HOW TO OBTAIN THE BENEFITS OF ENERGY CONSERVATION

FOR YOUR SYNAGOGUE

Reasons for Energy Conservation:

The Commandment of Bal Tashchis (Do Not Waste) does not apply only to food, but also to other natural resources which G-D gave to us.

To Reduce Your Synagogue Expenses for Years to Come

Where This Reduces Consumption of Oil, Conservation Reduces Dependence on Middle Eastern Enemies.

The Less Fuel That is Consumed, the less Air Pollution results. This means less damage to the environment in which we all live, including the air that we and our children breathe.

This copy is sent to you as a service of the Orthodox Union. The Union recommends that your congregation engage in energy conservation, and is pleased to send you this pamphlet. However, it would be outside our scope to endorse any of the measures herein.

This pamphlet is composed primarily of adaptations of various publications. The largest single source of material is *Energy Star Guide for Congregations*, produced by the Center for Energy and Environmental Education, at the University of Northern Iowa, Cedar Falls, IA 50614.

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Observations and Experiences of the Editor and of the Reviewers

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Dr. Aaron From, Manhattan, New York City

David S. Hess, Esq., Baltimore, MD

Mark Jacob, Manhattan, New York City

Saul Levinson, P.E., Manhattan, New York City

Rabbi Aaron I. Reichel, Esq., Kew Gardens, NY

Rabbi Ephraim Sturm, Far Rockaway, NY

The editor of this pamphlet is one member of the Board of the Harry and Jane Fischel Foundation who chose the materials to be used and added some observations and experiences of his own, and donated the time required. It is his personal policy that his name not be printed in publications made possible by the Foundation's funds. A major purpose of this is that, when, as a Foundation Director he urges use of its modest uncommitted resources for such projects, he is free of possible bias from the prospect of favorable personal publicity.

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This pamphlet is intended to furnish typical synagogues with information and advice regarding energy conservation, that will be useful to them. It is not designed to cover the entire subject.

LIGHTING

A Good Beginning is turning off lights when they are not needed. However, that is only a beginning.

Different Lamp Types -- Your synagogue is probably saving money today, because, in the past, it shifted from incandescent to fluorescent lamps. However, in some cases, a calculation will indicate that more could be saved by shifting to more modern "T-8 tubes" and electronic ballasts. Your lighting dealer or your electrician, can, presumably, give you dollar figures for the costs and benefits of the various changes mentioned in this section. There are also "compact fluorescent lamps" that can be screwed into the same sockets as incandescent lamps, replacing them. They are composed of bulbs that are the shape of the letter "U" inverted, and in some cases their appearance may not be suitable.

Retrofit reflectors -- use specially designed mirrors, to enable two lamps to provide as much light as four. They may be worthwhile for you.

You might also check into high-pressure sodium lamps, and high intensity discharge lamps (HID), which are very bright. For the building's exterior there are lamps which automatically go on and off with the amount of light in the street, among others, HIDs, or electric sensors.

Exit Signs must run continuously. Therefore, even if their wattage is small, it would pay to check the costs of compact fluorescents and of LED's (light-emitting-diodes). In addition to the substantially higher energy costs, incandescent bulbs for this purpose usually need to be replaced 2.9 times per

year, and compact fluorescents, only once in about thirteen to fourteen months. But, LED's last for as much as 25 years.

Adjusting Lighting to Task Needs. There are lighting charts that are available from electrical supply dealers and in some public libraries which indicate the amount of light, measured in "lumens", required for various tasks. E.g. the place where the Torah is read, or where the Baal Tefillah reads the service, requires more light than the rest of the room. Similarly, the portion of a room used primarily for prayer that is also utilized for study, requires more light. A "lumen meter" (which can usually be purchased in an electrical supply house) will tell you, with the aid of the chart, where there is too little light and where there is too much light.

Reducing Lighting. In your building there may be areas where greater wattage is used than anyone really wants or needs. This can include corridors. In the case of certain types of computer equipment, excessive lighting may make people uncomfortable.

The following is an example of how, even under circumstances where one might expect considerable objection, lighting reduction was accomplished with only "a whimper".

In a commercial building once managed by your editor, he reduced the lighting, in the passenger elevators, to two-thirds of what it had "always" been. There were 75 tenants, including 22 lawyers or law firms, 25 oriental rug merchants, and people in various other businesses. Exactly one person, a lawyer, complained. He never raised the subject again, not even when his lease came up for renewal and he was fighting against the rent increase which the landlord required. You, too, may find little real resistance when you reduce excessive lighting, especially in places where no reading is done. However, the

synagogue should use as much light as needed to maintain it as an attractive and comfortable place, for people to pray and learn.

