CITY OF CAPE TOWN
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CITY OF CAPE TOWN

ENERGY EFFICIENCY REQUIREMENTS

Version: 2014-12-17

Making progress possible. Together.

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Contents

1 General

In view of the current national electricity shortage, measures have been implemented to restrict growth in electricity demand and the use of electrical energy. The following must be noted in this regard:

- The property owner is required to include in the development measures to improve energy efficiency to reduce the consumption of electricity. Applicable requirements will be made available as part of the quotation process.
- Energy efficiency requirements will depend on the authorised capacity applied for. Measures currently required are listed in the following section.
- Owners shall conform to any conservation or rationing programme implemented by a sphere of government or relevant regulating body by reducing their electricity consumption as required in terms of such a programme.

These restrictions may be adapted as restrictions placed on the electricity supply to the City are modified. Applications for a connection to the City's electricity network will be subject to the conditions applicable at the time.

2 Energy Efficiency Requirements

The following energy efficiency measures are currently required for all new or upgraded connections, depending on the authorised capacity applied for.

The latest copy of the document "CTEF100 Load Estimation Standard" referred to in this section can be found at
http://www.capetown.gov.za/en/electricity/Pages/ServiceApplicationForms.aspx

2.1 Up to 60 A 3-phase

- No restrictions; no requirements.

2.2 More than 60 A 3-phase, up to 150 A 3-phase (104 kVA)

- The energy saving measures listed in the Generic Energy Efficiency Measures section shall be considered for implementation.
- A load calculation will be required to show why the capacity applied for is needed.
- The typical minimum load per category can be found in the document "CTEF100 Load Estimation Standard". Capacity requirement in excess of these guidelines will have to be motivated.

2.3 More than 150 A 3-phase (104 kVA), up to 1 MVA

- The energy saving measures listed in the Generic Energy Efficiency Measures section shall be implemented, depending on context and application.
- A load calculation will be required to show why the capacity applied for is needed.
- The typical minimum load per category can be found in the document "CTEF100 Load Estimation Standard". Capacity requirement in excess of these guidelines will have to be motivated.

2.4 More than 1 MVA

- The energy saving measures listed in the Generic Energy Efficiency Measures section shall be implemented, depending on context and application.
- A load calculation will be required to show why the capacity applied for is needed.
- If the required capacity exceeds guidelines included in document "CTEF100 Load Estimation Standard", an Energy Efficiency Compliance Certificate (EECC) shall be submitted to verify that the installation was/will be done in an energy efficient manner. Such an EECC must be issued by an ECSA-registered professional or a Certified Energy Manager accredited by the SA Association for Energy Efficiency.

3 Generic Energy Efficiency Measures

Adapted from Eskom document *Generic Energy Efficiency Specification Sheet - Annexure D - July 2014*

The various energy efficiency requirements described in this section are regarded as the minimum energy efficiency measures necessary to qualify for a new or upgraded electricity supply. While this is not an exhaustive list of best energy efficiency practices, applicants and their professional energy advisors will be expected to enhance levels of energy efficiency and electricity conservation wherever it is practical and prudent to do so.

The requirements listed below are intended as an overall set of guidelines to assist power supply applicants and their energy advisors in producing an Energy Efficiency Compliance Certificate (EECC), where required. Being a general set of requirements, not all the criteria will be applicable to every customer. Customers are therefore expected to select and comply with only those criteria that are reasonably applicable to their specific installation.

3.1 Lighting

- No incandescent or other inefficient lighting technologies may be used.
- In all applications, the most efficient lamp must be used to attain the required levels of illumination.

- Occupation sensors must be utilised where practically possible.
- Automatic lighting control systems with relevant occupancy sensors must be deployed in low traffic building areas such as stairwells, store areas and underground, secure parking areas.
- Unoccupied office space lighting must be switched off at night or the level of illumination must be reduced to conserve electricity.
- Use daylight whenever possible in lieu of artificial light.
- External lighting for pathways, pedestrian areas, etc must deploy renewable solar lighting where practical to do so.
- All relevant new building codes of practice and health and safety legislation must be fully adhered to.

