

Energy Audit Report

Green Skips Services Ltd July 2009

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1) Introduction, description of the company business

Green Skips Ltd is a family owned private company, specialized in all sorts of professional waste collection, storage, disposal, recycling and destruction.

This includes also hazardous waste services, the handling of clinical waste, electronics, etc and the required documentation, certification of the waste disposal, for companies, who want to claim their eco- tax refunds.

Green Skips Ltd. operates since 1992, holds all necessary permits, and owns its own site of ca. 8000 sq. mtr. in Maghtab next to the government company Waste Serv.



2) General Building Information and Historical Consumption

Company: Green Skips Services Ltd.

Address: Ramla Rd. Maghtab

Type of building: commercial building.

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Total floor area: ca 8000 sq.mtr.

Number of floors: ground floor only double height,

Floor area per floor: ca, 100 sq. mtr. Offices, extra room on top
Garage open for maintenance of the vehicles

Year built: 1996

Main construction material: limestone

Roof: concrete slabs

Approx. number of occupants: 23

Hours of operation:

Monday to Friday: 7.30 - 16.00

Saturdays: none

Sundays and holidays: none

Rates: commercial /kwh

Energy consumption per year approx: kwh 12.700 in €: 1780.-

Water consumption per year approx: qbmreservoir in €:

Town gas: in €:

Diesel: generator for electricity supply only in €: 8000.-

Other fuels: in €:

total in €: in € 9780.-

3) Building Envelope, findings, recommendations

The Green Skip building in the industrial area of Maghtab is built in 1996, consisting of a ground floor with a small reception, offices, stores for all types of bins and skips, and a double height open garage, where the waste collection vehicles are serviced and repaired. Building material was mainly limestone. The roof is covered with concrete. The management plans to stock up part of the building with another floor in the near future.



Since the supply with electricity in this area is not sufficient and reliable for the operation of all machinery equipment, there is a diesel generator installed, who takes over the main power supply.

The structure is simple, there is no special insulation, windows and doors are of good quality and close well, the glass is thick.



The rooms of the offices are all with partitions and rather small, therefore they can be heated or cooled individually. The A/C s are placed well and served regularly.

However, the garage in open towards north and has no doors at

all, is therefore quite exposed to the weather and probably uncomfortable in winter.



On one side of the grounds are stores for hazardous waste, electronic waste etc. They have to be open to one side for safety reasons.

Open sheds for hazardous waste storage



There is another hangar for vehicles under construction, which has a half round shape.



Considered, that for the operation of the machinery a substantial amount of energy is necessary, we recommend, to plan some additional energy sources on the site. The emissions and costs of the diesel generator can be avoided, the company operations will be independent from the poor electricity supply in this area, which probably will remain for some more years.

If the stores with the hazardous waste could be arranged, that the roofs are free, additional photovoltaic panels can be placed. From the point of energy saving the roundish structure of the hanger is not ideal, a rectangular shape with a proper roof could host additional panels too.



The new roof of the office building and the garage are exposed to the sun all day and can serve well for the placement of photovoltaic panels, Part of the site can be used for wind generators,

A thermal recycling system, fed with shredded wood, can add to nearly full autonomy from the government grit.

4) Lighting, findings and recommendations

As can be seen on the photos, taken in the building, lighting fixtures of the Green Skips building are a mostly common lighting fixtures and not energy saving.



Unfortunately no thoughts had been given to placing the furniture and the lighting in such a way, that no energy is wasted, but the desks are illuminated properly.

Our readings show rather poor light on the working places of the desks. (50-300 lux)

No workplaces had the approx 500 lux, recommended by the EU directives.

With installation of more efficient with the electronic ballast and T5 tubes up to 40 % of energy consumption towards the old lighting fixtures can be saved.

The T8 lamps should either be replaced completely with new T5 luminaries (investment ca 150.-€/ unit) or adapters with integrated ballast, which can be fitted into host T5 tubes and will give the same energy savings, without having hefty installation costs (investment ca 35.-€/ unit)

We found no sensors for the lights, which are connected with movements. (only at the entrance)

Considered, that the working time is always during day light, we recommend sensors mainly in the stores and corridors sensors.

