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Requirements for installation and use of solar and wind power generation (December 2015)

Introduction

Solar and wind electric power generation for the purposes of providing clean power in the home and potentially for sale to the national power utility is becoming more socially acceptable and popular. It is also appealing to many to satisfy the notion of going “off grid” and becoming power independent. Unfortunately it also requires rather sophisticated equipment, complex circuitry and installation and control if such a system is to be run in conjunction with the normal estate electrical power supply.

First and foremost there is very significant safety issues which must be complied with both in terms of operation but also in terms of equipment utilised. The Occupational Health and Safety Act, 1993 (Act 85 of 1993) covers many aspects of health and safety requirements and responsibilities associated with installation and operation of plant and equipment and would be applicable to any such alternative power generation installation irrespective of whether such installation is at a private home or a factory or on a construction site. In addition the requirements of SANS 10142-1 the wiring of premises Part 1 Low Voltage Installations as well as Relevant Municipal Electricity Supply and other Bylaws will also apply. It should also be noted that Stellenbosch municipality does not currently allow individual power generators to feed power generated into the main electrical grid.

From a home owners association point of view we need not concern ourselves with all of the requirements of the Act or the building standards and by-laws etc. but we must ensure that to the extent required such installations comply with the health and safety regulations as it may affect our members, our employees and employees of service providers to the estate. However the owner installing and operating such an installation will bear the main responsibility for such installation. The discussion and suggested estate rules below therefore in the main attempts to deal with requirements which should ensure that the Home Owners Association complies with its health and safety obligations and responsibilities.

A second important consideration is the aesthetic impact such installations will have on members perception of the appearance of such installations on the estate. This guideline thus also serves to ensure that installations will remain aesthetically acceptable and does not detract from the appearance of homes and the estate in general.

Finally solar power generation technology is evolving at a very fast rate and thus no policy or guideline will remain relevant for too long. Regular review of this guideline is thus mandatory and necessary if the Estate wishes to remain a responsible and flexible contributor to the protection of the environment through the use of green technologies.

Solar and wind Power – Health and safety risks

From the literature and the authors own limited operational experience there are 6 main risks to be considered:



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1. **Noise pollution.** It is known that wind turbines generate a certain amount of noise at frequencies which can be a nuisance and possible hearing damage to people. It is suggested that this type of power generation is prohibited for the time being on the estate. The high winds prevailing on the estate also could give rise to potential turbines over speeding incidents, turbines blowing over etc all of which is a safety risk.
2. **Electrocution of service providers or estate employees.** Incorrect connection to the home wiring system can result in downstream circuits in neighbouring homes being powered up as well creating the possibility of maintenance personnel and or other residents suffering electrical shock when the mains power supply fails.
3. **Damage to mains distribution equipment and neighbouring home appliances.** Incorrect connections can cause voltage spikes and synchronisation problems lethal to equipment and appliances.
4. **Fire hazard.** Under sized equipment and components can lead to overheating, explosion and fire.
5. **Structural Mounting failures.** The mounting of solar panels (Photo voltaic cells) on roofs require special techniques and structural assemblies to ensure that these panels are not blown (Sucked) of the roof.
6. **Poisonous gasses.** Most solar powered systems will include a battery storage system which could generate poisonous and explosive gasses if not properly maintained and ventilated especially if cheap or incorrect batteries are used.

The most important other issues besides safety risks to be considered are:

1. Aesthetical considerations.
2. Noise (Wind turbines).
3. Reflections from solar panels.

Estate rules for installation and operation of alternative (Solar) power generation systems

1. Complete installation designs including wiring diagrams, site plan and weather protection structures must be provided to the Home Owners Association and must be approved by the Board of the Home Owners Association prior to installation. The board may apply all remedies available to it in terms of the Articles of Association, the estate rules and the architectural guidelines dealing with building and construction which has taken place without board approval or not in conformance with such approval including the removal of such installation and applying relevant fines as prescribed.
2. In order to ensure that the number of solar panels is kept to a reasonable number thus allowing solar panels to be mounted as far as possible on areas of the roof not so visible to neighbours and passers-by. The maximum allowable installed (name plate) kW per free standing building may in any event not exceed **8kW** which would



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require approximately **40 solar panels** each generating 200W and measuring 1.7m by 1m. Thus separate free standing buildings such as a Jonkmanshuis on a werf may each have a maximum installed capacity of 8kW.

3. Such total power can be connected to only one phase or split between the three phases connected to homes of the estate.
4. Solar Panels shall be mounted flush on sloping roofs in the most unobtrusive northward facing section of the home roof utilising a commercial rack mounting system such as Solarfix by solar world. Installation contractors will be required to provide the HOA Board with a certificate of compliance with the mounting system supplier's installation instructions. The mounting position must be approved by the HOA Board prior to the installation.
5. Installations shall comply with the requirements of SANS 10142-1 and the Stellenbosch municipal by-laws. A certificate of compliance issued by an accredited person in respect of an electrical installation or part of an electrical installation that ensures that the electrical installation complies with SANS 10142, shall be provided to the Home Owners Association prior to operation of the system. A new certificate of compliance shall be lodged with the Association after any and every modification or alteration and in any event whenever the property is sold.
6. Solar panels installed on flat roofs must be suitably screened by a parapet wall such that they are not visible from any point when facing the installation from ground level.
7. Batteries used for storage of power must be installed in well ventilated rooms and not near windows of other member properties to prevent noxious gasses infiltrating such premises.
8. It is a non-negotiable requirement that suitable equipment be installed to prevent back feeding into the Estate electrical system. To this end the member will have to provide the HOA Board with a wiring circuit of the installation and full technical details of the equipment employed to prevent such back feeding to the complete satisfaction of the estate electrical engineer and the HOA Board. For this purpose the HOA reserves the right to have its own engineer and consultants inspect the system prior to approval.
9. A portable fire extinguisher shall be mounted against a wall in close proximity to the battery storage system.
10. Home owner's approval will be conditional upon the HOA officials and the Estate electrical engineer being afforded the opportunity at all reasonable times to inspect the installation in order to verify continued compliance and to inspect maintenance records to provide evidence that maintenance as required by the relevant supplier has been done. Housekeeping must comply with minimum standards of no oil or grease around the installation, no loose cables or connections and all guards and safety enclosures and equipment in place.
11. Any requirements of the property insurers of neighbouring properties as well as those of the estate must also be adhered to