



DEVELOPMENT OF A SOLAR RATING AND CERTIFICATION LABORATORY IN MINNESOTA

**A Report to the Legislature Prepared by the
Minnesota Department of Commerce Office of Energy Security
as required by Minnesota Laws 2008, Chapter 296. Sec 27**

January 15, 2009

OES wishes to thank the participants in the solar thermal technical stakeholder meeting who volunteered their time and expertise:

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- * John Dunlop, P.E., Renewable Energy Services, Principal
- * Sarah Hayden, Rural Renewable Energy Alliance, Director of Research and Outreach
- * Jim Huggins, Solar Rating and Certification Corporation, Technical Director
- * Scott Johnson, Natural Resources Research Institute UMD, Technician
- * Mike LeBeau, Conservation Technologies, President
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I. EXECUTIVE SUMMARY

As a consequence of the growing solar thermal market, new solar thermal collectors are regularly introduced into the marketplace. To determine the thermal performance, durability, and reliability of these new innovations, testing is of primary importance. In order to ensure consistency and representative results, tests of solar thermal collectors in the United States are carried out according to well-established procedures specified in the Solar Rating and Certification Corporation (SRCC) OG-100 standard for solar thermal technologies. SRCC OG-100 is the only nationally recognized certification in the United States for solar thermal collectors. This report and to date, SRCC standards, address only solar thermal technologies, and not solar electric.

While SRCC is well recognized and respected in the industry there are issues with the SRCC testing and certification process:

- The backlog of independent testing of solar collectors needed for SRCC certification may be stifling innovation and preventing new manufacturers from entering the marketplace.
- Current SRCC standards may not adequately consider air quality when air is exchanged directly between the solar collector and the building.

As a direct result of the above concerns, this report outlines considerations for a Minnesota-based solar rating and testing laboratory as required by Minnesota Laws 2008, Chapter 296. Sec 27.¹

The Office of Energy Security (OES) recommends that any new Minnesota-based solar thermal testing facility adopt the SRCC OG-100 standard and pursue SRCC accreditation. In addition to the testing required under the OG-100 standard, an assessment of the potential for air quality degradation should be characterized. Further, to minimize the required investment capital and to distribute operational costs among varying, but similarly aligned purposes, OES recommends that a Minnesota-based solar thermal testing laboratory be part of a larger renewable energy and energy efficiency testing center, such as proposed by University of Minnesota, Morris. This could potentially include testing of small wind turbines, building products, ground source heat pumps, and other energy technologies. Professional energy training could be considered as well. However, more study is required to estimate costs, need, and other details relevant to establishing such an operation in Minnesota.

¹ The director of the Office of Energy Security shall convene technical stakeholders who are expert in the design, manufacture, installation, and operation of solar energy systems to develop criteria and characteristics for a Minnesota-based solar rating and certification laboratory. The criteria shall include, but not be limited to, consideration of durability, cold-weather operations, and indoor air quality. The director shall develop and, by September 15, 2008, issue a request for proposals for the development of a plan, based on the criteria and characteristics developed by the stakeholder group, for a solar rating and certification laboratory in the state, including cost estimates. By January 15, 2009, the director shall submit a report to the chairs of the house and senate committees with jurisdiction over energy finance issues, detailing the responses to the request and making recommendations, including draft legislation.

II. BACKGROUND

A. Purpose

This document is in response to the legislative request for a report outlining considerations and costs of establishing a Minnesota-based solar rating and certification laboratory. The report focuses on solar thermal technologies for domestic hot water and space heating. Solar electricity is not considered here². This legislation arose from concerns that the nationally recognized solar thermal certification organization, Solar Rating and Certification Corporation (SRCC), certification process was inadequately serving Minnesota's solar thermal industry. In keeping with the legislation, on August 6, 2008 the Office of Energy Security (OES) convened a group of six technical stakeholders expert in the design, manufacture, installation, and operation of solar thermal systems to discuss criteria and characteristics for a Minnesota-based solar rating and certification laboratory.

The stakeholder group reached consensus that despite some valid industry concerns with SRCC, a Minnesota-based solar laboratory should become SRCC accredited and test to the OG-100 standard. The stakeholders also recognized a need for:

- reducing the time to complete testing for SRCC certification, which can take up to two years,
- working with SRCC to consider the benefits and costs of expanding long term durability testing in the SRCC OG-100 standard (the group, however, recognized the tradeoff of long term durability testing and added time to the testing process), and
- adding standards and test procedures to determine if effluent from solar hot air collectors might jeopardize indoor air quality.

As directed by the legislation, the group also discussed whether the SRCC's testing methods accurately predict efficiency during cold weather operations. The group agreed that collector efficiency in cold climates is accurately assessed using current testing methods, and that no action is needed to improve cold weather characterization.

On September 15, 2008, OES issued a Request for Information (RFI) for the development of a plan for a solar rating and certification laboratory with associated cost estimates. OES received two responses, one from the Hunt Utilities Group and one from University of Minnesota, Morris.

A summary of these responses for establishing a solar laboratory in Minnesota is outlined in this report. However, additional research is needed to inform the process of pursuing a solar testing laboratory in Minnesota.

B. Solar thermal in Minnesota today

Despite its northern climate, Minnesota's solar potential is comparable to that of Houston, Texas; Jacksonville, Florida; and San Francisco, California.

² The Solar Rating and Certification Corporation (SRCC) certifies only solar thermal collectors and systems at this time.

Water heating and space heating systems are major consumers of energy in Minnesota. Using a solar domestic hot water system, a Minnesota household can reasonably meet 75% of its domestic hot water load annually, while a solar space heating system can meet 20-30% of a building's space heating load. Solar thermal is one of the few options for renewable heating.

Minnesota is home to at least three solar thermal manufacturers with other manufacturers expressing intent to expand their business to include solar thermal collectors and related equipment. Additional SRCC accredited testing labs would reduce the time necessary for Minnesota manufacturers to reach the marketplace with new innovations.

