# ENERGY STAR® Program Requirements for Geothermal Heat Pumps

## Partner Commitments – Draft 1

**Note:** The revisions presented in this Draft 1 Version 3.0 specification are based on a proposal submitted by the Air- Conditioning, Heating, and Refrigeration Institute (AHRI). To facilitate and expedite the review process, EPA has tracked key proposed editorial changes throughout the document in red font. New performance levels are also proposed in Section 3, below. All interested stakeholders are encouraged to provide additional feedback and suggestions to ghps@energystar.gov **by October 9, 2009**. The AHRI proposal can be viewed on the ENERGY STAR Web site at: www.energystar.gov/revisedspecs.

## Commitment

The following are the terms of the ENERGY STAR Partnership Agreement as it pertains to the manufacturing of ENERGY STAR qualified geothermal heat pumps. The ENERGY STAR Partner must adhere to the following program requirements:

- comply with current ENERGY STAR Eligibility Criteria, defining the performance criteria that must be met for use of the ENERGY STAR certification mark on commercial griddles and specifying the testing criteria for commercial griddles. EPA may, at its discretion, conduct tests on products that are referred to as ENERGY STAR qualified. These products may be obtained on the open market, or voluntarily supplied by Partner at EPA's request;

- comply with current ENERGY STAR Identity Guidelines, describing how the ENERGY STAR marks and name may be used. Partner is responsible for adhering to these guidelines and for ensuring that its authorized representatives, such as advertising agencies, dealers, and distributors, are also in compliance;

- qualify at least one ENERGY STAR labeled geothermal heat pump model within one year of activating the geothermal heat pumps portion of the agreement. When Partner qualifies the product, it must meet the specification (e.g., Tier 1 or 2) in effect at that time;

- provide clear and consistent labeling of ENERGY STAR qualified geothermal heat pumps. The ENERGY STAR mark must be clearly displayed in product literature (i.e., user manuals, spec sheets, etc.) and on the manufacturer's Internet site where information about ENERGY STAR qualified models is displayed. It is also recommended that the mark appear on the top/front of the product and on the product packaging;

- offer and encourage training to distributors and/or contractors on the following issues: proper equipment installation and hookup, distribution systems and their effect on performance, proper domestic water heater connection for desuperheater or demand water heating, code compliance, and proper use of the Manual J calculation, or other equivalent calculation, in order to encourage proper sizing of equipment. In addition, Partner should strive to use contractors or loop installers who have received training on the design and installation of the ground heat exchanger and that provide warranty protection for the integrity and performance of the ground heat exchanger for at least two years. Ground heat exchanger training may be provided by Partner or a well regarded training program such as the International Ground Source Heat Pump Association's. Partner shall focus its ENERGY STAR marketing efforts in regions where contractors and loop installers have received training and provide warranties;

- offer a means to provide some or all of the domestic water heating through the use of a

desuperheater, integrated demand water heater, or stand-alone demand water heating model. Partner will strive to ensure that customers, distributors, and contractors are aware of the benefits of using a geothermal heat pump system to provide water heating in its marketing materials, installation manuals, and training programs;

**Note:** EPA recognizes that there are additional energy savings that could be realized by utilizing the heat garnered by the geothermal heat pump system to also provide domestic water heating. However, requiring this capability for ENERGY STAR qualification presents two challenges: (1) it is difficult to ensure that the geothermal heat pump is indeed sold and installed with this capability, maintaining ENERGY STAR qualification and (2) requiring specified technologies eliminates the opportunity to incorporate other efficient water heating systems, such as solar. Instead, EPA is proposing that partnering manufacturers **offer the means for providing** some or all of the domestic water heating, through the use of the technologies listed above, and convey the additional benefits of incorporating these technologies in marketing and other educational materials. EPA will also include this information on the ENERGY STAR geothermal heat pump Web page and encourage consumers to inquire about this capability.

