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STATE OF MICHIGAN
DEPARTMENT OF TREASURY
LANSING

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DATE: December 30, 2008

TO: Assessors and Equalization Directors

FROM: State Tax Commission

SUBJECT: Small Home and Farm Alternative Energy Systems

The following information applies to residential, agricultural and business systems, where the system is primarily intended to supply energy for use directly by the owner of the system, even if excess energy is also sold to the local public utility.

The State Tax Commission has received a number of inquiries from assessors relating to recommended valuation procedures for valuing home and farm alternative energy systems such wind turbines and solar arrays. Assessment and Certification Division staff has investigated and determined that the technology used in wind and solar energy applications for the home and farm is still developing, that there are a variety of alternative technologies available, and that there is not complete consensus as to the best system or systems. This memorandum is intended to provide preliminary guidance, until such time as more reliable information becomes available.

1. Whenever possible, local costs should be investigated and considered in determining the value of wind energy and solar energy systems. Assessors are cautioned that such costs must include, freight, sales tax and installation. The State Commission anticipates that property owners will often perform some or all of the installation of alternative energy systems themselves. For this reason, the Commission considers it inappropriate for the assessor to rely on taxpayer provided costs unless the assessor has first verified that such costs reflect local market costs for a complete installation of the system.

2. The State Tax Commission had determined that solar array energy systems are typically real property in nature and should be assessed as an improvement to the real property on which they are located, unless the owner of the array does not own the land. Solar arrays located on real property that is not owned by the owner of the solar array should be assessed on the personal property roll. MCL 211.8(l) provides that wind energy systems must be placed on the personal property portion of the assessment roll. When appropriate, assessors should send personal property statements to farm operators and homeowners. The Commission directs that costs of alternative energy systems which are assessed as personal property should be reported in Section G of the personal property statement, Form L-4175 (Treasury Form 632). Because homeowners and farm operators rarely receive a personal property statement, the Commission suggests that assessors may wish to include a letter of explanation and may wish to offer assistance in the completion of the statement.

3. It is the determination of the State Tax Commission that wind energy systems and solar array energy systems assessed as personal property are not exempt under either MCL 211.9(f) or MCL 211.9(j), for the reason that such systems do not meet the definitional requirements of those exemption provisions.

4. The State Tax Commission reminds assessors that even if local costs are developed for the year of installation of a wind energy system or of a solar array energy system, the cost must thereafter be adjusted for each subsequent assessment year to reflect both changes in replacement cost and depreciation as the system ages. The Commission suggests that in cases where reliable costs can be determined, or developed, for the complete installation of a wind energy system or a solar array energy system in the year of installation, the following valuation multiplier table may be useful in estimating the value of the system as it ages, to wit:

Home and Farm Alternative Energy Systems

AGE	Multiplier
1	0.90
2	0.88
3	0.84
4	0.83
5	0.79
6	0.72
7	0.65
8	0.58
9	0.54
10	0.49
11	0.43
12	0.39
13 and Older	0.35

This table is currently suggested for use only for the 2009 assessment year.

5. In cases where local costs, including freight, sales tax and installation cannot be obtained, the research of the Commission's staff indicates the following generalizations, which may assist in estimating the original cost of the system:

   a) Small wind energy systems typically installed by homeowners and farm operations most often consist of 1 or 2 kilowatt systems, 7.5 kilowatt systems and 10 kilowatt systems.

   b) The 1 kilowatt systems are **used for smaller off-grid applications** and are sometimes accompanied by a solar array and the 2 kilowatt systems generally consist of 2 separate 1 kilowatt turbines (generators) on separate towers. The 1 kilowatt systems produce 90 to 150 kilowatt hours of energy per month from each turbine (depending

on the availability of wind). These systems generally include a battery storage device and are frequently accompanied by a backup diesel or propane generator (which should be valued separately). The components, and cost of components, and installation cost, of these systems are often as follow:

- Tilt-up towers that generally cost between $28 and $30 per foot of height each.
- 1 kilowatt turbines that generally cost between $2,700 and $2,900 each
- A battery system that generally costs between $500 (where there is a supplementary solar array) and $1,000.
- A supplementary solar array, wiring and mounts that costs between $1,300 and $1,400.
- An inverter system (a circuit that converts DC current into AC current so that it can be used in traditional home applications or to sell energy onto the commercial power grid) that costs between $1,100 and $1,300 per kilowatt of capacity.
- Installation costs from $5,000 for 1 kilowatt systems, to $8,000 for 1kilowatt systems with supplementary solar arrays, to $9,000 for dual tower systems.

Not all of these components are present in every system, so an inquiry must be made to determine what components are present.

c) The 7.5 kilowatt systems produce 400 to 1,500 kilowatt hours of energy per month and are used **to provide service to larger remote facilities, often backed-up to generator-provided service**. These systems generally include a battery storage device and are frequently accompanied by a backup diesel or propane generator (which should be valued separately). A supplementary solar array can increase the dependability and effective capacity of the system. The components, and cost of components, and installation cost of these systems, are often as follow:

- Lattice or Guyed lattice towers that generally cost between $160 and $190 per foot of height for a 60 foot tower, between $135 and $160 foot of height for an 80 foot tower and between $125 and $150 per foot of height for a 100 foot tower.
- A tower wiring kit that costs between $12 and $14 per foot of tower height.
- 7.5 kilowatt turbines that generally cost between $24,000 and $26,000.
- A battery system that generally costs between $14,000 and $16,000.
- An inverter system (a circuit that converts DC current into AC current so that it can be used in traditional home applications or to sell energy onto the commercial power grid) that costs between $4,500 and $5,000.
- A supplementary solar array, wiring and mounts that costs between $14,000 and $16,000.
- Installation costs from $4,000 to $35,000, with most installations costing between $8,000 and $25,000. If a supplementary solar array is present, the

installation of the array adds between $4,000 and $5,000 to the cost of installation.

Not all of these components are present in every system, so an inquiry must be made to determine what components are present.

d) 10 kilowatt systems **are generally the most economical for most homeowners and farm and business operations** (the 7.5 kilowatt systems being used primarily in remote locations and to back-up other systems). The 10 kilowatt systems produce 600 to 2,000 kilowatt hours of energy per month for each turbine (depending on the availability of wind) and are used for homes and businesses that use at least 1,000 kilowatt hours per month. These systems generally do not include a battery storage device and, instead, sell excess electricity to the commercial electric grid. These systems also usually connect to the owner's circuit breaker panel and have no separate inverter. The components and cost of components and installation of these systems are often as follow:

- Guyed lattice towers with costs similar to those for the 7.5 kilowatt towers, or monopole towers that generally have an approximate cost of from $250 per foot of height for a 60 foot tower, to $300 per foot of height for a 90 foot tower to $350 per foot of height for a 120 foot tower.
- 10 kilowatt turbines that generally cost between $28,000 and $32,000.
- A tower wiring kit that cost between $12 and $14 per foot of tower height.
- Installation costs from $14,000 to $16,000.

6. According to the United States Department of Energy a solar energy system has an installed cost of between $6,000 and $8,000 per kilowatt of capacity. The same source indicates that a 2 kilowatt system meets the energy needs of very energy–efficient homes and a 5 kilowatt system can completely meet the needs of many conventional homes.