C. Solar Rating and Certification Corporation

In 1980, the non-profit Solar Rating and Certification Corporation, SRCC, was established to develop and implement certification programs and national rating standards for solar thermal equipment. The founding of SRCC was the result of a collaborative effort of several state energy offices, including Minnesota's, to address the need for a uniform, nationally-recognized rating and certification system for solar thermal collectors. As of the time of this writing, SRCC has two independent accredited laboratories to perform testing for certification. They are:

Bodycote Materials Testing

Bodycote Ortech
2395 Speakman Drive
Mississauga, Ontario L5K 1B3
Canada
Telephone: (905) 822-4111 Ext 544
Fax: (905) 823-1446
Contact: Alfred Brunger
Web: <http://www.na.bodycote-mt.com/>
E-mail: brunger.a@bodycote.ca

Florida Solar Energy Center

1679 Clearlake Road
Cocoa, FL 32922-5703
Telephone: (321) 638-1501
Fax: (321) 638-1010
Web: <http://www.fsec.ucf.edu>
E-mail: sue@fsec.ucf.edu

SRCC standards are intended to provide product credibility and standardized comparisons of solar energy products. SRCC's mission is to benefit a triad of interests: 1) the solar energy industry through validating performance claims; 2) solar consumers by offering consumer protection; and 3) state and federal regulatory bodies by establishing criteria for incentive programs and building codes.³ Since the 1980s, the Minnesota State Building Code has required the use of SRCC OG-100 certified collectors in solar thermal installations statewide. (2007 *Minnesota State Building Code, Chapter 1325.*)

The federal government offers tax incentives for solar thermal installations. To qualify, the solar thermal equipment must be certified by SRCC or a comparable entity endorsed by the state in which the solar equipment is installed. Since only Florida specifies a state certification standard, SRCC certification is a necessary step for manufacturers who wish to market their equipment widely in the United States.

³ OG100 Application Package for Solar Collector Certification Program. http://www.solar-rating.org/cert_application/instructions/OG100WEB_APPL_20071107_Instructions.pdf; 4 Jan. 2009.

Eleven states require SRCC certification for solar thermal rebate programs. They are California, Delaware, Illinois, Louisiana, Maine, Maryland, Minnesota, Oregon, Rhode Island, Vermont and Wisconsin. Florida requires that all installed solar systems be approved by the Florida Solar Energy Center. Illinois also allows systems to be certified by an organization comparable to SRCC. Twelve states offer tax incentives with at least seven (Arizona, Georgia, New Mexico, North Carolina, Oregon, South Carolina, and Utah) tying programs to SRCC certification. Kentucky has a solar thermal loan program that requires SRCC or comparable certification. At least nineteen states link incentive programs to SRCC certification.⁴

SRCC certifies solar equipment of various types tested under specified protocols.⁵ Manufacturers of solar hot air collectors must send their equipment to Bodycote Materials Testing in Ontario, the only laboratory currently accredited by SRCC to perform testing on solar hot air collectors.

In addition to thermal performance measurements, SRCC requires [short term] durability and reliability testing of solar collectors for certification. These tests are identified in Table 1.

A concern for indoor air quality when fluids in solar systems are exchanged directly with interior air, such as with solar hot air collectors for space heating, was brought to the attention of the Minnesota Legislature by the Minnesota solar thermal industry. During the stakeholder meeting hosted by OES in August 2008, SRCC's technical director expressed a willingness to consider addressing the issue of air quality as a requirement for certification in the future.⁶ The SRCC Standards Committee is currently working on identifying a standard sufficient to ensure air quality is not impacted as a result of collector degradation over time.⁷

⁴ Database of State Incentives for Renewables and Efficiency. www.dsireusa.org. Jan. 13 2009.

⁵ The testing methods recognized by SRCC include: ISO Standard 9806-1, ISO Standard 9806-2, ISO Standard 9806-3, and ASHRAE Standard 93.

⁶ Jim Huggins, SRCC Technical Director (personal communication, August 13, 2008.)

⁷ Jim Huggins, SRCC Technical Director (personal communication, January 6, 2009).

Table 1. Durability and Reliability test requirements for SRCC certification.⁸

Test	Description
• Static Pressure Test	To subject the collector to an internal pressure higher than its normal operating pressure.
• 30-Day Exposure Test	To subject the collector to a severe thermal and radiation environment to determine or reveal any propensity for material degradation or design failure.
• Thermal Shock/Water Spray Test	Performed on three different days during peak stagnation, the collector is subjected to deluge water sprays to assess the collector's resistance to sudden thermal expansion or contraction.
• Thermal Shock/Cold Fill Test	To test the absorber and its assembly to determine integrity of the absorber to rapid expansion/contraction, resistance to leak, deformation or structural damage.
• Post Exposure Static Pressure Test	To determine if a loss of pressure, evidence of fluid leakage, or fluid path deterioration occurs after a collector has been stagnated under worst case conditions.
• Time Constant Determination	To determine the transient behavior of the collector or the time required to respond to abrupt changes in either insulation or inlet temperatures.
• Thermal Performance Test	To determine the instantaneous efficiency of the collector over a wide range of operating temperatures. ("Efficiency" is defined as the ratio of collected energy to the available energy falling upon the entire collector area.
• Incident Angle Modifier Test	The incident angle modifier needs to be determined in order to predict collector performance over a wide range of conditions. The modifier algorithm is used to modify the efficiency curve to account for changes in performance as a function of the sun's angle of incidence.
• Disassembly and Final Inspection	This includes outdoor exposure, external and internal thermal shock, rain penetration, mechanical load test and internal pressure test.

D. The case for additional solar testing laboratories

Since the federal solar tax incentives were introduced, there has been an increase in the number of manufacturers applying for SRCC certification. This has created a significant bottleneck in the industry's capacity to bring new innovations to the marketplace in a timely fashion—a duration long enough to create a hardship on existing manufacturers and to eliminate start up businesses. Given the recent federal tax incentive extension, there will likely be heightened manufacturer interest in certification of new products, including interest from Minnesota manufacturers. It is therefore relevant to note three concerns Minnesota's solar thermal manufacturers cite related to the current testing process for SRCC certification:

- The time required to complete testing once application is made is lengthy.
- Extra expense and time is involved with compliance for North American Free Trade Agreement rules and regulations for collectors sent to Bodycote Materials Laboratory for testing.
- Bodycote Materials Testing queue policy allows priority for Canadian manufacturers and distributors testing for CSA certification for testing, significantly lengthening the time between application submission and testing.

⁸ SRCC OG-100OG100 Application Package for Solar Collector Certification Program. November 2007.