Computerization. A computer specialist may computerize your entire lighting, so that it will automatically go on and off at the proper times, allowing for the variations in sunrise and sunset as well as for the special requirements for the Sabbath and Holy Days.

Subsidy. In some areas, the electric utility company may offer a rebate upon the installation of energy saving equipment, e.g. conversion to T-8, changing exit signs, etc. (Among the places where this is not the case is New York City.)

Switching A Fluorescent Light on and off shortens its life. But, the life expectancy of a bulb is a given number of hours of use, so that leaving it burn also shortens the bulb's life. Even more important, electricity usually is the biggest factor in lighting costs, so it is usually best to switch lights off (including fluorescent ones) when they will not be in use for more than a short period.

Various published opinions as to what is the period for which it is more economical to leave fluorescent lights on, have come to the attention of your Editor. One says five minutes, some say 10 minutes, and some say up to 20 minutes. Only one source goes higher than that. A definitive figure would require some research and a calculation which includes the effective local electricity rate, characteristics of the lamp and of the ballast, etc.

Your Editor recommends that -- generally -- if the period during which lighting will not be required is more than ten minutes, the bulb be turned off. However, where electricity rates are low or where replacing bulbs is a "big job," the rule should provide for a longer period -- but there should be a rule, because, as a practical matter, if there is no rule, the period during which light is actually left on unnecessarily would become longer and longer.

When fluorescent bulbs came into widespread use, the design of the equipment was different from what it is today, and electricity rates were also different. Those circumstances gave rise to the belief that the impact on the lamps, and the cost of the initial starting surge, justified leaving lamps on for long periods.

But, turning off incandescent bulbs has only a minimal effect on their lives. Motion Sensors turn the lights on when someone enters a room and, if no motion is detected for a selected period of time, the lights go out. While they can be worthwhile in many situations, special care must be taken regarding them. We are informed that it is a definite violation of the Sabbath or Holy Day to cause light to go on or off even in this manner. Accordingly, motion sensors should only be used where it will be arranged that they do not operate on the Sabbath or Holy Days. Secondly, in an area where fluorescent lights are turned off every few minutes (see preceding subsection "Switching Fluorescent Lights On and Off") a sensor should only be used if it is programmed to leave lights on for a specified minimum period.

HEATING AND COOLING

Adjust the Thermostat When Space is Not Used. In the winter, a setting of not more than 55 degrees when there are no occupants is generally recommended. (Some recommend as little as 45 degrees.) Contrary to what some people believe, turning the heat off each evening and on again each morning, uses less energy than having the building at the same temperature level at all times (except in certain types of electric heat pumps). There are "seven-day programmable thermostats" by which you can set the temperature for an entire week in advance, avoiding a daily chore. But do not overlook extra hours for the Sabbath and Holy Days.

Where some congregants take it upon themselves to "adjust" the temperature, it has been found to be highly advantageous to enclose the thermostat in a cage which can be opened with a key issued to authorized individuals.

Computerization. A computer specialist may computerize your entire heating system, so that it will automatically go on and off at the proper times, allowing for the variations in sunrise and sunset as well as for the special requirements for the Sabbath and Holy Days -- and the outside temperature.

Stopping Energy Leaks. Caulking and weather stripping are inexpensive -- but essential -- ways to cut down on your energy use. E.g. a 1/8 inch crack along the bottom of a four foot door may seem trivial, but is comparable in heat loss, or cooling loss, to a four square inch hole in your wall. Places to seal (in order to save money on heating and cooling) include openings alongside windows, electrical switches and outlets, and wherever electrical, gas or other service lines enter the building. The ventilation system that exhausts heated air in the summer should be checked before the winter so that it does not do the same thing in cold weather. However, some proper ventilation is essential at all times, particularly where many congregate in one place.

Care of Heating and Cooling Plants. Have your heating and cooling units inspected and maintained each year, preferably shortly before the respective seasons. (Automobiles are normally "tuned" periodically and these units need comparable attention.) Change the furnace and air conditioning filters every two months, to keep them running efficiently. Your boiler room should be kept clean. In the boiler room, label all pipes, valves, wires, ducts, switches and breakers -- as this can reduce delays, especially during emergencies.

