THE BIG LIST

"Low-cost/No-cost Recommendations for Rural Homes"

Over 200 Low-Cost/No-Cost Electricity-saving Tips and sub-Tips are listed below. Most will pay back right away, while the rest will take no longer than a year. Then…

The Savings Are Free!

Anticipated Savings:
Simple calculations show that if the low-cost/no-cost tips on this list are installed and/or practiced, overall in-house energy use will be reduced by at least 25% (from a baseline case where none of the tips are installed and/or practiced).

The information that follows is not original, but was assembled from a wide range of sources by Tom Potter, Director – Rural Programs at Southwest Energy Efficiency Project (SWEEP).

This draft was revised July 3, 2008. The small amount of duplication is intentional to independently support different categories. Editorial comments refer to a proposed brochure version of the Big List, which is being maintained in outline form during development. We welcome your comments and constructive suggestions by email: tpotter@swenergy.org. Thanks for your help to-date and going forward!

Nominal Home Electricity End-Uses

(*Pie charts on brochure's cover page will be added*)

		ELECTRIC HEAT		GAS HEAT	
		%	Ann$	%	AnnElec$
Space heating	(H)	25	500	5	67
Space cooling	(C)	25	500	37	500
Water heater	(W)	12	250	-	-
Lighting	(L)	8	170	13	170
Dryer	(A)	6	120	9	120
Refrigerator	(A)	6	120	9	120
Electronics	(E)	5	100	7	100
Washer	(A)	0.5	10	1	10
Dishwasher	(A)	0.5	10	1	10
Well pump	(A)	2	40	3	40
Other		10	200	15	200
			2020		1345

FIVE CATEGORIES OF HOUSEHOLD ENERGY END-USE

I. Comfort Conditioning
II. Water Heating
III. Appliances
IV. Lighting
V. Misc. (Pump and Electronics)

Also included here are sections on Implementation and Other Resources

I. Comfort Conditioning:
Improve the value of your largest domestic asset in two ways: (1) Making the home more comfortable and therefore more saleable, and (2) reducing the energy bill (each dollar of annual energy bill reduction increases the appraised value of the home by $20). Also, improving the thermal envelope allows a smaller, more comfortable and less expensive heating or cooling system to be purchased when it's time to replace the current systems.

1. **Comfort conditioning**
    a. **<u>Affecting the Thermal Shell</u>**
        - <u>Walls, floors and ceilings</u>
            - <u>Applies to heating and cooling</u>
                - **TIP 1** – Fill any visible holes and cracks in inner and outer walls, including service entrances for electric, telephone, natural gas or propane, cable, and water.

                - **TIP 2** – Remove and replace old shrunken and cracked caulking and weather-stripping wherever you find it
                    - Don't wait for winter to do this job, if you can help it; the caulking materials will flow and adhere better when the air temperature is warmer. At least try to do it on a day when the sun is warming up the working areas, and the materials are at room temperature.
                    - Use backer rod material when sealing a crack larger than about one-quarter of an inch; this will increase the life of the seal by increasing the area of adhesion and allowing the thinnest part to flex with the weather, rather than crack and split off.
                    - Use expanding foam to fill large gaps (such as plumbing and electrical penetrations under kitchen sinks and behind lighted bathroom cabinets), but be aware that its expansion can actually displace framing members or electrical lines if applied too liberally. Apply it sparingly and complete the job in two passes to avoid structural damage. Places where such large gaps often appear include:

                        - Plumbing penetrations under kitchen and bathroom sink cabinets.
                        - Electrical penetrations behind lighted bathroom cabinets and over ceiling-mounted and recessed light fixtures and fans.

        - Vent penetrations through bath and laundry walls and ceilings.
        - Chimney or furnace flue penetrations (use only approved high-temperature-rated sealants).
        - Around wall- or floor-mounted electrical outlets.

    - **TIP 11** – Install gaskets on switches and outlets on all walls (both interior and exterior) to block infiltration/ex-filtration (directly and through the cavity walls and attic) to the outside [*An illustration will be added*]

    - **TIP 12** – Block leakage through wall and ceiling fixtures, through cavity wall top plates into the attic, and through floor penetrations (to unheated basement, garage or crawlspace), with foam or caulk. [*An illustration will be added*]

    - **TIP 13** – Pay special attention to blocking leakage through light fixtures into dropped soffits in kitchens and bathrooms. [*An illustration will be added*]

    - **TIP 14** – Prepare for your next stage of envelope-related electricity saving by noting the insulation levels in your walls and ceiling (for electric heat at 10 cents/kWh, the R-values should be 21 and 49, respectively) and locating a local energy expert who can tell you how much more energy you can save with further conservation and efficiency measures.

- <u>Cooling only</u>
    - **TIP 15** – Maintain the lightest, most reflective roofing color. White or silver coatings are best.