According to SRCC and Bodycote Materials Testing (Bodycote), the testing process takes approximately 16 months to complete from the time of application at Bodycote and 24 months at the Florida Solar Energy Center (FSEC). Bodycote is the only laboratory accredited by SRCC to complete testing of solar hot air collectors and the only lab to provide testing for Canadian Standards Association (CSA) certification of solar hot water systems. One Minnesota manufacturer of solar hot air collectors, the Rural Renewable Energy Alliance (RREAL), applied to Bodycote for testing of their collector in December 2007 and has moved up in the queue from #20 to #6 as of this writing 13 months later. Part of the reason for delay in testing RREAL's collector is because the Canadian government has an agreement with Bodycote giving Canadian products priority status for testing for CSA certification. Also, Bodycote currently has the capacity to test just one collector at a time in their solar simulator with each collector taking a week or more to complete. To help address the backlog, Bodycote plans to add a second shift.⁹

When an accredited lab completes testing for certification, the results are sent directly to SRCC. SRCC generally issues a certification decision in less than a month once testing results are received. Therefore, there is agreement between SRCC and the solar thermal industry that accrediting additional testing laboratories would alleviate the lengthy wait between a manufacturer's application and a certification decision by SRCC. To this end, SRCC is recruiting new testing laboratories to reduce the waiting time for testing.¹⁰ The executive director of SRCC indicated a desire to accredit at least a couple additional labs, but pointed out that future demand for product testing could warrant even more testing facilities. For instance, the European Union is home to upwards of 15 sites accredited to perform European Standard EN 12975 testing for solar thermal certification, and still the queue for product testing is said to be 9-12 months.¹¹

⁹ Haigo Tikiryman, B.A.Sc.,P. Eng. Bodycote Materials Testing. (personal communication January 5, 2009).

¹⁰ SRCC <http://www.solar-rating.org/laboratories/laboratory.htm> January 2, 2009.

¹¹ Les Nelson and Jim Huggins (personal communication January 6, 2009).

III. FINDINGS

According to the executive and technical directors of SRCC, if there were a laboratory in Minnesota that met SRCC’s requirements for accreditation at this time, SRCC would welcome their application and likely approve the lab for accreditation.¹² This is not a standing offer, but rather, currently there is a recognized need to accredit additional laboratories as quickly as possible. OES is not aware of a laboratory in the state that is equipped to meet the SRCC accreditation specifications at this time, and establishing a lab from scratch could take 12-24 months or longer.

While a Minnesota-based SRCC testing laboratory has obvious benefits to the solar thermal industry, such a laboratory could also assist the state in achieving its energy goals. Table 2 gives a summary of some state and federal laws and policies to encourage solar thermal investment in Minnesota.

Table 2. Partial list of state and federal programs and policies that encourage solar thermal development in Minnesota.

Legislation	Description	Reference
Minnesota greenhouse gas emissions (GHG) reduction goal	Reduce GHG emissions to at a level at least: 15% below 2005 levels by 2015; 30% below 2005 levels by 2025; and 80% below 2005 levels by 2050	<i>2007 Minn Statutes 216H.02</i>
Energy planning goal ¹³ (25 x25)	25 percent of the total energy used in the state be derived from renewable energy resources by the year 2025	<i>Minn Statutes 2008, 216C.05 Subd. 2. (2)</i>
Onsite energy generation from renewable sources for state agency building projects	Requires state agencies to consider meeting at least 2% of the energy needs of new buildings from renewable sources located on site	<i>Minn Laws 2008, Chapter 179, Section 29 Section 16B.32 Subd. 1a.</i>
Conservation Improvement Program	utilities may use 5% of the total amount spent on Conservation Improvement Program to install solar energy projects	<i>Minn Statutes 2008, 216B.2411</i>
Minnesota Solar Hot Water Rebate Program (fully reserved)	State rebates for residential solar domestic hot water systems	<i>Minn Laws 2008 Chapter 363 Article 6 section 4.</i>
Renewable Energy Equipment Grant Program	Ongoing program to install cost effective renewable energy technologies into dwellings of low income households eligible for weatherization assistance	<i>Minn Laws 2007 Chapter 57 Article 2 Sec. 40. Minnesota Statutes 2006, section 239.101, subdivision 3</i>
Federal tax incentives for solar energy systems extended through December 31, 2016	Up to 30% federal tax credit and accelerated depreciation for solar energy projects; incentives require SRCC certification.	<i>Emergency Economic Stabilization Act of 2008</i>

¹² Les Nelson and Jim Huggins (personal communication January 6, 2009).

¹³ Solar thermal is one of few renewable resource options available to displace heating fuels, such as natural gas.

However, there are challenges to a Minnesota-based solar testing laboratory. ASHRAE 93, the standard for testing the efficiency of solar collectors, prescribes a set of strict environmental conditions for testing and characterizing collector performance. There are 22 tests, each requiring a minimum of 20 minutes of collector exposure times at a minimum solar intensity to characterize a collector's thermal performance. Testing laboratories in many climates would have difficulty meeting these thresholds for outdoor testing on a consistent basis throughout the year, thereby lengthening the testing time and shortening the outdoor testing season.¹⁴ We expect that a laboratory in Minnesota may be able to complete outdoor performance testing under natural solar irradiation five to seven months a year. For year round performance testing of solar collectors, a solar simulator would be necessary in Minnesota.

A solar simulator is an expensive and unique piece of equipment ranging in price from \$200,000 to \$1 million. The simulator could complete performance testing on one to four collectors simultaneously per week depending on the simulator and staffing. Durability tests take a month at minimum depending on weather and are also subject to solar irradiation constraints.

A. Costs associated with SRCC accreditation

At this time, there are no guidelines for laboratories wishing to pursue SRCC accreditation.¹⁵ Acquiring accreditation involves planning, design and possibly construction of the laboratory facilities, plus fitting the lab with a complete set of measurement equipment and testing systems. In addition, an outdoor testing area may be designed and equipped to allow collectors to be tested outdoors as well as indoors. Ideally, multiple collectors could be tested at once.

Test facilities will differ, depending on the type of solar collectors to be tested (i.e. solar hot air, glazed flat plate, or unglazed collectors). To set up a solar testing facility requires significant initial investment plus operational costs for maintenance, staffing and calibration of the equipment. It is difficult to identify the cost of such an endeavor. The two laboratories that are SRCC accredited today have developed their facilities incrementally over decades rather than months, so they do not provide a comprehensive model for a start up lab.

An important component of SRCC accreditation of a solar testing laboratory is ISO Standard 17025 compliance. ISO 17025 provides technical specifications for the operation of laboratories to ensure that materials products, processes, and services are appropriate for the lab's intended purpose. For example, an ISO lab must have procedures in place that cover document control, purchasing, customer complaints, corrective actions, record keeping, internal audits, training, sampling, and appropriate handling of test equipment among other criteria.¹⁶

¹⁴ Rojas, D, et al. Thermal performance testing of flat-plate collectors. Solar Energy Laboratory, University of Wisconsin, Madison, WI; 3 March 2008.

¹⁵ Florida Solar Energy Center may be willing to give tours of its testing facility to candidates interested in SRCC accreditation.

¹⁶ SHOQ Quality Assurance Manuals, Inc. www.17025.com. January 11, 2009.