- provide to EPA, on an annual basis, an updated list of ENERGY STAR qualifying commercial griddle models. Once the Partner submits its first list of ENERGY STAR qualified commercial griddles, the Partner will be listed as an ENERGY STAR Partner. Partner must provide annual updates in order to remain on the list of participating product manufacturers;

- provide to EPA, on an annual basis, unit shipment data or other market indicators to assist in determining the market penetration of ENERGY STAR. Specifically, Partner must submit the total number of ENERGY STAR qualified commercial griddles shipped (in units by model) or an equivalent measurement as agreed to in advance by EPA and Partner. Partner is also encouraged to provide ENERGY STAR qualified unit shipment data segmented by meaningful product characteristics (e.g., capacity, size, speed, or other as relevant), total unit shipments for each model in its product line, and percent of total unit shipments that qualify as ENERGY STAR. The data for each calendar year should be submitted to EPA, preferably in electronic format, no later than the following March and may be provided directly from the Partner or through a third party. The data will be used by EPA only for program evaluation purposes and will be closely controlled. If requested under the Freedom of Information Act (FOIA), EPA will argue that the data is exempt. Any information used will be masked by EPA so as to protect the confidentiality of the Partner;

- notify EPA of a change in the designated responsible party or contacts for geothermal heat pumps within 30 days.

## Performance for Special Distinction

In order to receive additional recognition and/or support from EPA for its efforts within the Partnership, the ENERGY STAR Partner may consider the following voluntary measures and should keep EPA informed on the progress of these efforts:

- consider energy efficiency improvements in company facilities and pursue the ENERGY STAR mark for buildings;

- purchase ENERGY STAR qualified products. Revise the company purchasing or procurement specifications to include ENERGY STAR. Provide procurement officials' contact information to EPA for periodic updates and coordination. Circulate general ENERGY STAR qualified product information to employees for use when purchasing products for their homes;

- ensure the power management feature is enabled on all ENERGY STAR qualified monitors in use in company facilities, particularly upon installation and after service is performed;

- provide general information about the ENERGY STAR program to employees whose jobs are relevant to the development, marketing, sales, and service of current ENERGY STAR qualified product models;

- feature the ENERGY STAR mark(s) on Partner Web site and in other promotional materials. If information concerning ENERGY STAR is provided on the Partner Web site as specified by the ENERGY STAR Web Linking Policy (this document can be found in the Partner Resources section on the ENERGY STAR Web site at www.energystar.gov), EPA may provide links where appropriate to the Partner Web site;

- provide a simple plan to EPA outlining specific measures Partner plans to undertake beyond the program requirements listed above. By doing so, EPA may be able to coordinate, communicate, and/or promote Partner's activities, provide an EPA representative, or include news about the event in the ENERGY STAR newsletter, on the ENERGY STAR Web pages, etc. The plan may be as simple as providing a list of planned activities or planned milestones that Partner would like EPA to be aware of. For example, activities may include: (1) increase the availability of ENERGY STAR labeled products by converting the entire product line within two years to meet ENERGY STAR guidelines; (2) demonstrate the economic and environmental benefits of energy efficiency through special in-store displays twice a year; (3) provide information to users (via the Web site and user's manual) about energy-saving features and operating characteristics of ENERGY STAR qualified products, and (4) build awareness of the ENERGY STAR Partnership and brand identity by collaborating with EPA on one print advertorial and one live press event;

- provide quarterly, written updates to EPA as to the efforts undertaken by Partner to increase availability of ENERGY STAR qualified products, and to promote awareness of ENERGY STAR and its message.

- join EPA's SmartWay Transport Partnership to improve the environmental performance of the company's shipping operations. SmartWay Transport works with freight carriers, shippers, and other stakeholders in the goods movement industry to reduce fuel consumption, greenhouse gases, and air pollution. For more information on SmartWay, visit www.epa.gov/smartway.

- join EPA's Climate Leaders Partnership to inventory and reduce greenhouse gas emissions. Through participation companies create a credible record of their accomplishments and receive EPA recognition as corporate environmental leaders. For more information on Climate Leaders, visit www.epa.gov/climateleaders.