    - **TIP 16** – Help convective or fan-forced attic ventilation during the summer with plentiful attic vents (high and low) and/or fans.
        - Block the high vents in winter to reduce air movement through the attic
- <u>Heating only</u>
    - **TIP 17** – Paint walls and ceilings of bathrooms with vapor-barrier paint to control moisture transport through the thermal shell.
    - **TIP 18** – Cover bathroom walls with wallpaper that has a reflective background to it; this will re-radiate heat,

improving comfort when wet from the bath or shower and reducing the need for extra heat.

- Openings
  - Windows
    - Applies to heating and cooling
      - **TIP 19** – Caulk outside and inside cracks around window frames.
      - **TIP 20** – Add new or replace worn weather-stripping for movable glass frame surfaces.
      - **TIP 21** – Air-seal non-used windows with caulk, foam and plastic wrap, including those with an air conditioner in them.
      - **TIP 22** – While it is seldom cost-effective to completely replace old windows, save energy dollars with little investment by always replacing broken or cracked glass and missing or loose putty.
      - **TIP 23** – Prepare for your next step in electricity savings by considering which windows you would upgrade to increase comfort and save money.
    - Heating season
      - **TIP 24** – Create insulating air space between the glazing and the room with clear plastic films.
      - **TIP 25** – Keep south-facing, sun-exposed windows clean and clear of drapes or blinds during the day to allow the most solar heat in:
        - Simple outside foil reflectors angled beneath south-facing window frames will increase the amount of heat and light the house collects on winter days.
      - **TIP 27** – Close drapes and blinds at night and on cloudy days to provide extra window insulation.
        - Be sure to size drapes long enough to reach the floor, and weight them sufficiently at the bottom to reduce the natural convection of cold air off the window and into the room.
      - **TIP 29** – Consider tight-fitting, insulating exterior shutters (or simply insulating foam board plugs with suitable exterior facings) for seasonal application to non-view north-facing windows that are covered with drapes and shades throughout the winter.

    - Cooling season
        - **TIP 30** – Use trees, shrubs, or vines to block direct sun from entering east windows in the morning and west windows in the afternoon, to reduce cooling loads.
        - **TIP 31** – Keep most direct sunlight out with simple awnings over east, south and west windows.
        - **TIP 31** – Use the lightest colored, or metallic-reflective, shades, coatings or films to reflect back most of the sunlight that gets past the trees, shrubs and vines, before it can be converted to heat inside the house.
        - **TIP 32** – Maintain insect screening over operable windows so that low-cost natural cooling can take place simply by opening one or more windows.
- Doors
    - Heating season
        - **TIP 33** – Caulk outside and inside cracks around door frames.
        - **TIP 34** - Add new or replace worn weather-stripping on movable joints.
        - **TIP 35** – Place a door sweep and/or "insulated sleeper" at the inside base of outer doors to stop drafts.
            - These can easily be made of a soft or flexible tube filled with a moderately heavy, conforming material.
        - **TIP 37** – Apply insulating foam boards to the exterior surface of entry doors where it would not be unsightly (e.g., doors to the garage, car-port, or other buffer space).
        - **TIP 38** – Prepare for your next step in energy savings by considering which un-insulated doors to replace to improve comfort and security, and to save money.
- Other shell penetrations
    - Applies to heating and cooling season
        - **TIP 39** – Foam into rough plumbing and electrical openings to eliminate air leaks through interior and exterior cavity walls.
        - **TIP 40** – Insulate the attic or crawlspace access cover with insulating foam board, and weatherstrip it against air leaks.
        - **TIP 41** – Caulk or foam unwanted air entrances and escapes:

        - Between different siding materials (e.g., brick to lap siding)
        - Between foundation and siding
        - At chimney and vent flashing
        - Into holes and cracks in basement foundation walls, and at their top, between the concrete and the band joist, if accessible
    - Dampers
        - **TIP 46** – Close fireplace damper tightly between fires (you may need simple weather-stripping or fire-proof packing to avoid continual air loss up the chimney).
        - **TIP 47** – Clean accumulated grime from kitchen and bath vent dampers to assure a snug fit.
        - **TIP 48** – Repair or replace dryer vent damper, if necessary, to reduce entry of air when dryer is not operating.
- Heating season
    - Sealable flaps [*Information on using zip-lock bags for this purpose will be added*]
        - **TIP 49** – Apply these flaps to through-the-wall or through-the-door letter drops
        - **TIP 50** – Seal these flaps nightly over pet doors
    - **TIP 51** – Eliminate air leaks through window-type or through-the-wall air conditioners with seasonal plastic covers and weather-stripping applied outside and inside [*An illustration will be added*]

- Yard
    - Heating season
        - **TIP 52** – Reduce winter wind chill by creating a "dead air" buffer with evergreen plantings to the north, northwest, and west of the house, to keep the prevailing winds from "scrubbing" the heat away.
        - **TIP 53** – After you've drained and removed the garden hose for the winter and rolled it up in the garage, apply insulating faucet covers to each of the outside faucets or sill cocks. [*An illustration will be added]*
    - Cooling season
        - **TIP 54** – Reduce effective summer temperatures with shade plantings (large-leafed, deciduous) particularly in south-eastern and south-western exposures where the

shadow (but not too many of the leaves) can fall on the house in the middle of the day. They will make the house more comfortable, reduce cooling costs once mature, and add to your home's resale value.