An SRCC applicant must include evidence of ISO Standard 17025 accreditation as part of the application to SRCC. The time required to set up ISO 17025 compliant policies and procedures and to pass inspection by an authorized ISO accreditation authority may be significant. The amount of time was estimated at two years by one of the respondents to the RFI¹⁷ and categorized as “significant” in the Hunt Utilities Group proposal.

B. Estimated startup costs for a Minnesota-based SRCC accredited testing laboratory¹

Land and facility purchase/construction ²		\$ 200,000-500,000
Office Equipment		\$ 5,000
Testing Instrumentation		\$ 20,400
Data monitoring equipment	\$ 4,000	
Pressure sensors	\$ 1,000	
Temperature sensors	\$ 1,000	
Flow meters	\$ 5,000	
Pyranometer	\$ 3,000	
Pyroheliometer	\$ 3,000	
Anemometer	\$ 150	
Psychrometer	\$ 250	
Floor scale	\$ 1,000	
Miscellaneous	\$ 2,000	
Testing Equipment		\$ 220,000 - \$ 1.1 million
Solar simulator ³	\$ 200,000-\$1 million	
Cross-flow fans	\$ 300	
2-axis tracker (outdoor testing)	\$ unknown	
Cold sky simulator	\$ unknown	
Calibration equipment	\$ unknown	
Misc. (pumps, thermostats, etc)	\$ 20,000	
ISO Laboratory Accreditation ³		\$ 30,400
Accreditation authority services	\$ 15,000	
ISO Registrar	\$ 15,000	
<i>ISO 17025 Quality Manual</i>	\$ 400	
SRCC application and inspection fee		\$ 6,000
Application fee		\$ 2,000
Initial site inspection		\$ 3,000 + travel
Additional site inspection fee ⁴		\$ 3,000 + travel
Total start up costs		\$ 482,000-1.6 million

Notes:

1. Compiled from a combination of responses to the RFI, SRCC, interviews with currently accredited SRCC labs, and journal articles.

2. Dependent on location. Hunt Utilities Group states in their response: “A 15,000 square foot facility is sufficient. The building would require a high bay area for solar simulator and related framework.” Alternatively, laboratory space could be leased or financed.

3. Estimates varied widely for a solar simulator and chamber, so a range is included here based on responses to the RFI and an interview with an SRCC accredited laboratory.

4. If re-inspection is required, there is an additional \$3,000 fee plus travel.

¹⁷ Mike Reese, University of Minnesota, Morris (personal communication January 4, 2009).

Estimated Annual Revenues

Testing fees¹⁸ **\$ 240,000 – 360,000**

Note: Assume testing 20 to 30 collectors per year at \$12,000 per collector.

Estimated Annual Expenses¹

Building Lease ²	\$ 45 - 75,000
Insurance, Taxes, Maintenance ³	\$ 42 - 86,000
Salaries	\$ 169 - 219,000
Engineer	\$ 60 - 75,000
Administrative Assistant	\$ 30 - 40,000
Laboratory Technician	\$ 30 - 40,000
Laborer	\$ 15 - 20,000
Employee Benefits	\$ 34 - 44,000
Utility services	\$ unknown
Equipment Maintenance and Instrument Calibrations	\$ unknown
SRCC Accreditation Maintenance Fee	\$ 500
ISO 17025 annual audit	\$ 2,500
Total	\$ 271 - 395,000

Notes:

1. Compiled from a combination of responses to the RFI and the SRCC website. Salaries are labor market dependent.
2. If leasing, subtract cost of facility purchase under Estimated Startup Costs. Leasing prices vary from \$3 to \$5 per square foot.
3. Insurance, taxes, and general maintenance vary from \$2.75 to \$5.75 per square foot.
4. Utilities, Equipment Maintenance and Instrument Calibrations are unknowns. It is difficult to estimate what the power consumption of the solar simulator would be. OES received two estimates for the simulator lamps power requirements: 5,000 watts and 200,000 watts. Bodycote estimates that their simulator is out of service for maintenance approximately two weeks annually, but it is unknown how much of the maintenance is done by staff and how much is sub-contracted. Costs of instrumentation calibration are also not well known.

OES continues to research the costs of establishing an SRCC accredited testing laboratory in Minnesota and may report to the legislature with a revised cost analysis if additional information becomes available.

SRCC’s technical director suggested during the solar thermal stakeholder meeting hosted by OES August 6, 2008, that a solar testing laboratory would likely not be self sustaining. The above estimates of cost suggest this as well. While the U.S. Department of Energy (DOE) subsidizes SRCC’s operations, it cannot be assumed that DOE would subsidize new SRCC testing laboratories. Alternatives for sustaining a Minnesota-based testing lab may include a for-profit, non profit or academic institution:¹⁹

¹⁸ SRCC accredited laboratories set their own prices for testing collectors. Currently Bodycote’s fee is \$10,000 and FSEC’s fee is \$3,000. Manufacturers have indicated a willingness to pay more if there were a reasonable timeframe for testing completion.

¹⁹ With input from McLean, Robert, Q. Swanson, K. Hoefs. Hunt Utilities Group, LLC. Plans and Cost Estimates to Develop a Minnesota-Based Solar Rating and Certification Laboratory and University of Minnesota, Morris.

In our recommendations we discuss the potential for development of a solar testing facility at University of Minnesota, Morris, as part of a larger energy testing center.

C. Responses to Request for Information

OES received two responses to the Request for Information issued September 15, 2008. (See Appendix II.) Responses came from Hunt Utilities Group, LLC and University of Minnesota, Morris.

University of Minnesota, Morris (UMM) has a goal of being a carbon neutral campus by the year 2010. To that end, UMM has invested in a 1.65 Megawatt wind turbine with an additional turbine in the planning stages, renewable hydrogen, and biomass gasification.²⁰ The wind turbine is located at the University of Minnesota's West Central Research and Outreach Center, near campus.

UMM has submitted a formal grant proposal to the Institute on Renewable Energy and the Environment (IREE) for funding to become an SRCC accredited solar thermal testing site. More broadly, the campus would like to become a regional test bed for small wind turbines, various building technologies, and ground source heat pumps .