3.2 Electrical Appliances

- All electrical appliances must be SANS-approved.
- Electronic equipment such as computers, computer peripherals and photocopying machines must be switched off at night and during times when not in use, when it is safe and efficient to do so.
- Heavy-duty electrical appliances that require periodic servicing and maintenance, according to manufacturer's instructions, must be covered by an appropriate service contract.

3.3 HVAC

- Employ only high-efficiency HVAC systems and make use of occupancy sensors where practical.
- Make use of high-efficiency HVAC control systems to create an optimum working environment, using minimal energy.
- Ensure new HVAC plant has regular maintenance and service contracts in place, using professional service companies.

3.4 Water Heating

- Employ solar water heating and heat pump technologies only.
- Insulate hot water pipes and hot water storage tanks.
- Use properly functioning thermostatic controls and ensure that they are properly maintained.
- Thermostats must be set at the most efficient level.
- Low flow showerheads must be used.

3.5 High-efficiency Motors

- High-efficiency motors are available up to 90 kW rating and these must be used in all applications of 90 kW or less.

- Variable speed drives (VSDs) should be used in all parts of the process where the output and/or quality of the product will not be compromised.

3.6 Steam Generation

- Steam must not be generated using electricity. Alternative energy sources such as solid fuel, heavy fuel oil and other liquid fuels should be deployed. In exceptional cases, where environmental considerations preclude the use of alternative fuel, electricity may be used but only with the explicit approval of the City of Cape Town.
- Optimum insulation thickness must be used for the boiler and for all steam and condensate pipework.
- Regular boiler service and maintenance contracts must be in place.

3.7 Electrical Infrastructure

- Use appropriate electrical conductor sizes on new installations to reduce distribution losses.
- Optimise plant and large motor power factors to reduce maximum demand and to ensure a power factor of 0,9 lagging or better at all times.
- Exploit off-peak electricity tariffs where they are available where it is practical to do so.
- Deploy automatic electricity control technology where it is prudent and practical to do so. Examples include automatic time control clocks and thermostatic controls.

3.8 Compressed Air

- Employ a compressor load management systems if two or more compressors must be used.
- Design pneumatic systems to minimise losses and wastage.
- Where practical and if alternative, more efficient technologies or tools exist, preference should be given to these over pneumatic applications.

3.9 Buildings

- Insulate walls, ceilings and roofs.
- Increase light reflectance on walls and ceilings.
- Use daylight whenever possible in lieu of artificial light.
- Employ a load management system to interrupt non-essential load when possible.
- Use energy efficient glass or appropriate film, and shade windows from direct sun.
- Design the electrical installation to ensure that non-essential loads are grouped on the same circuits. This will facilitate future remote shedding of

these non-essential circuits by the City of Cape Town, using smart meter technologies.

- Where possible, orientate the building to maximise energy efficiency.

3.10 Lifts and Escalators

- Escalators must switch to crawl or off when not in use.

3.11 Process Efficiency

- Avoid the use of electricity in any thermal process application, unless only possible with an electrical technology.
- Optimise processes to ensure maximum efficiency. Benchmark against best practice.
- Where possible, waste heat must be recovered and used elsewhere in the process.
- Prior to ordering manufacturing equipment, where possible, procure machinery which uses forms of energy other than electricity.

3.12 Cooking and Food Preparation

- Use gas for cooking instead of electric hotplates.
- Deploy electric microwave rather than conventional electric cooking where possible to do so.
- Deploy highly insulated containers for hot water dispensers for beverages.

3.13 Renewable Energy

- Any opportunity to use renewable forms of energy must be used.
- Renewable energy may be used alone or in combination with limited electricity top-up for various end use applications. Examples include solar hot water systems and solar lighting.

3.14 Co-generation

- Co-generation should be considered where possible and where sufficient quantities of waste heat and/or process by-product are available or when superheated steam can be generated and the low pressure steam used for process heating.
- Electricity so generated may be used locally to offset own consumption. Enquire about the latest options and regulations regarding the selling of surplus energy to other parties or Eskom and the wheeling of energy across the networks of the City of Cape Town and Eskom.