- **TIP 55** – Block summer heat gain added to east and west walls, and increase evapo-transpiration cooling around the house, with vines, shrubs, ground cover, and other landscaping features.
    - Properly placed vegetation can also channel airflows toward buildings to improve natural ventilation.

b. <u>Equipment</u>

- <u>Applies to both heating and cooling seasons</u>
    - **TIP 57** – Replace filters on any air-handling system (e.g., central furnace, air conditioner or heat pump) every 30 days during summer or winter (unless it's a long-life filter, then follow manufacturer instructions).
        - A clean filter helps you get the most out of your fan-power, and keeps the air-speed higher for more even distribution of heating or cooling throughout the house. Better comfort and such incremental efficiencies reduce the energy needed to heat or cool your home.
    - **TIP 59** – Increase the home's interior mass a little at a time, if necessary to keep costs down (with added concrete, adobe, masonry, stone and water) to better take economic advantage of daily changes in outside temperature, and to improve comfort
        - A typical home has about 8 tons of wallboard and furnishings accessible to the air; a thermally massive house has 80 tons, and provides much higher levels of comfort summer and winter
        - For example, add an extra layer of drywall when renovating, and fill new interior walls with masonry rubble.
    - **TIP 61** – When you're going to be gone for a weekend or longer, turn the air conditioning thermostat to the "off" position.
    - **TIP 62** – Prepare for your next step in equipment-related energy savings by considering replacing old, inefficient heating or cooling equipment with new, down-sized units, re-calculating the load-serving requirements after installing conservation, efficiency, demand response and renewables measures. The new equipment will provide increased comfort and save energy dollars.

- Heating season
    - **TIP 63** – Ensure an adequate supply of outside air to any combustion equipment, reducing the possible health hazard of back-drafting and the loss of heated air to support combustion (of natural gas or stove/fireplace fuel).
        - This can often be accomplished simply by partially opening an outside window into the space in which the equipment is located; a better long-term solution ducts outside air in, and drops it in the vicinity of the equipment's combustion air draw.
    - **TIP 65** – Seal heating distribution ducts that are accessible with improved mastics and plastic bands (not duct tape, which loses its adhesion over time).
    - **TIP 66** – Turn down the thermostat for as many hours as possible, finding a new level of comfort and savings based on:
        - Increasing the relative humidity indoors to reduce the cooling affect of evaporation from the skin.
            - Avoid venting the moisture from baths and showers to the outside; direct it instead into the rest of the house [*Other information for carrying out this practice will be added*]
            - Maintain a collection of houseplants to evaporate water from the soil and "breathe out" moisture.
            - Divert the electric clothes dryer vent into a heated or buffer area of the house (like a greenhouse area, laundry room or bathroom) during the winter only. Use a low-cost kit for 'bubbling' the exhaust air through a water-filled tub to avoid introducing lint into the house. Don't try this with a gas dryer to avoid combustion products.
        - Removing obstructions (like drapes, chairs, sofas, magazine racks, throw rugs, etc.) in front or on top of warm air supply registers, return registers, or radiators.
        - Keeping clean the air flow surfaces of warm air registers, baseboard heaters, and radiators.
        - Wearing insulating clothing in layers, like sweaters, jackets and flannel shirts that easily can be removed when you're more active, and replaced when you slow down and cool off.
        - Draping blankets, shawls, coverlets and other portable covers over you to keep warm when you're sitting or lying down.