The concept of a small wind testing facility is timely as the Small Wind Certification Council (SWCC) recently announced plans to approve the pending Small Wind Turbine Performance and Safety Standard by mid-2009. While there are between five and ten small wind testing sites in the United States, there has been no accrediting body until now. The SWCC standard is in response to a recognized need for consistent, independent performance testing of small wind turbines since manufacturers test and rate their turbines differently, a need that UMM recognizes as well.²¹

According to a survey conducted by SWCC, the forty eight small wind manufacturing companies that responded currently sell 110 turbine models. In addition, they are developing 106 new models for sale in the future. Manufacturers expect to certify about half of the models for the North American market. Testing a turbine takes six months to a year. Successful applicants will maintain SWCC certification for five years before needing to be recertified.²² This policy, along with new federal tax incentives for small wind through 2016, will help SWCC-accredited testing facilities secure a predictable and steady stream of product testing.

²⁰ Mike Reese, University of Minnesota, Morris. (personal communication, January 7, 2009).

²¹ Pulaski, Jane. Small Wind Certification Council: Getting Small Wind Turbines Ready for Prime Time. Interstate Renewable Energy Council. December 30, 2008.

²² Pulaski, Jane. Small Wind Certification Council: Getting Small Wind Turbines Ready for Prime Time. Interstate Renewable Energy Council. December 30, 2008.

IV. RECOMMENDATIONS

The Solar Rating and Certification Corporation OG-100 standard should serve as the basis for a Minnesota-based solar rating and certification laboratory.

Plans for a solar rating and certification laboratory in Minnesota should adopt SRCC test procedures and standards to assess durability and cold climate performance. For SRCC certification and testing, a standard for indoor air quality should be established for solar thermal technologies involving air exchanged directly between solar hot air collectors and indoor air.

To minimize start up costs for hardware and the required investment capital and to distribute operational costs among various purposes, the Office of Energy Security recommends that solar thermal testing be just one part of a solar laboratory's services.

Given the limited number of collectors an SRCC accredited lab can test simultaneously, an SRCC accredited laboratory should also function as a hub for a number of complementary purposes, including:

- 1) A testing and certification laboratory of renewable energy equipment;
- 2) A center for energy efficiency (EE) and renewable energy (RE) evaluation to identify the highest and best use of various EE and RE technologies; and

OES recognizes not only a need for additional solar thermal testing by accredited labs, but also a larger need for a technical center of expertise to provide performance characteristics of various energy and building technologies.

Such a center would provide a means of measurement and verification of the carbon reduction strategies that the state will undertake in the coming decades. Additionally, such a center could further serve the state by providing training and consulting. This comprehensive approach would stimulate innovation, improve product safety and performance, and characterize the quality of energy products as defined by industry standards such as the SRCC and the pending SWCC.

Indeed, one of the two SRCC accredited solar testing laboratories, Bodycote Materials Testing, also tests building products and other renewable energy equipment including:²³

- HVAC performance evaluations
- Photovoltaic testing
- Solar thermal test facility
- Wind load simulations for buildings
- Wall and air barrier systems
- Water heating efficiency
- Heat recovery ventilators-certification testing

Given the state's recently adopted energy mandates and goals, it is important that Minnesota has a means to verify energy savings. A solar rating laboratory combined with other energy services is an opportunity to put Minnesota in the forefront of energy measurement services regionally. Establishing such an energy center in Minnesota would contribute to the creation of jobs and help ensure that utility conservation improvement program funds are sensibly invested with results that meet the state's aggressive energy goals.

²³ Bodycote Testing Group. Building Performance Centre. February 2007.

V. REFERENCES

- Bodycote Testing Group. Building Performance Centre. February 2007. <http://mt.bodycote.com/>
- Database of State Incentives for Renewables and Efficiency. www.dsireusa.org
- International Organization for Standardization <http://www.iso.org/iso/home.htm>
- McLean, Robert, Q. Swanson, K. Hoefs. Hunt Utilities Group, LLC. Plans and Cost Estimates to Develop a Minnesota-Based Solar Rating and Certification Laboratory. November 14, 2008.
- Pulaski, Jane. Small Wind Certification Council: Getting Small Wind Turbines Ready for Prime Time. Interstate Renewable Energy Council. December 30, 2008.
- Rojas, D, et al. Thermal performance testing of flat-plate collectors. Solar Energy Laboratory, University of Wisconsin, Madison. March 3, 2008.
- SHOQ Quality Assurance Manuals, Inc. January 11, 2009. www.17025.com
- Solar Rating and Certification Corporation. <http://www.solar-rating.org/laboratories/laboratory.htm>
- Solar Rating and Certification Corporation OG100 Application Package for Solar Collector Certification Program. November 2007.
- Solar Rating & Certification Corporation Accreditation Policy for Testing Programs Evaluating Solar Components, Subsystems, and Systems. Solar Rating and Certification Corporation. November 19, 2008. <http://www.solar-rating.org/laboratories/Lab%20Policy%20Document.pdf>
- University of Minnesota, Morris. Winds of Change Wind turbine at West Central Research and Outreach Center: a national model for renewable energy. <http://www.morris.umn.edu/greencampus/> April 2005.

Appendices

- I. Summary of Findings from the August 6, 2008 Solar Thermal Technical Stakeholder Meeting hosted by Minnesota Office of Energy Security
- II. Office of Energy Security Request for Information for a Plan, Specifications, and Cost Detail for the Development of a Minnesota-Based Solar Rating and Certification Laboratory (issued September 15, 2008)
- III. Solar Rating & Certification Corporation Accreditation Policy for Testing Programs Evaluating Solar Components, Subsystems, and Systems

DATE: August 25, 2008

TO: Jane Davidson, John Dunlop, Jim Huggins, Scott Johnson, Shannon Snell, Sarah Hayden, Mike LeBeau

FROM: Stacy Miller, Office of Energy Security

SUBJECT: Summary of Findings from the August 6, 2008 Solar Thermal Technical Stakeholder Meeting

During the 2008 legislative session, the Minnesota State Legislature directed OES to convene stakeholders with technical knowledge of solar energy system design, manufacturing, operation and installation to develop criteria for a Minnesota-based solar rating and certification laboratory. (*Minn Laws 2008 Chapter 296 Section 27*) A group of six technical stakeholders convened on August 6, 2008, and the meeting was facilitated by OES staff. The results of this stakeholder meeting will be used in the development of the RFP for a Minnesota based solar rating and certification laboratory. The director must report to the legislature with a summary of responses received for this RFP by January 15, 2009.

