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Contents

Foreword

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Introduction

Energy saving is important for operators for operational efficiency. Energy consumption is a significant operational cost factor for operators. In developing markets up to 30% of OPEX is spent on energy. Energy efficiency is also of concern for our environmental objectives. For Macro base station, base station could account up to 80% of CO2 emission in a mobile network. Smaller cost effective nodes such as FemtoCells and PicoCells are increasingly being deployed. Whilst these nodes require less power budget, they provide smaller coverage area. With increased data rate and more denser networks, need for energy efficiency is expected to increase further and so is the requirement for low energy base station technology. There is an increased focus on identifying opportunities for energy efficiency now then ever.

1 Scope

The present document summarizes the study done under the SI 'Solutions for energy saving within UTRA Node B' defined in [1] by listing technical concepts addressing the objectives of the study item (see below), analysing these technical concepts and selecting the best solution (which might be a combination of technical concepts).

> The objective is to do an initial study to identify potential solutions to enable energy saving within UMTS Node-Bs, and do light initial evaluation of the proposed solutions, with the aim that a subset of them can be taken forward for further investigation as part of a more focused study in 3GPP.
>
> The main objective is to save power of RBS but other savings are also to be investigated. Preference for solutions to be studied can be prioritized as follows.
>
> a) no impact to legacy or new UEs,
>
> b) no impact to legacy but impact to new UEs,
>
> c) impact to both, but minimise impact to legacy.

Solutions that provide energy saving for UMTS NodeB are captured in this Technical report including the ones that do not require specification changes. -Energy saving of site support solutions and NodeB peripheral parts (e.g. rectifier, backup system, Cooling etc) are outside the scope of RAN1 studies.

'Non-backward compatible' techniques are not excluded from discussion at this stage; the impact of the 'non-backward-compatibility' on legacy terminals should be assessed.

The present document provides the base for the following preparation of change requests to the corresponding RAN specifications if any solution are identified as beneficial require specification changes.

2 References

The following documents contain provisions which, through reference in this text, constitute provisions of the present document.

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[2] RP-091439 Study Item 'Solutions for energy saving within UTRA Node B' Vodafone et all…3GPP RAN #46

[2] 3GPP TR 21.905: "Vocabulary for 3GPP Specifications".

[3] 3GPP TS 25.211: "Physical channels and mapping of transport channels onto physical channels (FDD)".

[4] 3GPP TS 25.212: "Multiplexing and channel coding (FDD)".

[5] 3GPP TS 25.213: "Spreading and modulation (FDD)".

[6] 3GPP TS 25.214: " Physical layer procedures (FDD)".

[7] 3GPP TS 25.215: "Physical layer – Measurements (FDD)".

[8] 3GPP TS 25.306: "UE Radio Access Capabilities".