    - Paying special attention to delivering local heat (e.g., with a portable electric heater rather than a whole-house heating system) where people spend the most time. Keep those areas warmer with surrounding drapes to reduce radiant chill and furniture to block cold drafts. Don't risk your health and safety with the use un-vented combustion (e.g., kerosene) heaters.
    - Avoiding planning activities or spending time in the chillier, draftier areas near windows and doors.
- **TIP 77** – Set your heating system temperature down manually at night (or if you're unable to do this consistently, install a programmable thermostat), finding a new level of night-time comfort and saving based on:
    - Anticipating bed-time by an hour or more to allow the house temperature gradually to decline .
    - Using layers of increasingly insulated bed-covers
    - Scheduling a morning temperature increase that provides warmer air temperatures when you arise.
    - Setting standard thermostats back manually, if you're willing to deal with the early-morning chill.
- **TIP 82** – Turn the home thermostat to a lower setting when you're going to be away for a weekend or longer; a setting of 50 degrees will provide large energy savings while helping ensure that exposed pipes don't freeze in a cold snap.
    - Be sure water pipes in outside walls are sufficiently warm and insulated to avoid freezing.
- **TIP 84** – Shut down the other energy systems, too, when you take a trip.
    - Turn the water heater thermostat to "off" or to its minimal position.
    - Turn off plug strip electronics.
    - Turn off each of the individual electronics that may not be on plug strips (e.g., TV, printer, small battery chargers and transformers).
    - Don't just leave lights on 24/7 just to simulate occupancy; rather, save money with simple timers for inside lamps.
- **TIP 89** – Add insulation to heating pipes and ducts running through un-insulated areas or areas that you don't want to heat.
- **TIP 90** – Block the space heating ducts or pipes to un-used, vacant rooms or areas of the house.
- **TIP 91** – Air-seal buffer zones, areas of the house that you allow to cool off, from heated house zones.
- **TIP 92** – Place pots of houseplants in sunny window-sills. Their evapo-transpiration in the sun converts liquid water to water vapor, which then is easily conducted throughout the

house with natural and forced air movement. This movement of the latent heat of evaporation has several affects on human comfort:

- It increases the relative humidity in the house, reducing the chilling effect of evaporation from the skin into dry air, thereby increasing comfort at lower air temperatures.
- It reduces infiltration by reducing the dryness-related shrinking of framing that opens up paths for air leakage.
- When the water vapor condenses on a cold surface, it gives up its heat of condensation, effectively .transferring solar heat from the south side to cold areas of the house.
- Understand the temperature needs of the plant, so that when you insulate the window area at night the plant can handle the cooler area on the window side of the heat barrier, or enjoys the warmer area on the room side of the heat barrier.

- <u>Cooling season</u>
  - **TIP 96** – Turn up the cooling system thermostat in the summer (each degree below 78 on the thermostat increases cooling costs by 8%), finding a new level of comfort and savings based on
    - Wearing fewer items of lighter-weight and lighter-colored clothing.
    - Taking advantage of older methods that worked in this climate for increasing comfort before air conditioning. For example:
      - Screened sleeping porches are still a good idea.
      - Evaporative (or "swamp") coolers are very appropriate for the low-humidity areas in the rural West since they use 25% less energy than refrigerated air conditioning. Look for new units powered by photovoltaics, and others that are "indirect" coolers, with heat exchangers that keep the moist are out of the house.
        - Be aware that maintenance requirements of evaporative coolers may be significant to ensure efficiency and avoid water damage.
      - Ceiling fans have a long and successful history of cooling people by keeping the air moving and allowing skin evaporation to do its magic.
        - Where such air movement (equivalent to four degrees F) allows the achievement of personal comfort, fans are less

expensive to operate than either evaporative or refrigerated cooling systems. Even with air conditioning in use, ceiling fans can raise the equivalent-comfort thermostat set point 4 degrees and reduce energy use by 30%.
        - As with lights, it's necessary to turn off the ceiling fan when leaving a room; many are controlled with wall switches near the door, making this a convenient habit to adopt.
        - Most ceiling fans are reversible, so that you can keep air moving around people during the summer, saving cooling energy, but avoid direct air movement over people in the winter. Instead, reversing the fan so that it blows straight up disrupts the natural stratification in a room, bringing warmer ceiling air down into the occupied zone by way of the cooler walls. This increases overall comfort and saves heating energy.

    - Reducing indoor humidity
        - Vent moisture from all sources (e.g., baths, showers, cooking, and clothes dryers) to the outside as it is generated. Hang clothes outside to dry that become damp from weather or exertion in the summer.
        - Plan to carry out moisture-generating activities only during cooler parts of the day or evening:
            - Washing floors, walls, and windows
            - Dishwashing, manual clothes washing and drying
            - Heating liquids to boiling
            - Cooking inside (use the outdoor grill!)
    - Venting heat and moisture generated from the oven and range to avoid loading the air conditioner.
- **TIP 113** – Reduce refrigerated air conditioning use by using natural ventilation, with fan power boost, if necessary, to achieve comfort.
    - This process works especially well at night when the temperature drops. To take best advantage of cooling breezes, become familiar with your prevailing summer wind direction so you can bring in air through up-wind vents (typically screened windows) on the ground floor, and exhaust it through down-wind vents on an upper

floor. In this way you take advantage of the "chimney effect," in which air becoming more buoyant as it warms.

- Whole house fans can improve on the natural "chimney effect." Just be sure the whole house fan can be thermally isolated during the winter, though, to avoid a major source of air leakage.

- Improve personal hydration levels (drink more water!) to feel cooler.
- Avoid strenuous activity during the day's heat.