The technical stakeholder group findings were as follows:

- **SRCC offers a valuable service for consumers, installers, and governments nationwide, but there are some issues.** SRCC's certification program and rating methodologies require various tests on solar collectors by independent laboratories accredited by SRCC. The test results and product data are then evaluated by SRCC to determine the product's compliance with the minimum standards for certification and to calculate the performance ratings. While the SRCC has been the mainstay of the solar thermal industry quality control for more than two decades, there are some shortcomings.
- The group identified a number of opportunities to improve and expand on the SRCC program:
 - **Reduce the time to complete testing for SRCC certification.** Testing to the SRCC standards may take several months to complete at accredited testing facilities. This results in lost revenue for companies who rely on certification in order to secure federal tax incentives for their customers. The lead time has become longer in recent months due to the demand on those facilities. On the other hand, other testing facilities are reluctant to make the investment necessary to develop the capability to test equipment for SRCC certification unless a significant extension of the current federal investment tax credit, currently due to expire at the end of 2008, is enacted.
 - **Add standards and testing to better predict long-term durability.** Durability testing in the current SRCC program is limited to stagnation testing to ensure collectors maintain fluid flow system integrity under

extreme, short term, temperature conditions and thermal shock conditions. The program does not require testing materials for possible long term degradation. However, long term durability testing may be difficult in light of the desire to shorten the testing period as reflected in the point above.

- **Improve cold climate performance evaluation.** A concern was raised whether the testing that is conducted outdoors in Florida and indoors in the simulator in Ontario, Canada, is adequate to characterize the performance of solar collectors in Minnesota. Further discussion revealed that the performance indices generated in the procedures used by SRCC do accurately predict the performance characteristics under cold temperature conditions such as those experienced in Minnesota's climates.
- **Add standards and test procedures to determine if any effluent from solar air collectors may jeopardize indoor air quality.** Concerns were raised related to the use of materials and components in solar hot air collectors that may break down over time or under stagnation conditions. Such degradation may present an indoor air quality hazard. Absorber plate materials and coatings are of particular concern. The group agreed that this is an issue that should be addressed.

To summarize, the Solar Rating and Certification Corporation OG-100 standard should serve as the basis for a Minnesota-based solar rating and certification laboratory. Plans for a solar rating and certification laboratory in Minnesota should incorporate SRCC test procedures and standards to assess durability and cold climate performance. In addition, plans should include a proposed standard for indoor air quality in cases where air will be exchanged directly between solar hot air collectors and indoor air.



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**Solar Rating & Certification Corporation
Accreditation Policy For Testing Programs Evaluating
Solar Components, Subsystems, and Systems**

SRCC Laboratory Testing Program Accreditation Policy

1.0 Policy Purpose.

- 1.1 This document sets forth the Solar Rating and Certification Corporation (SRCC) Laboratory Testing Program Accreditation Policy (the Policy). SRCC certifies solar collectors based on: appropriate standards; and, testing information received from laboratories operating SRCC Accredited Testing Programs, and with the cooperation of solar product manufacturers and suppliers.
- 1.2 SRCC certifies complete solar energy systems based on safety, design, and performance criteria, as set forth in this Policy, including Section 7.0 Test Methods.
- 1.3 The provider of the solar component to be tested provides physical product and product information to the testing laboratory. Upon completion of laboratory testing according to the criteria set forth in this Policy, and any other requirements identified by the Laboratory Testing Program Accreditation Committee (Accreditation Committee), the laboratory shall transmit completed documentation directly to SRCC for product review and certification.
- 1.4 SRCC does not provide product or laboratory testing services.
- 1.5 This Policy is intended to:
 - 1.5.1 Implement appropriate review and accreditation requirements for laboratory testing of certain solar equipment;
 - 1.5.2 Adopt appropriate standards for such accreditations; and,
 - 1.5.3 Establish an appropriate accreditation system for laboratory evaluation and testing of solar equipment.

2.0 Policy Scope.

- 2.1 The criteria, requirements, and procedures contained in this Policy serve as the primary means for evaluating an applicant's Laboratory Testing Program to assure, at a minimum, the laboratory's ability to conduct specific tests of solar products in accordance with SRCC certification requirements, as set forth in Policy Section 7.0 Test Methods and other SRCC policies. Among other conditions of SRCC accreditation, each applicant laboratory must adhere to the following requirements:
 - 2.1.1 All product evaluation and testing shall be conducted in a technically competent and professional manner;

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- 2.1.2 All product evaluation and testing shall be free from influence or conflicts of interest that could affect the laboratory's objectivity or ability to provide unbiased test results; and,
- 2.1.3 All product evaluation and testing shall be in compliance with the requirements and procedures of the test methods authorized by this Policy and accepted scientific practice.
- 2.1.4 All product evaluation and test reports shall be transmitted directly to SRCC for evaluation. No product evaluation or test reports will be accepted unless transmitted directly from the laboratory or testing facility which conducted the tests or evaluation of the product for which SRCC certification is sought.
- 2.2 SRCC certifies solar equipment of various types, which are tested under several different protocols, as identified in Policy Section 7.0 Test Methods and other SRCC policies.
- 2.3 A laboratory may apply for accreditation of one (1) or more specific Testing Programs to conduct solar equipment evaluations according to the applicable Test Method, or any combination of Test Methods, so long as all Test Methods are identified and accredited pursuant to the laboratory's ISO/IEC Standard 17025 accreditation. Accreditation is granted based on the laboratory's ability to conduct one (1) or more of the Test Methods identified in Section 7.2 of this Policy.
- 2.4 Any laboratory, regardless of its geographic location, may apply for SRCC accreditation of its Testing Program, so long as it meets the requirements of this Policy.
- 2.5 The applicant laboratory must demonstrate, and provide evidence, that it has been accredited under ISO/IEC Standard 17025 by an authorized ISO accreditation authority.

The SRCC Laboratory Testing Program Accreditation Committee may consider other factors relevant to laboratory accreditation when reviewing an application, including, but not limited to, the following: geographic location; weather conditions; facility conditions; and, personnel availability at the laboratory location. SRCC may, at its sole discretion, choose to limit, place conditions on, or deny SRCC accreditation for a laboratory's Testing Program.

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3.0 Policy Definitions.

