.

Special Session Organizer:

Vladimir Roboz, M.Sc.
Authorized Energy Certifier
Senex grad d.o.o.
Address: Goljak 42, HR-10000 Zagreb, Croatia
Phone: + 385 92 217 2435
E-mail: vrobosz@public.carnet.hr