- **TIP 118** – Provide shade for the condensing unit (the outside part of a window air-conditioner) without blocking the air flow to it.
  - Keep the bug screen on the outside condensing unit free of dirt, weeds, leaves and drifting seeds (e.g., cottonwood).
- **TIP 120** – Practice night-time cooling temperature set-up, especially if security and allergy concerns can be easily addressed, finding a new level of comfort and savings based on:
  - Natural or fan-assisted whole house ventilation.
  - Lighter bed coverings and night-clothes.

Back To Top

II. WATER HEATER

2. **Water heater**
    a. **TIP 123** – Add an insulating blanket to your electric water heater, leaving the thermostat uncovered. For gas water heaters, follow the instructions on the water heater insulation packaging.
    b. **TIP 124** – Reduce the heat loss from a heated water bed by placing an insulating foam board between it and a slab floor.
        - Also insulate with rigid foam between any waterbed edge and nearby exterior wall, and daily with an insulating bed-cover.
        - Use a water bed mattress pad to maintain comfort while allowing the water temperature to be lower in the winter.
    c. **TIP 127** – Insulate hot water supply pipes running through un-insulated areas.
    d. **TIP 128** – Practice hot water economy when washing, shaving and showering, by turning the water on only as needed.
        - You can add a simple shut-off valve to the shower to stop the flow while lathering.
    e. **TIP 130** – Promptly replace washers in dripping hot-water fixtures.
    f. **TIP 131** – Use only cold water for garbage disposal because it solidifies the grease, cools the motor, and saves energy.
    g. **TIP 132** – Turn down the water heater thermostat as low as can be comfortable for the family, accommodating lower water temperatures and savings by:
        - Avoiding the overlap of large hot water use (showers, baths, clothes washing, and dishwashing).
        - Substituting showers for tub-baths, and sharing whole-body wash-ups.
        - Boosting water temperatures with a separate booster heater in the dishwasher, if needed for sanitation.
        - Installing flow restricting faucet aerators and high-efficiency shower-heads.
    h. **TIP 137** – Turn the water heater thermostat to "stand-by," or to its lowest possible temperature, when you're going to be gone for a week-end or longer.
    i. **TIP 138** – Prepare for your next step in saving water-heating electricity by considering the value of replacing your old, inefficient water heater with a highly-efficient new one with more capacity (to help reduce demand), more insulation and hot water traps.
        - When you install a new electric water heater, place an insulating foam pad between it and a concrete slab floor.
        - Consider how you might simply pre-heat the water heater input stream with solar.

Back To Top

III. APPLIANCES

3. Appliances

a. Refrigerator-freezer

- **TIP 141** – Check the temperatures in both the refrigerator and the freezer with a thermometer. If necessary, re-set the controls to maintain a safe and economical temperature no lower than 37-40 degrees Fahrenheit (F) and 0-5 degrees F, respectively.
- **TIP 142** – Plan ahead so you can defrost frozen items in the refrigerator for food safety; this also helps to cool the refrigerator.
- **TIP 143** – During cold weather, put less-temperature-sensitive food items into a dedicated "cooler" area (e.g., garage, pantry, larder).
- **TIP 144** – Protect flavor and reduce moisture loss that triggers the high-energy defrost cycle by tightly closing all water containers in the refrigerator and freezer, and double- or foil-wrapping items in the freezer.
- **TIP 145** – Avoid refrigerating shelf-stable items like pickles, ketchup, mustard, bread, potatoes, flour, etc. Instead, purchase them right-sized for your family and use them promptly.
- **TIP 146** - Keep the door gaskets clean of dried spills.
- **TIP 147** – Keep the refrigerator full or near-full to maintain more stable temperatures.
- **TIP 148** – Apply the "power saver" switch during dry seasons to disable the gasket heater (only needed to dispel condensation during high humidity, which is rare in much of the Southwest).
- **TIP 149** – For food safety, allow hot items to lose heat (from 210º F to no lower than 140º F) in the kitchen during winter, or outside during other seasons, before adding them to refrigerator or freezer load.
- **TIP 150** – Reduce running time of the refrigerator-freezer by keeping the coils clean Use a long-handled brush or vacuum cleaner crevice tool.
- **TIP 151** – Reduce heat gain to remote freezers by applying foam insulating boards to the outside walls and door of the freezer (but not on the side with evaporator coils).
- **TIP 152** – Turn off and unplug refrigerators that are seldom used or unneeded; they can cost you $10 or more a month on your electric bill. They can cost your utility much more, and add to the need for new power plants, especially if located in an overheating garage, and operating during spikes in summertime grid demand.
- **TIP 153** – Prepare for your next step in saving refrigeration electricity by considering the replacement of your old, inefficient combination refrigerator-freezer with a new one that will serve your family's needs better, and use less energy doing it. Look for an ENERGY STAR label.