- join EPA's Green Power partnership. EPA's Green Power Partnership encourages organizations to buy green power as a way to reduce the environmental impacts associated with traditional fossil fuel-based electricity use. The partnership includes a diverse set of organizations including Fortune 500 companies, small and medium businesses, government institutions as well as a growing number of colleges and universities, visit http://www.epa.gov/grnpower.

# ENERGY STAR® Program Requirements for Geothermal Heat Pumps

## Eligibility Criteria – Draft 1

Below is the **Draft 1** Version 3.0 product specification for ENERGY STAR qualified geothermal heat pumps. A product must meet all of the identified criteria if it is to be labeled as ENERGY STAR by its manufacturer.

**1) Definitions:** Below are the definitions of the relevant terms in this document.

> **Note:** Edits are proposed throughout this section to more clearly define the scope of this Version 3.0 specification.

A. Geothermal Heat Pump: A geothermal heat pump uses the thermal energy of the ground or groundwater to provide residential space conditioning and/or domestic water heating. A geothermal heat pump model normally consists of one or more factory-made assemblies that include indoor conditioning and/or domestic water heat exchanger(s), compressors, and a ground-side heat exchanger. A geothermal heat pump model may provide space heating, space cooling, domestic water heating, or a combination of these functions and may also include the functions of liquid circulation, thermal storage, air circulation, air cleaning, dehumidifying or humidifying. A geothermal heat pump system generally consists of one or more geothermal heat pump models, the ground heat exchanger(s), the air and/or hydronic space conditioning distribution system(s), temperature controls, and thermal storage tanks.

> **Note:** The previous requirement that *some or all of the domestic water heating must be provided by the geothermal heat pump through the use of a desuperheater, integrated demand water heater, or a separately installed compressor that provides demand water heating* has been removed. Instead, manufacturing partners will be required to offer the option of using a desuperheater, integrated demand water heater, or stand-alone demand water heater, outlining the benefits of incorporating these technologies into the geothermal heat pump system. Details are provided in the Partner Commitments section, above.

B. Single-Stage: Geothermal heat pumps that are designed to operate at one stage and one capacity.

C. Multi-Stage: Geothermal heat pumps that are designed to operate at more than one stage or capacity through the use of technologies such as multiple stage compressors, dual compressors, variable speed compressors, etc. Multi-stage models are more efficient while running at lower capacities, but have the capability to supply more heating or cooling using higher capacities when required.

> **Note:** The term “speed”, which was previously referenced in definitions 1B and 1C above, has been replaced with “stage” because these products do not typically have discrete speeds. Multi-stage products modulate between different modes of operation depending on space conditioning needs.

D. Ground Heat Exchanger: The method by which heat is exchanged with the ground, groundwater or surface water. Geothermal heat pumps may use any form of ground heat exchange, which includes horizontal, vertical or submerged surface water closed loops; open loops using ground water, reclaimed water, or surface water; or direct refrigerant-to-ground heat exchange.

E. Closed Loop: A ground heat exchange method in which the heat transfer fluid is permanently contained in a closed piping system. Also called a *ground-loop* system.

F. Open Loop: A ground heat exchange method in which the heat transfer fluid is part of a larger environment. The most common open loop systems use ground water, reclaimed water, or surface water as the heat transfer medium. Also called a *ground-water* system.

G. Water-to-Air: A geothermal heat pump model that provides space conditioning primarily by the use of an indoor air heat exchange coil. Water-to-air models may also provide domestic water heating and hydronic space heating by using desuperheater and/or demand water heating functions.

H. Water-to-Water: A geothermal heat pump model that provides space conditioning and/or domestic water heating by the use of indoor refrigerant-to-water heat exchanger(s). Water-to-water models may provide domestic water heating by using desuperheater and/or demand water heating functions.

**Note:** A definition was added for water-to-water geothermal heat pumps. These product types will be eligible for ENERGY STAR qualification under the new Version 3.0.

J. Direct Geoexchange (DGX): A geothermal heat pump model in which the refrigerant is circulated in pipes buried in the ground, rather than using a secondary heat transfer fluid, such as water or antifreeze solution in a separate closed loop.