If You Have Shades, Curtains, Drapes, or Venetian Blinds in any room. In the winter, keep them closed at night to retain heat in the building. Generally, open

them during the day (for light) and to obtain heat from the sun. In the summer, likewise, they should be kept closed at night. When changing any of these items you should recall that light materials facing the sun deflect considerable heat away from the interior. That is why many buildings are white, at least in part, in warm climates. Alternatively, you may find it desirable to install an awning or overhang on the exterior.

If You Do Not Have any of the preceding, you might check what it would cost to buy (good quality) ones and to install them, and what the annual saving from doing so would be.

Glass -- If you have much glass, consider placing a film on same. Glass, alone, transmits heat or cold much more than most materials. A commercial glazier would be a good source of information about such products.

Trees -- Planting shade trees (if you have space and proper soil) alongside portions of your building that have particularly heavy sunlight can save energy. Besides, trees will enhance the external appearance of your synagogue and (unless there already are many of them nearby) improve the physical environment. Where the sunlight is heavy, deciduous trees -- ones with leaves that fall off in the winter -- will lessen the need for cooling in the summer, but will give you some heat from the sun during the winter. On the north side, pine trees will lessen the impact of cold winds and of snow drifts.

Advice regarding planting trees, from a competent source, free of charge, can be obtained from the U.S. Department of Agriculture "cooperative extension" program. In N.Y. State one can locate their office, for your county, in the telephone directory under "Cornell University Cooperative Extension". For New Jersey, look under "Rutgers". For other States phone 202-720-4483 (an office of the Department of Agriculture) for information as to where to call.

In N.Y. State, to buy seedlings at moderate prices, call 518-587-1120, or write to the Department of Conservation, 2369 Route 50, Saratoga Springs, NY 12866.

In New York City (and perhaps elsewhere), in many situations the City will provide a tree and space for it in the sidewalk and plant it. The first step, here, is to call your Community Board (also known as Community Planning Board).

If a Room is Usually Too Warm, in the winter, opening windows or turning radiator valves should only be a very temporary "solution." Have a specialist check what is wrong with the system.

Do You Heat an Entire Building to Take Care of One Room? E.g. for the daily minyan, or for an office. One solution is a heating system designed to serve individual portions of the structure, called zoned heating. But, in an existing installation it may, perhaps, be too costly in proportion to the amount that can be saved. A moderate cost-method is a gas space heater (similar to that used in many one-story commercial buildings) for the space where the warmth is required.

Electric radiant heat does not heat the air, but heats the persons and things that it reaches. It is another possibility in some cases. Electricity is generally too expensive for heating in most parts of the U.S. But, in this method, the heat is felt within a few seconds after it is turned on. So, one is not paying for a warm-up period. Also, the investment in the system is frequently less than in other types of heating, even with strict compliance with applicable laws, which is important as a matter of fire safety and other reasons.

There also are electric wall units that blow hot air to the floor and do quite an efficient job of heating a room. Use of ceiling fans often helps in heating and cooling by greatly improving air circulation.

Entrance Door(s). It is standard practice to have two sets of doors at the entrance to a building so as to protect the interior, and those in it, from a blast of cold air when someone enters or leaves the building.

HOT WATER

Direct Fuel Savings

Turn the hot water heater down to between 110 and 120 degrees Fahrenheit. If it is above 120 degrees it may scald people and would therefore be dangerous.

Install insulation on the entire exterior surface of your hot water boiler (but be sure to leave the smoke or flue pipes bare). It is also recommended that you insulate all other bare pipes containing hot water, unless they are part of a hot water heating system. (However, insulation of the exterior of buildings that are used only part of the 24-hour period, as is the case with most synagogues, is generally uneconomical.)

Repair all leaking faucets and toilets, and do so promptly.

If your synagogue uses hot water for only a small and predictable portion of the day (as most do) you are burning money if your hot water heater is on continuously. The same is true of your heating pumps. If the heater is operated by electricity, an investment in a timer (which is like a "Shabbos clock") is likely to pay for itself quickly.

In some cases, installation of a tankless hot water heater would produce further savings.

REFRIGERATORS

Vacuum or brush off the condenser coils at least twice per year. (These coils are found either on the back or underneath the unit.)

In order to circulate air properly, refrigerators should have one inch of clearance on either side and three inches of clearance in the back.