b. <u>Stand-alone freezer</u>

- **TIP 154** – Insulate sidewalls and door of remote units with foam insulating boards (but not on the side with evaporator coils).
- **TIP 155** – Check the temperature with an appliance thermometer, and adjust the controls if the temperature is below a safe and economical zero degrees.
- **TIP 156** - Plan food additions carefully to avoid excess run-time during loading, and overloading the cooling capacity needed for safe temperature draw-down.
- **TIP 157** – Label and date food additions clearly so that less time is used finding and removing them later, and rotate your stock so that first-in is first-out.
- **TIP 158** – Turn off and unplug freezers that are seldom used or unneeded; they can cost $10 or more a month in electricity, especially if located in an overheating garage and operating during summertime spikes in grid demand.
- **TIP 159** – Keep the freezer full or nearly full to maintain temperature stability.

c. <u>Dishwasher</u>

- **TIP 160** – Minimize or eliminate the pre-rinse cycle by dry-scraping dishes.
- **TIP 161** – Run full loads, checking the operating manual for tips on loading so that you get good washes with full loads.
- **TIP 162** – Use the proper amount of detergent for each load; too much will require extra rinsing and too little won't do the cleaning job.
- **TIP 163** – Keep the water outlet filter clean of food and broken glass or china.
- **TIP 164** – Operate with the "energy-saving" or "short" cycle when you can, skipping the "dry" cycle if your equipment allows it.
- **TIP 165** – If you're doing the job by hand, wash out of a filled sink or bowl, then rinse dishes all together with a spray onto a dish rack, to save water and water heating energy.
- **TIP 166** – In the summer, run loads on cool evenings or, with a timer, overnight, to avoid the hot part of the day.
- **TIP 167** – Prepare for your next step in saving electricity in dishwashing by considering the upgrade of your dishwasher with a new one that has all the new energy-efficiency features, including the option to wash a half-load. Look for the ENERGY STAR label.

d. <u>Clothes washer</u>

- **TIP 168** – Run full loads, and consult your operating manual for further manufacturer tips for getting the best performance for the least energy cost.
- **TIP 169** – Operate with cold or warm water, if your detergent and soil load allow it. If it drains to an indoor sump, avoid running warm or hot loads during hot summer days.
- **TIP 170** – Use shorter cycles and skip the pre-rinse cycle, if soil loading permits it.
- **TIP 171** – Reduce the need to re-wash by pre-treating stains.
- **TIP 172** – Prepare for the next step in saving electricity in clothes washing by considering a replacement washer that uses less hot water to get the clothes clean. Look for the ENERGY STAR label.
    - New washers also may have a more powerful spin cycle to remove excess water after the rinse; this can save energy in the drying cycle.

e. <u>Clothes dryer</u>

- **TIP 174** – Give clothes a "freshness" break by drying them, weather permitting, on an outside line.
- **TIP 175** – Avoid over-drying clothes ("setting" wrinkles and shortening life) by selecting the run cycle best for the size and type of load.
- **TIP 176** – Dry the same types and weights of clothes together, when possible.
- **TIP 177** – Dry loads consecutively to capture heat in the dryer.
- **TIP 178** – Clean lint filters after each load, reducing the extra energy load of back-pressure.
- **TIP 180** – Periodically check for blockages or kinks in the vent piping; removing them will save energy and lengthen motor life.
- **TIP 181** – Save energy and the wear and tear on clothes by drying them in the winter on inside lines or racks, also beneficially adding humidity to the indoor air.
- **TIP 182** – If vented outdoors in winter, avoid running the dryer on cold winter nights to reduce entry of the coldest make-up air.
- **TIP 183** – Periodically check and clean the gravity closure on outside vent openings. With lint attached to the vanes, they may only partially close between cycles, giving outside air unwanted entry to the house through the vent.

f. <u>Range/Stove/Toaster</u>

- **TIP 184** – When you have an equipment choice in food preparation, use the range rather than the oven, and a small toaster oven rather than the main oven.
- **TIP 185** – When you can, use a pressure cooker or microwave oven rather than a stove element or resistance heating oven.
- **TIP 186** – Keep range surfaces and reflectors clean and shiny to improve the coupling between heating element and food.

- **TIP 187** – Reduce the need for the self-cleaning cycle.
  - Catch spills under drippy baked items (e.g., fruit pies)
  - Wipe up oven spills promptly
- **TIP 190** – Use the right-sized pots/pans for the heating element, and the smallest pan possible for the food to be cooked, and always use lids.
- **TIP 191** – In winter, allow pots of hot water or broth to cool on the stove-top before dumping. In summer, dump pots as soon as cooking is done.
- **TIP 192** – Avoid constant checking on your food; keep the lids on to retain heat in the pot, and keep the oven door closed to retain its heat.
- **TIP 193** – Avoid overcooking meat by using a thermometer that can be read through the oven door.
- **TIP 194** – During the summer, avoid adding heat to the house from cooking by preparing lighter, cold snacks and meals, and cooking more meals on the outdoor grill.
- **TIP 195** – Start the self-cleaning cycle after a cooking cycle, especially on cold days or nights, to use the thermal energy already in the oven.
- **TIP 196** – Use the toaster to make toast rather than a toasting grill or oven.

g. Hair dryer

- **TIP 197** – Towel-dry and air-dry your hair as often as possible to save energy, reduce heat damage to the hair, and to keep yourself cooler in the summer.