K. Desuperheater: A partial heat recovery system that captures heat from the hot refrigerant gas as it leaves the heat pump compressor and transfers it to the domestic hot water. Desuperheaters provide hot water only while the heat pump is providing space conditioning.

L. Demand Water Heating: Demand geothermal heat pump water heating models provides all, or nearly all, of the domestic hot water needs even when space conditioning is not required. This may be accomplished by either stand-alone domestic water heating models or integrated models that use the same compressor for both space conditioning and domestic water heating. This product type is sometimes referred to as *dedicated* or *full-time* water heaters.

M. Coefficient of Performance (COP): A measure of efficiency in the heating mode that represents the ratio of total heating capacity to electrical energy input. For the purpose of this specification, COP will be calculated for Closed Loop and Open Loop systems in accordance with the International Standards Organization (ISO) Test Standard 13256-1 or 13256-2 as stated in Section 4 below. For DGX systems, COP will be calculated in accordance with the Air-Conditioning Heating, and Refrigeration Institute (AHRI) 870 conditions.

N. Energy Efficiency Ratio (EER): A measure of efficiency in the cooling mode that represents the ratio of total cooling capacity to electrical energy input. For the purpose of this specification, EER will be calculated for Closed Loop and Open Loop systems in accordance with ISO 13256-1 or 13256-2 as stated in Section 4 below. For DX systems, EER will be calculated in accordance with AHRI 870 conditions.

**Note:** Reference to ISO 13256-2 has been added to the definitions for COP and EER to address water-to-water geothermal heat pumps. This reference is also included in Section 4, below.

O. Manual J Calculation: A calculation performed to determine the heating load for a residence or small commercial building. The calculation shall include site-specific characteristics such as regional weather data, building framing materials, building insulation levels, building air infiltration levels, and

window area. The calculation follows procedures and protocols developed by the Air Conditioning Contractors of America (ACCA).[1]

P. Manufacturer Limited Warranty: Manufacturer limited warranty is an assurance by the Partner that purchased equipment is warranted for a certain required amount of time. The exact terms of the limited warranty, given the minimum specifications, shall be determined by the Partner.

**2) Qualifying Products:** For purposes of ENERGY STAR qualification, geothermal heat pumps include the following: open loop, closed loop, and DGX that are powered by single phase current. The specifications in Section 3 apply to single stage models. Multi-stage models may be qualified based on EER=(highest rated capacity EER+lowest rated capacity EER)/2; and COP=(highest rated capacity COP+lowest rated capacity COP)/2.

**Note:** EPA's intention in requiring that geothermal heat pumps be powered by *single phase current* is to limit the specification to equipment designed specifically for residential use. EPA is interested in feedback on whether the program should be expanded to units designed for small commercial use (i.e., 3-phase). How do these units differ in regards to performance and/or capacity? Would EPA need to incorporate a size/capacity cap to exclude units designed for much larger commercial and industrial spaces?

Based on the understanding that multi-stage units don't have discrete speeds, edits are proposed to the way in which efficiency for these product types is calculated based on highest and lowest rated capacity (as opposed to highest and lowest speed).

**3) Efficiency Requirements for Qualifying Products:** Only those product types listed in Section 2 that meet the criteria below may qualify as ENERGY STAR.

**Table 1: Tier 1 Requirements (December 1, 2009)**

| Product Type | EER | COP |
|---|---|---|
| **Water-to-Air** | | |
| Closed Loop Water-to-Air | 14.1 | 3.3 |
| Open Loop Water-to-Air | 16.2 | 3.6 |
| **Water-to-Water** | | |
| Closed Loop Water-to-Water | 15.1 | 3.0 |
| Open Loop Water-to-Water | 19.1 | 3.4 |
| **DGX** | | |
| DGX | 15.0 | 3.5 |