If you have more than one refrigerator, check whether there is an opportunity to consolidate the contents into one refrigerator and unplug the empty one(s). If you occasionally need more refrigerator space for a function, plug in the extra refrigerator but only at that time.

Some owners enter into a service contract for an annual fee. This may provide an incentive to the contractors to do the best repairs, since return calls would be a loss to them. It also avoids the possibility of bills for unnecessary work or at excessive prices.

Refrigerators vary in their amount of electricity that they use. Therefore, before purchasing one, find out what its annual operating cost will be compared to other refrigerators of the same size. In most cases, the information can be obtained from the "Energy Guide" sticker on the unit -- but a simple arithmetical adjustment may be needed for the particular cost per kilowatt hour in your community.

If you do not need a freezer portion, you may save, in initial cost and in operating cost, by purchasing a refrigerator only.

AN ENERGY AUDIT

The efficiency of your heating plant and machinery should be a major element in an audit. In addition, one should conduct a search -- reminiscent of a thorough Passover *Bedikah* -- for each place where energy is consumed, and for each point where heat or cold exits or enters your building.

Then, a determination is to be made as to whether or not the energy use can be reduced, or eliminated, without undesirable consequences.

Who Can Do an Energy Audit? On an elementary level, anyone can do it, except for the heating plant or the machinery. But for a professional job, specialists are needed. Of course, professional people expect to be appropriately compensated for their time and skill.

Where Can I Find a Professional? If someone with whom you are acquainted has dealt with an energy professional and can recommend him/her, fine. The American Society of Heating Refrigeration and Air Conditioning Engineers (ASHRAE), 1791 Tullie Circle, NE, Atlanta, Georgia 30329 (404) 636-8400, can recommend such specialists. An individual with an impressive background in energy conservation work for religious institutions, who is willing to travel, is Andrew Rudin, M.S., 7217 Oak Avenue, Melrose Park, Pennsylvania 19027 (215) 635-1122. In some areas, public utilities engage in energy conservation work as do some suppliers of oil. (In New York City and Long Island at this writing, late 1999, the public utilities do not do so.)

For buildings in N.Y. State, a portion of the cost of an energy audit may be supplied by the N.Y. State Energy and Research and Development Authority (NYSERDA), 286 Washington Avenue Extension, Albany, NY 12203-6399, (518) 852-1090, ext. 3319, provided that one complies with their requirements. Its assistance is available to synagogues and day schools.

FINANCING MAJOR CONSERVATION IMPROVEMENTS

Many congregations, understandably, are reluctant to borrow. But, energy conservation projects, where the savings will quickly pay back the investment, are different -- because they create a cash flow with which to meet loan repayments.

It is suggested that you try to obtain interest-free loans for such improvements, from your members, their friends, and others in your community.

But, if free loans are not available, and the reduction in costs is substantial in proportion to the investment, try the bank where your institution has a checking account. If your bank says "No," others may say "Yes." Although lending is primarily a business, personal contacts sometimes play a significant role. A person in your synagogue may know an individual with some authority in a lending institution, or may know a party who has a good "relationship" with a bank. It normally costs nothing (except a little time) to sit down with a bank lending officer to explore the situation.

The interest rate may be high. But, if the loan repayments would be covered by the energy savings, then, presumably it would be a good deal -- because, once the borrowing has been liquidated, your synagogue will have the entire annual saving.

"ADVICE AND CONSENT"

In most congregations, energy conservation is not likely to be started, or probably will be abandoned, if a substantial portion of the membership oppose it.

Generally, it is best to consult in advance, even if you are confident that the reply would be favorable. The reason is that resentment, conscious or unconscious, at not having been asked, often results in opposition.

Also, when people have been involved in the decision process, they are more likely to help in financing because they regard themselves as part of the decision.

But, there are situations, where asking questions would raise problems which would not have otherwise arisen.

So, it is necessary to use judgment, based on the natures of the people involved, and the extent to which the consent of rank and file is usually sought in your congregation in other circumstances.

If you can find some other building, known to your members, where money is being saved by energy conservation, you might ask doubting members why their congregation should not enjoy similar benefits.

A strictly kosher Home for the Aged, in a New York City neighborhood which had "changed", had applied for a State loan towards the cost of erecting an additional building. The State sought the opinion of the local Community Board, most of whose members were of the more recently arrived ethnic minority. There was opposition on the Board, on the ground that taxpayers' money should not be used for a facility where only kosher food is served.

