Utility Management Consulting

MasterPlanning

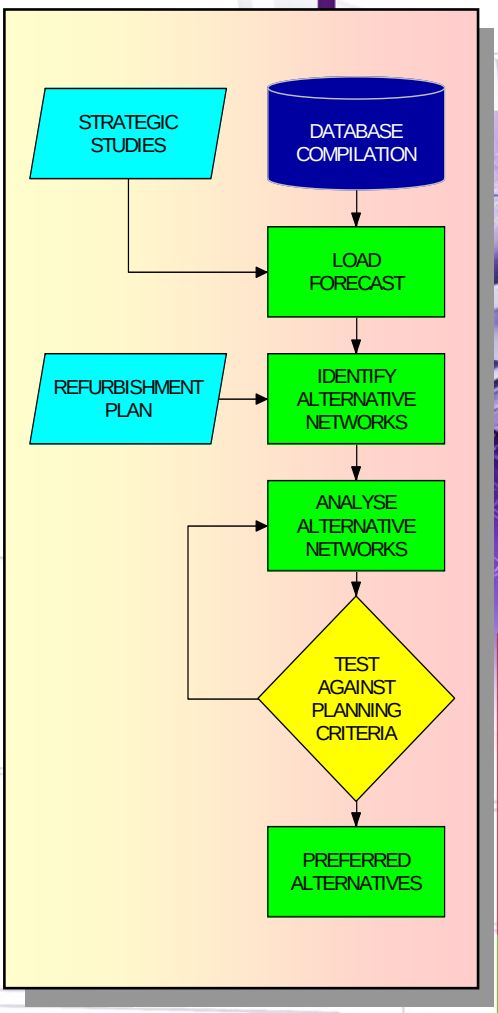
Overview

The basic function of any electric utility is to supply its customers with electrical energy as economically as possible and with a reasonable degree of continuity and quality. Due to a wide range of events that are generally outside the control of the electric power system managers, planners and operators, this becomes an increasingly difficult task. One of the objectives of power system planners is to determine an investment schedule for the construction of electrical infrastructure to ensure the economic and reliable supply to the predicted demand.

Process:

The steps involved in master planning in order to provide electricity capability to a utility supply area include the following:

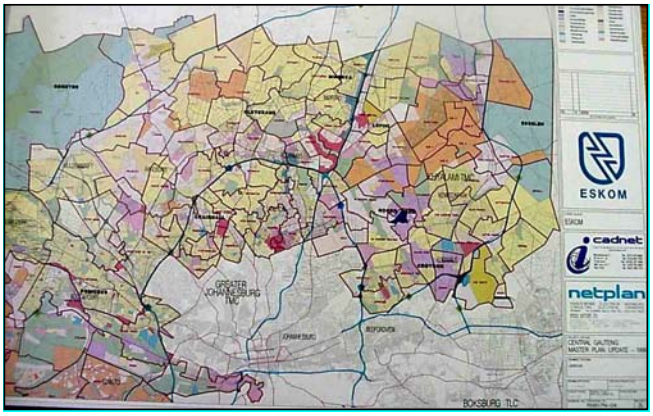
- A load forecast for the entire utility supply area. This result is the foundation of the planning process. The load forecast is preceded by strategic input studies performed by demographers and economists. The load forecast process is computerised due to the large number of computations. The Power GLF product is used here.
- A refurbishment plan, which caters for the renewal of existing facilities when they cannot be cost effectively maintained any longer. The PowerREFURB product is used here.
- Alternative networks are identified and tested that can serve the load and that comply with basic technical requirements under steady state conditions (voltage profile and loading). Fault levels are also evaluated and in special cases stability and reliability constraints are taken into account.
- A 20-year capital program is compiled using PowerCAPEX to cater for network expansion and refurbishment.
- Financial analysis that tests the capital programs for economic viability.



The main outstanding question not resolved is the matter of risk. No network can cater for all contingencies that can possibly occur on the system. The issues are:

- What is the probability that the integrity of the network is jeopardised by a contingency, and
- What is the effect of such an occurrence on the customer loads?

These aspects are addressed by **reliability studies**.



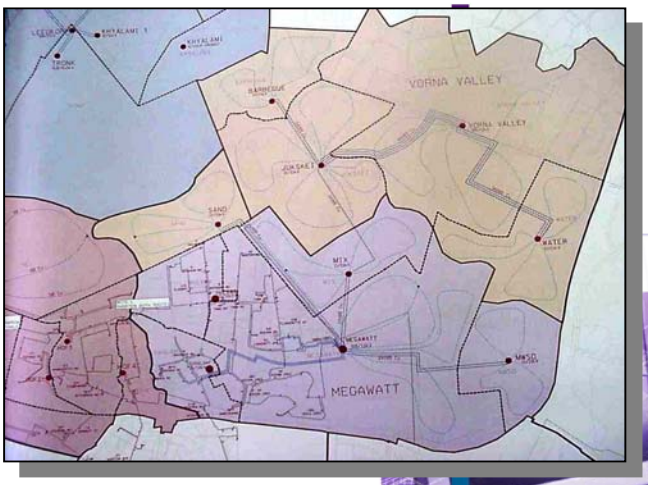
Products Typically Used:

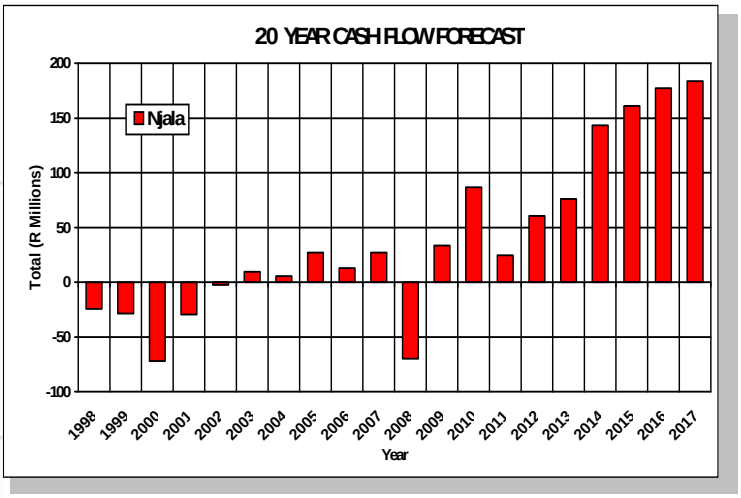
The following products are used in the execution of a typical masterplan:

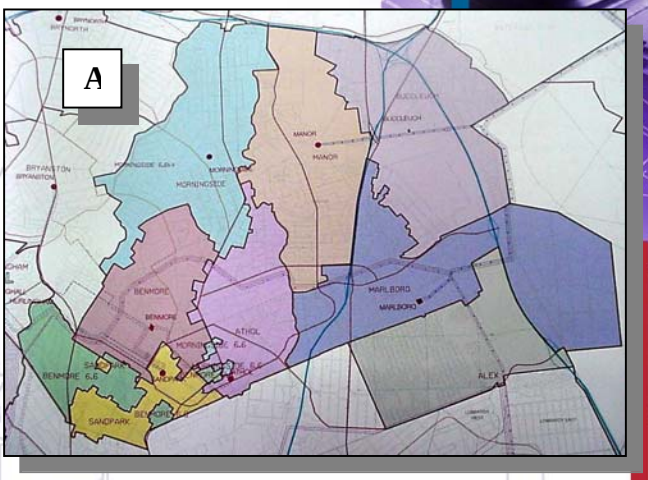
- PowerBASE & Microstation/ArcView
- PowerGLF & ArcView
- PowerREFURB
- PowerFIN
- PowerCAPEX
- PSS/E & PSS/ADEPT

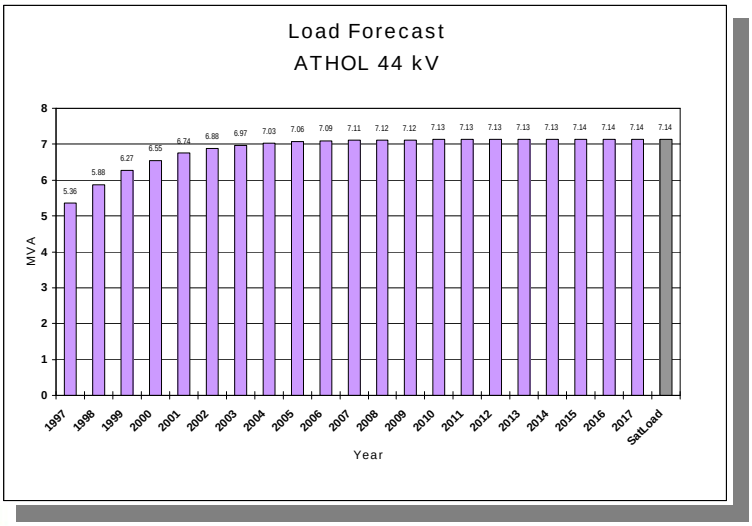
Major Master Plans Completed:

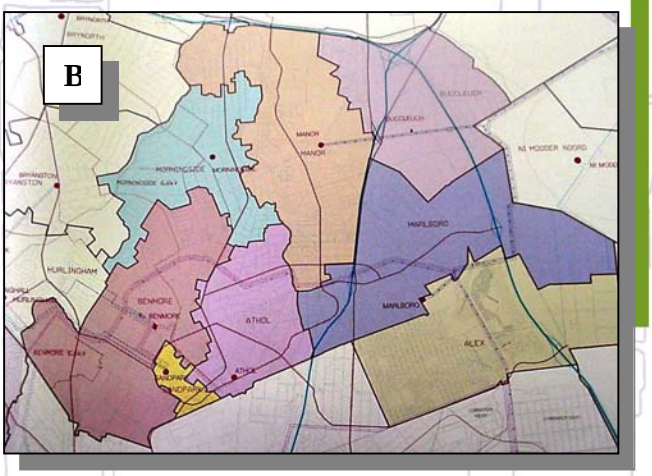
- City Power Johannesburg
- Swaziland Electricity Board
- Tanzanian Electricity Supply Company (TANESCO)
- Eskom Eastern Gauteng
- Eskom West Rand
- City of Tshwane Metropolitan Municipality
- NamPower Rural Electricity Distribution Master Plan
- Nelspruit Town Council
- Transkei (ESKOM)
- Kwa-Zulu Natal (ESKOM)
- TED Rural Master Plan
- Lekoa Vaal Metro Council
- Sandton Masterplan (ESKOM)
- Fourways Masterplan (ESKOM)
- Eskom Eastern Cape











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