**Table 2: Tier 2 Requirements (August 1, 2010)**

| Product Type | EER | COP |
|---|---|---|
| **Water-to-Air** | | |
| Closed Loop Water-to-Air | 16.1 | 3.5 |
| Open Loop Water-to-Air | 18.2 | 3.8 |
| **Water-to-Water** | | |
| Closed Loop Water-to-Water | 15.1 | 3.0 |
| Open Loop Water-to-Water | 19.1 | 3.4 |
| **DGX** | | |
| DGX | 16.0 | 3.6 |

[1] Air Conditioning Contractors of America (ACCA), 2800 Shirlington Road, Suite 300, Arlington, VA 22206.

| Table 3: Tier 3 Requirements (January 1, 2012) | | |
|---|---|---|
| **Product Type** | **EER** | **COP** |
| **Water-to-Air** | | |
| Closed Loop Water-to-Air | 17.1 | 3.6 |
| Open Loop Water-to-Air | 21.1 | 4.1 |
| **Water-to-Water** | | |
| Closed Loop Water-to-Water | 16.1 | 3.1 |
| Open Loop Water-to-Water | 20.1 | 3.5 |
| **DGX** | | |
| DGX | 16.0 | 3.6 |

**Note:** Geothermal heat pumps heat and cool buildings taking advantage of the moderate temperatures in the ground and delivering higher efficiencies compared to air-source varieties. They also offer other advantages including greater ability to deliver heat (because the ground does not experience the temperature extremes and fluctuations of the outside air), long life expectancy, lower maintenance, quieter operation, and the opportunity to take advantage of harnessed heat energy to also improve water heating efficiency. Further, they involve installation requirements significantly different than those for air source heat pumps, including a need for sufficient land area with appropriate soil characteristics to accommodate a network of buried pipes. Given this combination of features and constraints, EPA believes that consumers likely decide at a general level whether or not to pursue a geothermal heat pump and then look to see what heat pump will be best for them, and therefore addresses geothermal heat pumps as a separate category in the ENERGY STAR Program.

For purposes of setting performance requirements, this Version 3.0 specification divides geothermal heat pump products into a number of subcategories designed to provide consumers options relevant to their particular circumstances. Water-to-Air products are treated separately from Water-to-Water because consumers will choose one or the other based on whether their house requires forced air or radiant heat. Within those subcategories, closed loop and open loop are treated separately because open loop requires on-site water supply such as a well or pond. Changes are proposed to the performance levels for Water-to-Air and DGX products (Tiers 2 & 3) and new levels are proposed for Water-to-Water products (Tier 1) based on efficiency improvements indicated by performance data associated with products currently listed in the AHRI Directory of Certified Products (Water-to-Air and DGX) and submitted directly to EPA on behalf of manufacturers (Water-to-Water).

EPA expects installed costs associated with geothermal heat pump models meeting the proposed specifications to be comparable to those associated with geothermal heat pump models qualified under the current Version 2.0 specification. The 30% federal tax credit effective through 2016, which EPA plans to help educate consumers about, together with the added energy savings associated with this revision, improve the cost-effectiveness of these products significantly.

Manufacturers not currently AHRI members are welcome to submit additional data for EPA consideration in setting levels for all three geothermal heat pump types. Data should be submitted no later than October 9, 2009.

**4)** **Warranty Requirements:** Partner must provide, as standard, a manufacturer limited warranty for its ENERGY STAR qualified geothermal heat pump models for all parts and labor for a minimum of two years. The major refrigerant circuit components, including the compressor(s), heat exchanger(s), and expansion and reversing valve(s) will be warranted for parts and labor for a minimum of five years.

**Note:** Qualified products must continue to meet the same warranty requirements as outlined in Version 2.0. EPA has created a separate warranty section, above, so that manufacturers can more quickly locate these requirements.

**5) Test Criteria:** Partner is required to perform tests and self-certify those product models that meet the ENERGY STAR guidelines. The test results must be reported to EPA using the Geothermal Heat Pump Qualifying Product Information (QPI) Form. When testing geothermal heat pumps, the partner must use the following test procedures to determine ENERGY STAR compliance:

A. Closed Loop: Systems shall qualify under rating conditions in accordance with ISO 13256-1 for water-to-air models or ISO 13256-2 for water-to-water models.