Back to Top

IV. LIGHTING -

The most important way to stay comfortable at home in the summer is to minimize heat gain. Remember that every watt consumed in the house for any purpose is turned immediately into heat, so if you've got 16 60W incandescent bulbs burning throughout the house, it's about the same as turning on a 1000W electric heater. Not only does it cause discomfort, but it puts 960W of load onto the cooling system, so you're paying to heat up those bulbs until they glow (incandesce), then paying to remove the heat they produce. Here are some better ideas.

4. **Lighting**
    a. **TIP 198** – Turn off any un-used lights of any type when you leave the room.
    b. **TIP 199** – Keep fixture, bulbs and shades clean and unobstructed.
    c. **TIP 200** – Use table lamps and floor lamps for reading and other tasks, rather than general, overhead lighting.
    d. **TIP 201** – Substitute lower-wattage bulbs in hallways and other low-light areas.
    e. **TIP 202** – Maintain clean and light-colored walls and furnishings to reduce the need for electric lighting.
    f. **TIP 203** – Clean and clear away window obstructions to use daylight for more general lighting needs in the house:
        - Higher levels of daylighting generally improve occupants' mood, satisfaction, and comfort.
    g. **TIP 205** – Replace all the incandescent lights in the house with compact fluorescent lamps (CFLs) for general and task lighting:
        - Purchase "spot" or "flood" CFL replacements for locations that require them.
        - Purchase dimmable CFL replacements for those locations on a dimmer switch.
        - Retain the removed bulbs and be prepared to change some lights back if the CFL performance is not adequate (e.g., color or aesthetics) in some locations.
    h. **TIP 209** – Use daylight and movement sensors rather than timers to turn on or off outside or security lights that take advantage of ambient light levels, which change throughout the year
    i. **TIP 210** – Substitute LED lighting for low background light and night-light needs.
    j. **TIP 211** – Replace incandescent outdoor lights with fluorescent or, preferably, high-intensity discharge (HID) lamps that provide the same or higher levels of light with less energy.
        - Yellow LED lights are also available to which bugs are not attracted.

Back to Top

V. MISCELLANEOUS

5. Miscellaneous, including domestic well pumps and electronics

a. Well pump
- **TIP 213** – Reduce pump run-time by:
  - Finding and stopping system leaks; you can tell they're there if the pump goes on in the absence of intentional water use.
  - Promptly replacing washers in all dripping fixtures.
- **TIP 216** – Reduce overall water use to save both water and energy, in:
  a. Washing, tooth-brushing, shaving, tub-bathing, showering, cooking and drinking.
     - Be aware of how water is used in the house, and don't let faucets run when water isn't needed.
     - Temper water used for washing and bathing by reducing the hot stream rather than increasing the cold stream.
     - Install water-saving faucet aerators and high-efficiency shower heads.
     - Chill water in a refrigerator filter pitcher rather than letting the faucet run until it gets cold;
       - another advantage to using the cold pitcher is saving money on groceries. The water used from the pitcher to re-constitute concentrated juices improves the taste and lengthens the useful life of the juice.
     - Purify water with a filter rather than letting the first couple of gallons run in the morning to avoid leached heavy metals.

b. Toilet flushing
- Minimize flushes depending on waste type and volume.
- Install low-cost gallon-per-flush reducers on older toilets.
- Put non-toilet waste into a waste-basket rather than the toilet.

c. Dishwashing
- Run only when full.
- Avoid pre-rinse by soaking and scraping, with special attention to hardened food.
- Run short cycle for lightly soiled loads.

d. Clothes washing
- Operate with full loads only.
- If a partial load is necessary, be sure to re-set the water level for the smaller load
- Reduce the need to re-wash by pre-treating stains.
- Run the short cycle for lightly soiled loads.

e. Yard

- Fix the leaks in your hoses, connections and irrigation system.
- Save water and make your septic system last longer by composting kitchen waste rather than running it through the garbage disposal
- Evolve your landscaping toward more native varieties that use far less water.
- Save gardening water by increasing your garden's tilth by continually amending garden soil with compost and other vegetable matter.
- Mulch around garden plants to reduce evaporation.
- Set your mower to cut grass at the 3" height so the lawn doesn't need as much water.
- Use drip irrigation rather than sprinklers for watering shrubs and trees.
- Irrigate only before 10AM and after 6PM to reduce evaporation losses.
- Delay irrigation when the wind is high.
- Wash the car from a bucket, not a hose.
- Sweep, don't spray, to clean outside surfaces like porches, concrete aprons, steps, sidewalks and driveways.

