

Energy Efficient Air-Conditioning

Technology Review and Decision Aid for Australian Telecommunications Sites

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Abstract

Energy consumption is a major concern for telecommunications infrastructure companies with issues including government legislation, sharply rising costs of electricity and environmental impacts. Air-conditioning represents a significant proportion of the energy use at telecommunications sites but also provides some of the greatest potential for savings. This paper explores the available technologies and aims to aid engineers in making technology choices that maximise this potential.

The first section provides a technology review covering the major current technologies of today and those presenting significant potential in the future. For each technology the following sections are presented:

- A succinct description of the theory behind the technology with further information available in the appendices if required.
- A literature review discussing the technology's state of commercial development with case study reviews and where available.
- A review and analysis to provide clear examples of how this technology can be utilised on telecommunications sites.
- A list main advantages and disadvantages to summarise the findings and recommend the applications which present the greatest potential.

To aid in the paper's continued use, a decision aid has been developed to give the reader a tool for continual assessment of these ever evolving technologies. The primary aim of the decision aid is to provide a tool that will aid engineers in choosing the most suitable technology by guiding them through an assessment of relevant life cycle criteria. The decision aid is designed for comparison of site specific input data relevant at the time of use and is flexible in its application from high level first pass assessment to more detailed analysis. The decision aid also

has the ability to be applied in a generalised fashion to aid nationwide network planning and focus investment.

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