B. Open Loop: Systems shall qualify under rating conditions in accordance with ISO 13256-1 for water-to-air models or ISO 13256-2 for water-to-water models.

C. DGX: Systems shall qualify under rating conditions in accordance with AHRI 870.

**6) Tier 2 Product Certification Requirements (Effective August 1, 2010):** To participate in the ENERGY STAR program, each model must be certified by AHRI or another such organization as approved by EPA (see Section 7, Requirements of Organizations Certifying Products for ENERGY STAR). Certification testing includes both initial qualification testing, as well as ongoing verification testing. Certification testing must be conducted according to the Test Criteria described in Section 5.

**7) Requirements of Organizations Certifying Products for ENERGY STAR:** This specification does not grant any organization the exclusive right to certify the performance of a geothermal heat pump for ENERGY STAR qualification. EPA will maintain a list of organizations authorized under this specification. As EPA approves certification organizations, it will add them to this list. EPA will consider the following elements when reviewing a certification organization for inclusion on this list:

A. Laboratory Requirements:

Laboratory accreditation: To test geothermal heat pumps under this specification, the certification organization must ensure that all ENERGY STAR models are tested by an independent 3rd party laboratory that is accredited by an accreditation body that is a signatory, in good standing, to a mutual recognition arrangement of a laboratory accreditation cooperation (i.e. ILAC[2], APLAC[3], etc.) that verifies, by evaluation and peer assessment, that its signatory members are in full compliance with ISO/IEC 17011 and that their accredited laboratories comply with ISO/IEC 17025. Laboratories must be specifically qualified to carry out tests to determine whether geothermal heat pumps meet the key performance criteria as outlined in this document. A laboratory's Scope of Accreditation must reflect its specific competence to carry out the test procedures referenced in Section 5 of this specification.

B. Verification procedure requirements:

1. The organization shall have in place a verification testing procedure.

2. Product procurement: Products to undergo verification testing shall be procured from the marketplace. In order to ensure the organization's ability to procure a production unit, the organization shall not inform the Partner which models will be tested or where they will be obtained. Where this is not possible, and the products must be procured from the Partner, the organization shall ensure the samples are randomly selected from the production line.

3. Frequency of testing, and number of products to be tested: The organization shall ensure that at least 90% of each Partner's certified base model products that are ENERGY STAR qualified undergo verification testing every three years. The proportion or number of a

[2] International Laboratory Accreditation Cooperation
[3] Asia Pacific Laboratory Accreditation Cooperation

Partner's products to be tested annually may be determined by the certification organization.

4. Resolution of failures: The organization shall have in place a procedure to resolve product failures, and provide EPA with details of this procedure.

C. Challenge procedure requirements:

1. The organization shall have in place a challenge testing procedure.

2. Product procurement and resolution of failures shall follow Section 7.B, Verification procedure requirements.

D. Certification of base-derived or similar products: The certification organization shall not certify an ENERGY STAR qualified product based on the ratings of another product unless the differences between the two products are limited to those that do not adversely affect product performance. Examples of acceptable differences include but are not limited to color, finish, and nameplate.

E. Membership requirements: The organization shall not require that a party seeking product certification be a member of the organization. Product verification and challenge testing shall only require that the product has been certified by the organization.

F. Consideration of the organization's procedures: The certification, verification, and challenge testing procedures, as well as all other relevant aspects of any certification organization, must be available in written format to current or prospective ENERGY STAR geothermal heat pump program Partners, and must be submitted in this format to EPA for its review.

G. Reporting results to EPA: The certification organization shall report to EPA on an annual basis the outcomes of verification and challenge testing for all ENERGY STAR qualified products certified by the organization. Data reporting shall follow the rounding and reporting rules included in the applicable test standard referenced in Section 4.