5) Machinery, findings and recommendations

Beside a number of trucks and fork lifters for transport and storage of the waste, the diesel generator and some smaller machines and tools, there is a massive shredder for carton and paper, and granulators for preparation of plastic waste, either for recycling or for export. With an intelligent motor control unit, the electricity consumption can be reduced towards the actual needed power, since the thickness of the material to be handled, varies. This requires an extra specialized survey with a multi-meter for a longer period, which will be connected to the shredder/ granulator to estimate exactly the possible energy savings.

There is a substantial amount of wood as well, which is more, than can be sold as wood spread etc. The management is evaluating currently a thermal waste recycling system, which would be suitable to produce additional energy, urgently needed.



Shredder for carton/paper

6) water consumption, findings recommendations

There is no tap water consumption, as Green Skips gets bouser water currently.

A big reservoir to collect rainwater from the roof tops has just been built, and should be sufficient with a filter for 1st class and 2nd class water for all purposes of the company operations.



7) office equipment, findings recommendations

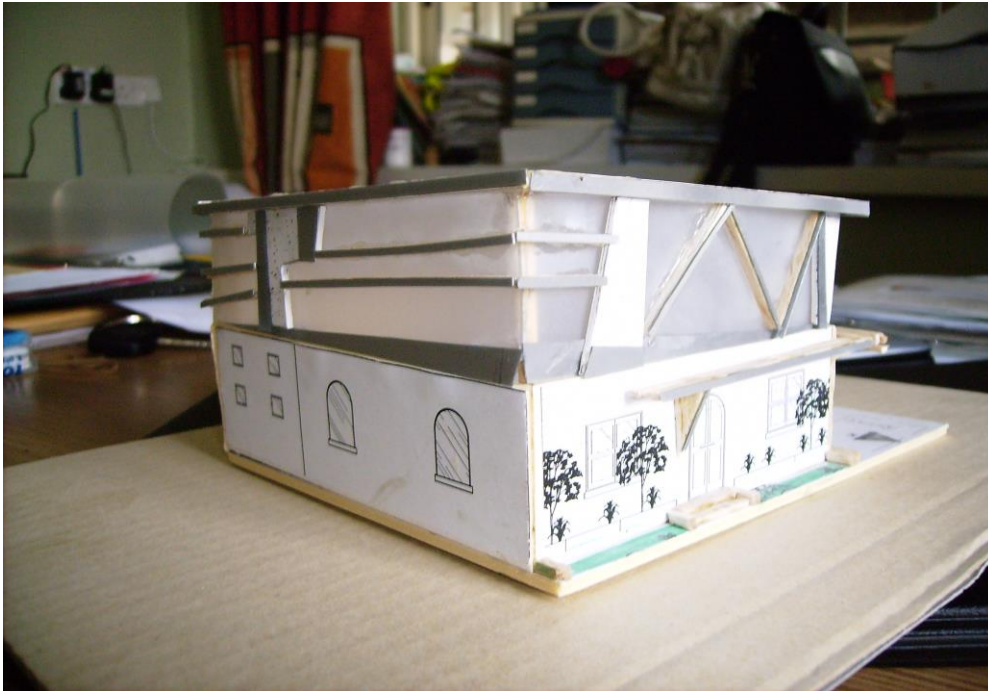
As can be seen on one of the photos , the computer and office equipment of Green Skips is of good quality, even from the point of energy saving, using flat screens instead of the old monitors. On our walk through the premises were no computers found running while the desk was left.

8) summary

This audit had been carried out in July 2009. The last electricity and water bills showing 12 months of consumption were provided, the yearly consumption was calculated on this base and includes the current surcharges. Floor plans and a model of the planned extension were presented too. The architect has considered energy saving issues, such as thick glass, an airflow system, and form of the roof suitable for the collection of rainwater and the installation of photovoltaic solar panels.

In general, if the grounds and buildings could be cleared and properly organized, much more space would be available for energy saving measures. The rooftops of the sheds for hazardous waste and the hangar (if not round) could serve as additional space for solar panels, on the grounds is also space for wind generators. Both is highly recommended, as energy is supplied currently mainly with a diesel generator.

The purchase of a compact thermal recycling unit, which turns waste into additional electricity, is also recommended, as the input can always be provided and supply with reliable electricity is vital for the companies operations.



Annex with additional information

floor plans

statistic with potential savings for the lighting

sample of planned thermal recycling unit

plans for the extension