- 3.1 Accreditation: Formal evaluation and notification by the SRCC that a Testing Program operated by a laboratory has met the criteria and standards set forth in this Policy to perform the specific tests identified in the SRCC accreditation for the purpose of providing test data to support requests for solar equipment certification.
- 3.2 Accredited Testing Program: A Laboratory Testing Program that has been granted SRCC accreditation.
- 3.3 Product Certification: A formal, written notice issued by SRCC, representing that the identified Solar Collector, Solar System, or other solar product has been certified to be in compliance with all applicable SRCC certification standards and specifications. SRCC certification includes the determination that the required product testing information was obtained from a laboratory operating an SRCC Accredited Testing Program, pursuant to this Policy.
- 3.4 Accreditation Committee: The Laboratory Testing Program Accreditation Committee of the Solar Rating and Certification Corporation. This Committee is an SRCC Standing Committee, whose members are appointed by the SRCC Chair, and which has the responsibility of evaluating laboratory testing program accreditation applications, granting testing program accreditation, and determining the disposition of Laboratory Testing Program Accreditation matters.
- 3.5 Laboratory: An organization or part of an organization engaged in the activities of solar equipment testing and/or inspection, and accredited under ISO/IEC Standard 17025.
- 3.6 Quality: The totality of features and characteristics of a product or service which bear on its ability to satisfy a given need.
- 3.7 Test: The measurement of physical, chemical, or functional characteristics of materials, systems, or components under a predetermined set of conditions, to a specific standard and/or procedure as specified by SRCC.
- 3.8 ISO/IEC Standard 17025: International Organization for Standardization (ISO) Standard 17025 establishes appropriate operational criteria for testing laboratories. The Standard is intended to implement a quality system for improving a laboratory's ability to consistently produce valid results, and serves as the basis for ISO accreditation by an authorized ISO accrediting body. Like other ISO Standards, Standard 17025 provides technical specifications and other specific criteria for the operation of laboratories, in order to ensure that materials, products, processes, and services are fit for the intended purpose.

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- 3.9 IEC: The International Electrotechnical Commission (IEC) is the primary global organization responsible for the preparation and publication of international standards for electrical, electronic, and related technologies. IEC Standards serve as a basis for national standardization, and as important industry references.

4.0 SRCC Laboratory Testing Program Accreditation.

- 4.1 In addition to other Policy requirements, a laboratory testing program must satisfy the following conditions of SRCC accreditation:
- 4.1.1 Laboratory Accreditation to the most current version of ISO/IEC Standard 17025; “*General requirements for the competence of testing and calibration laboratories*,” by an entity recognized as an ISO/IEC accrediting organization in the laboratory’s sphere of influence where testing services are offered to SRCC certification applicants. Such ISO accrediting organization must be authorized to conduct accreditation audits by the applicable country’s ISO representative organization.
 - 4.1.2 Appropriate documentation evidencing that the laboratory’s current Scope(s) of Accreditation to ISO/IEC Standard 17025 include the tests for which the laboratory seeks SRCC accreditation.
 - 4.1.3 Complete and accurate Accreditation Application information and materials;
 - 4.1.4 All other documentation required in, or related to, the Accreditation Application;
 - 4.1.5 All applicable Accreditation Application fees and other charges;
 - 4.1.6 Satisfaction of all SRCC Laboratory Testing Program criteria as determined by SRCC; and,
 - 4.1.7 Completion and submission of all SRCC Testing Program Accreditation documentation as required by this Policy or the SRCC Accreditation Committee.

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5.0 Application for Accreditation.

- 5.1 A laboratory seeking Testing Program Accreditation must submit a complete SRCC Laboratory Testing Program Accreditation Application to the Accreditation Committee, and satisfy all requirements of SRCC policies. An application for accreditation is provided on the SRCC Internet site, located at www.solar-rating.org.
- 5.2 Among other information, a complete Accreditation Application must include the following:
 - 5.2.1 A valid and current copy of the laboratory's ISO/IEC Standard 17025 accreditation documentation; and,
 - 5.2.2 The accurate identification of the individual tests for which the laboratory is seeking SRCC accreditation.
- 5.3 Upon receipt of an Accreditation Application, SRCC shall perform a preliminary review of the Application and notify the applicant of any identified or potential deficiencies. SRCC reserves the sole and exclusive right and discretion to determine whether an applicant has satisfied the applicable standards and requirements necessary for SRCC Laboratory Testing Program Accreditation.
- 5.4 A laboratory may reapply for testing program accreditation where: an Accreditation Application has been rejected or denied; or, and Application has been withdrawn.

6.0 Fees and Charges.

- 6.1 The SRCC Board of Directors shall establish and regulate all fees and charges related to the Laboratory Testing Accreditation Program, which may be modified from time to time as appropriate.
- 6.2 In order to be processed and reviewed, an Accreditation Application must be accompanied by the complete payment of all application fees and related SRCC charges, as set forth in the SRCC Testing Laboratory Program Accreditation Application.
- 6.3 Accreditation Application fees and charges are not refundable to the applicant laboratory.

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7.0 Test Methods For Which Accreditation May Be Granted.

- 7.1 The SRCC Board of Directors, in consultation with the Laboratory Testing Program Accreditation Committee, shall determine and identify each Test Method for which SRCC will grant Testing Program accreditation. In its sole discretion, the SRCC Board may add or remove Accredited Test Methods.
- 7.2 The following Test Methods are eligible for Laboratory Testing Program Accreditation.
- 7.2.1 ISO Standard 9806-1: “Test methods for solar collectors – Part 1: Thermal performance of glazed liquid heating collectors including pressure drop.”
- 7.2.2 ISO Standard 9806-2: “Test methods for solar collectors – Part 2: Qualification test procedures.”
- 7.2.3 ISO Standard 9806-3: “Thermal performance of unglazed liquid heating collectors (sensible heat transfer only) including pressure drop.”
- 7.2.4 ASHRAE Standard 93: “Methods of testing to determine the thermal performance of solar collectors,” only as it applies to air-heating collectors.
- 7.2.5 SRCC TM-1 Standard: “SDHW system and component test procedures.”
- 7.3 A SRCC Accredited Laboratory Testing Program shall conduct tests in accordance with one (1) or more Test Methods identified in Section 7.2. Accredited Laboratory Testing Program Reports shall not be accepted by SRCC unless the Test Method protocols set forth in the Laboratory’s SRCC Testing Program Accreditation Application are followed in their entirety.

8.0 Accreditation Conditions and Maintenance.

- 8.1 Evidence of Accreditation: SRCC Accreditation of a Laboratory Testing Program shall be evidenced by a letter or certificate of accreditation from the Accreditation Committee, which shall be posted in the laboratory.
- 8.2 ISO Accreditation Maintenance: SRCC Laboratory Testing Program Accreditation shall terminate in the event that the laboratory’s ISO/IEC Standard 17025 accreditation expires or is otherwise terminated.
- 8.3 Compliance with Legal Requirements: A laboratory providing accredited SRCC Testing Program services shall satisfy all local, state, and federal legal

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requirements pertaining to the operation and administration of such services and other laboratory activities.