**Note:** As part of a program-wide effort by EPA to protect the integrity of the ENERGY STAR mark, EPA is proposing to require third party testing and certification for ENERGY STAR qualification. Several manufacturers already participate in the AHRI Certification Program. However, EPA will allow product certification from other third-party organizations as long as they meet the requirements presented in Section 7. These requirements are based on existing product certification programs administered by organizations such as AHRI, the Heating and Ventilating Institute (HVI), and the Air-Movement and Control Association (AMCA). Under this requirement, manufacturers will have the flexibility to choose the certification program they want to use for qualification and consumers will be assured that the results reported on the ENERGY STAR Web site have been third-party verified. Manufacturers who are not currently participating in a certification program have until August 1, 2010 to certify products for ENERGY STAR qualification. As of August 1, 2010, existing ENERGY STAR qualified models that have not been certified will be taken off the ENERGY STAR Web site and manufacturers will be asked to cease use of the ENERGY STAR mark when promoting these models. Stakeholders are encouraged to provide feedback on the proposed requirements of a certification organization.

**8) Effective Date:** The date that products must meet the requirements specified under the Version 3.0 geothermal heat pump specification will be defined as the effective date of the agreement.

A. Tier 1 Requirements: The first phase of this specification will commence on **December 1, 2009**. All products, including models originally qualified under the previous Version 2.0 specification, with a date of manufacture on or after **December 1, 2009**, must meet the new Version 3.0 Tier 1 requirements in order to qualify for ENERGY STAR. The date of manufacture is specific to each

unit and is the date (e.g., month and year) on which a unit is considered to be completely assembled.

B. Tier 2 Requirements: The second phase of this specification, Tier 2, shall commence on **August 1, 2010**. All products, including models originally qualified under Tier 1, with a date of manufacture on or after **August 1, 2010** must meet the new Tier 2 requirements in order to qualify for ENERGY STAR.

C. Tier 3 Requirements: The third phase of this specification, Tier 3, shall commence on **January 1, 2012**. All products, including models originally qualified under Tier 2, with a date of manufacture on or after **January 1, 2012**, must meet the new Tier 3 requirements in order to qualify for ENERGY STAR.

D. Elimination of Grandfathering: EPA will not allow grandfathering under this Version 3.0 ENERGY STAR specification. **ENERGY STAR qualification under previous Versions is not automatically granted for the life of the product model.** Therefore, any product sold, marketed, or identified by the manufacturing partner as ENERGY STAR must meet the current specification in effect at the time of manufacture of the product.

**Note:** Since water-to-water geothermal heat pumps are new to the ENERGY STAR program, EPA is proposing that Tier 1 take effect immediately following finalization. Tier 1 levels for water-to-air and DGX units remain unchanged. Stakeholders will have three weeks to review and comment on this Draft 1 document. Depending on the number and complexity of the comments received, EPA may decide to release another draft in mid to late October. The proposed Tier 1 effective date provides sufficient time for additional review and comment, if needed. It is EPA's goal to finalize this specification before the end of this year.

To allow partnering manufacturers sufficient time to transition to the new Tier 2 requirements for water-to-air and DGX equipment, EPA is proposing a nine month period between the Tier 1 and Tier 2 effective dates. On August 1, 2010, Tier 2 will replace Tier 1. At that time, any geothermal heat pump that does not meet the Tier 2 requirements will be removed from the ENERGY STAR qualified product list. Tier 2 requirements will remain unchanged for water-to-water units.

As of January 1, 2002, Tier 3 will replace Tier 2. At that time, all three geothermal heat pump types must meet new Tier 3 requirements to remain ENERGY STAR qualified.

EPA is proposing this tiered approach to encourage geothermal heat pump manufacturers to continue improving product design, increasing the savings to the end user, and to provide a clear road map for the expected performance levels, providing manufacturers sufficient time to meet new requirements.

**6) Future Specification Revisions:** EPA reserves the right to change the specification should technological and/or market changes affect its usefulness to consumers, industry, or the environment. In keeping with current policy, revisions to the specification are arrived at through industry discussions. In the event of a specification revision, please note that ENERGY STAR qualification is not automatically granted for the life of a product model. To carry the ENERGY STAR mark, a product model must meet the ENERGY STAR specification in effect on the model's date of manufacture.