f. <u>Recycling "greywater"</u>
   - **TIP 245** – Save and re-use water initially used for boiling (eggs or vegetables, for example) and hand-washing, baths and showers for:
     - household plants or gardens
     - re-routed for toilet flushing
   - Keeping more of the rainwater that falls
     - **TIP 248** – Bring back the old water barrel beneath roof downspouts; give it a childproof (and bug-proof) lid and spout, and use the water for spot watering and to replenish a fish pond (which can itself be a source of nutrient-laden water for garden plants).
     - **TIP 249** – Use simple landforms to direct water from hard surfaces to the base of trees and shrubs.
     - **TIP 250** – Prepare for the next step in saving water-related electricity by looking into the purchase of a high-efficiency (insist on "premium" quality) well pump. It will be more reliable and pay for itself in a short period of time.

g. Electronics

- Battery charger and transformer
  - **TIP 251** – Unplug the charger (for batteries, power tools, cameras, cell phones, lap-tops, etc.) when not in use. If it's warm when not connected to an active load, that transformer is continuously using power.
  - **TIP 252** – Plug the power cords of printers and other computer peripherals into a surge protector strip, and turn that strip "off" when not in use to reduce the parasitic draw of the transformers.
- Cell phone
  - **TIP 253** – Switch the phone to "off" (not "stand-by") at night to avoid trickle losses and save later recharging.
- Television, VCR, stereo, fax machine, copier
  - **TIP 254** – 75% of the power use of these home electronics is generated when the devices are "off." Avoid the power drain of the "instant-on" or fast warm-up features by plugging them into a switched surge controller for convenient shutoff at night or during other extended periods of non-use.
- Computer
  - **TIP 255** – Turn your console or lap-top computer to "off" (not to "hibernate") during long periods of non-use (e.g., every night).
  - **TIP 256** – Where possible, configure all computer peripherals (e.g., printer, scanner, monitor, LAN router) to go to "standby" when not used for 20 minutes. Then turn them all off with a single plug-strip switch when the work period ends.
- **TIP 257** – Prepare for your next step in saving electronics-related electricity by looking into the availability of new electronics models with much higher energy efficiency. Look for the ENERGY STAR label.

Back to Top

IMPLEMENTATION – Lists of measures and practices will not by themselves save energy in a home. Rather, people have to decide that one level or another of this evolving energy-saving behavior makes the most sense for the family, and can be achieved within the lifestyle the family has chosen. Once that way of thinking has been established, the following tips can help make it happen.

Implementation

- **TIP 258** – Instill an appreciation for and commitment to the new energy-saving behavior. For example:
    - Discuss the why's and how's of the proposed action, and the family benefits.
    - Get family members' ideas for how best to carry out the project in your home.
    - Have family members all agree that this is what the family wants to do, at one level or another.
    - Discuss and print a simple consensus paragraph describing the maximum level of energy-saving involvement that can gain universal acceptance in your home, have each family member initial the consensus, and post it centrally.
- **TIP 263** – Help people remember to participate in the proposed action:
    - Suggest that each member remind the others occasionally: e.g., "Remember, we agreed to be on this family energy-saving program together."
    - Install temporary prompts (like yellow stickies with short reminders on them) near the places where remembering is most important.
- **TIP 265** – Assign responsibility for overseeing your home's energy-use to a family member.
    - With this family member, share the energy bills from before the family project and those received during the project, and discuss with them how the bills reflect progress and how far you may have to go.
    - Agree as a family that occasional nagging will be ok for awhile, because "this is a worthwhile cause, and we will change our energy-use behavior or we will give up on the project; either way the nagging won't last forever."
    - Rotate the oversight responsibility among family members to gain different practical perspectives on the opportunities and challenges.
    - Help to summarize and memorialize your family's low-cost/no-cost energy-saving experience by documenting it for academic credit (term paper, or

extra credit paper, or science project), or for the local paper, or for the church or civic organization newsletter.

- **TIP 270** – Reward the family for success in lowering energy costs:
    - Plan a specific beneficial use for the energy dollars saved
        - short-term: e.g., a big dessert treat
        - long-term: e.g., a needed home improvement or productivity enhancement
    - Give credit to family members who made a big difference when you share these tips, and how things worked for you (or not), with your extended family, friends and neighbors.

Back to Top

OTHER RESOURCES
(under construction; please check back. Your suggestions are welcome.)

- END -

Tom Potter
Director, Rural Programs
Southwest Energy Efficiency Project (SWEEP)
303.503.2230 tpotter@swenergy.org