The Executive Director of the Home invited several "minority" Board members to the Home for lunch, on the next legal holiday. These guests were soon convinced that kosher food tasted as good as any other food. Then, they were shown the Meat kitchen and the Dairy kitchen, and the precautions taken to keep them separate, and it was pointed out that chaos would result if there were a third kitchen (for non-kosher food) to be used simultaneously with one of the others. Perhaps best of all, they were introduced to a couple, obviously of the same ethnic background as theirs, residents of the Home, who told them how greatly their life had improved as a result of living there and how happy they were. The opposition vanished.

This story, which your editor witnessed, is cited here to demonstrate that, even when faced with such potentially explosive emotions as race and religion, ingenuity and effort -- applied at an early stage -- can result in an victory for good sense.

THE "ENERGY GABBAI"

It is believed to be advantageous that one person be given responsibility for doing the chores involved in accomplishing energy conservation and for seeing to it that it is achieved.

The term "Gabbai" has, over time, been applied in Jewish circles to positions with varying duties. But, it has always been a post of responsibility, for decisions or for work needed by the community. It would be a healthy recognition of the importance of energy conservation if the person in charge of it is given the title of "Gabbai".

Some may feel that the term "Energy Chairperson" (or, in a large synagogue, "Energy Co-Chairpersons") be used, instead.

MISCELLANEOUS

Labels -- One synagogue has gummed labels, printed in attractive colors, placed over the light switch at the door of each room (other than the sanctuary) on which is printed substantially the following:

The last person leaving this room please

1. Close all windows.
2. Shut off the air conditioning or the heat.
3. Clean up.
4. Shut off lights.

Many thanks for helping our congregation save money.

Other congregations may wish to do the same. However, consideration might be given to adding a reminder (to avoid the possibility of forgetfulness) that most of what is on it would not apply on Sabbath and Yom Tov.

Non-Energy Savings. Reducing the dollar costs of units of energy is not saving energy -- but is also obviously important.

In many States, including New York, provision of electricity and gas is no longer a monopoly, so your synagogue can shop for the lowest rate.

Also, synagogues are generally exempt from sales taxes (including those on electricity, gas and fuel oil). But, it is usually essential to apply in order to have the tax exemption. Also, in the case of real estate tax exemption, it is required, in some jurisdictions, that one re-file the appropriate form year after year.

One can avoid some expensive repairs if the building's leaders and gutters are cleaned each year and kept free of leaves, and if the downspout is kept away from the building.

Use of Information Elsewhere. Much of the material herein may be useful in the building where you live, especially if you own your home -- both from the viewpoint of Bal Tashchis and of saving money.

SOURCES OF FURTHER INFORMATION

Interfaith Coalition on Energy produces numerous research reports, and other papers, on various elements of energy cost saving (and on some other building operation topics), useful for synagogues. A list can be obtained free, by writing to ICE, 7217 Oak Avenue, Melrose Park, PA 19027-3222, or telephoning (215) 635-1122, or faxing (215) 635-1903. Most of them cost $5 each. They also publish a bound pamphlet called *Reducing Energy Costs in Religious Buildings, Workbook for Congregation Leaders*. Part of it relates to matters limited to Pennsylvania, but most of it offers hands-on information useful throughout the country. It is priced at $15.

The U.S. Government Printing Office, Washington, D.C. 20402 offers much printed material regarding energy conservation, at modest prices or at no cost. A

postal card to them will bring a list of their publications on the subject. The same may, perhaps, be true of your State government.

U.S. Environmental Protection Administration. A program of theirs, which publishes materials and gives advice in the area of energy conservation, may be reached by dialing (888) STAR YES.

Your Local Utility may provide additional information.

Your Local Public Library may be another source.

Illuminating Society of North America, 120 Wall Street, New York, NY 10005 (212) 248-5000. They are a professional society whose activities include production of much printed material regarding illumination that can be bought by members of the public.

For Buildings in New York State, advice on energy conservation is available from New York State Energy Research and Development Authority (NYSERDA). It also shares costs, in many cases, for energy audits and for technical assistance, and arranges for loans at below-market interest rates for energy-saving improvements. Its services are available for synagogues and day schools. Contact Mark Mayhew at NYSERDA, 286 Washington Avenue Extension, Albany, NY 12203-6399. Call (518) 862-1090, ext. 3319; fax (518) 862-1091; E-mail: msn@nyserda.org.