- 8.4 Period of Accreditation/Fees: An SRCC Testing Program Accreditation shall remain in force as long as the laboratory complies with the conditions of this Policy, and remits all annual accreditation and any site inspection fees and charges.
- 8.5 Inspection of Laboratories: In order to assure initial compliance with the conditions of Testing Program Accreditation, SRCC will conduct a laboratory site inspection. In order to assure continued compliance with the requirements for accreditation, a laboratory providing SRCC accredited testing programs shall grant the Accreditation Committee, or its authorized representative, the right to conduct subsequent inspections of the laboratory and record-keeping facilities, subject to the provisions of this Section. The laboratory shall cooperate with any SRCC inspection in all aspects.
- 8.5.1 SRCC shall provide a four (4) calendar day minimum notice of inspection to the laboratory holding the Testing Program Accreditation.
- 8.5.2 During an inspection, a laboratory providing SRCC accredited testing program services shall make available all records as described in the notice of inspection, including, but not limited to:
- 8.5.2.1 Equipment calibration records;
 - 8.5.2.2 Solar collector efficiency test records; and,
 - 8.5.2.3 Personnel records regarding responsibility for tests.
- 8.5.3 During an inspection, the laboratory shall be represented by the Laboratory Director or Testing Laboratory Supervisor.
- 8.5.4 During the inspection, the laboratory shall make available individual testing personnel, as requested by the SRCC.
- 8.6 Use of Authorized SRCC Marks: An authorized SRCC mark and/or logo may be used by a laboratory conducting an SRCC Accredited Testing Program, as long as all current accreditation fees and charges owed by the laboratory have been paid when due, and the Laboratory Testing Program Accreditation by SRCC has not been revoked, suspended or terminated by SRCC, and all terms of this Policy are met.
- 8.7 Termination or Suspension of Accreditation: In the event that a laboratory fails to satisfy the accreditation requirements of this Policy, or other SRCC policies, the accreditation of the Laboratory Testing Program may be terminated, revoked, or suspended at the sole discretion of SRCC.

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9.0 Renewal of Accreditation.

- 9.1 Accreditation renewal may be granted by the Accreditation Committee if the applicant continues to satisfy all of the requirements and conditions of accreditation set forth in this Policy, and otherwise directed by SRCC. Among other conditions of accreditation renewal:
 - 9.1.1 The laboratory must submit to the Accreditation Committee evidence of renewal of its accreditation to ISO/IEC Standard 17025 within thirty (30) calendar days of expiration of such ISO accreditation.
 - 9.1.2 The laboratory must comply with all SRCC policies and procedures regarding Accredited Testing Programs;
 - 9.1.3 The laboratory must make payment of Laboratory Accredited Testing Program fees and charges when due, as billed by SRCC, and;
 - 9.1.4 The laboratory must demonstrate compliance with any other specific requirements set forth in the letter or certificate of accreditation, or otherwise directed by SRCC.
- 9.2 In order to be eligible for Testing Program Accreditation renewal, a laboratory must provide to SRCC all requested verifications of compliance with any legal or organizational requirement which may affect the laboratory's ability to safely and legally continue business operations.

10.0 Voluntary Termination of Testing Program Accreditation.

- 10.1 A testing laboratory may voluntarily terminate an SRCC Testing Program Accreditation by providing written notice of its intent to the Accreditation Committee. The notice shall state the effective termination date and the reasons for the termination.
- 10.2 Any SRCC Testing Program fees and charges paid by a laboratory are non-refundable in the event of a voluntary termination of SRCC accreditation.

11.0 Accredited Testing Program Deficiencies, Violations, and Sanctions.

- 11.1 Notice of Deficiency and Resolution Process: In the event that a laboratory operating an Accredited Testing Program violates, or otherwise does not comply with, the provisions of this Policy or other SRCC requirements, the Accreditation Committee shall issue a Notice of Deficiency and Violation (Notice) to the laboratory. Upon receipt of such Notice, the laboratory shall: respond to each

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identified deficiency and/or violation; provide all relevant information and materials; and, otherwise satisfy all requirements set forth in the Notice. Following the timely submission of such response to the Notice, all deficiency and violation matters shall be resolved pursuant to the SRCC Certification and Accreditation Appeal Policy (Appeal Policy) and this Policy Section.

- 11.2 Failure to Respond: In the event that the laboratory does not provide a timely and complete response to a Notice, the Accreditation Committee may issue any sanction(s) or corrective action(s) authorized by this Policy, the Grievance Policy, or other applicable SRCC Policy. The laboratory shall comply fully with all sanctions and/or corrective actions issued by the Committee.
- 11.3 Grounds for Sanction and Corrective Actions: Among other grounds, the Accreditation Committee may issue accreditation sanctions and/or corrective actions under the following circumstances:
- 11.3.1 An Accreditation Application contains a material misrepresentation;
 - 11.3.2 A laboratory makes a public misrepresentation concerning its activities, operations, or a tested product;
 - 11.3.3 A laboratory fails to comply with a condition of the accreditation;
 - 11.3.4 A laboratory violates an SRCC Policy;
 - 11.3.5 A laboratory fails to remit required accreditation fees and charges to SRCC consistent with the terms; or,
 - 11.3.6 Where other good and reasonable cause exists and supports the issuance of sanctions or corrective actions.
- 11.4 Deficiency and Violation Decision: Based on the information available, the Accreditation Committee, in its sole discretion, shall determine whether a deficiency or violation exists, or dismiss the Notice. Upon the finding of any deficiency or violation, the Accreditation Committee shall review the record, determine the severity of such deficiency(ies) or violation(s), and issue a Deficiency/Violation Decision. In its sole and exclusive discretion, the Committee may issue one or more of the following actions:
- 11.4.1 Private or Public Reprimand.
 - 11.4.2 Conditions of Continued Accreditation.
 - 11.4.3 Accreditation Probation. The term of a probationary period shall be in one (1) month increments through an initial six (6) months. The Committee

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may determine the duration of the Probationary Period within this six (6) month time frame.

11.4.4 Accreditation Suspension. The term of a suspension shall be in six (6) month increments, as determined by the Committee.

11.4.5 Accreditation Revocation. After revocation of accreditation by SRCC, a laboratory may apply for accreditation after two (2) years following the date of the revocation.

12.0 Deficiency and Violation Decision Appeals.

A laboratory may appeal an adverse Deficiency Violation Decision, or any part thereof, to the SRCC Appeals Committee, pursuant to the terms of SRCC Appeal Policy.

13.0 Reinstatement and Reapplication Procedures Following Probation, Suspension, and Revocation.

13.1 Probation/Reinstatement: Following the expiration of a final probation decision issued under this Policy, the Accreditation Committee shall determine whether the laboratory has satisfied the terms of the probation, including any related conditions. If the laboratory has satisfied the terms of probation in full, the Committee shall verify that the probation has been completed and reinstate the laboratory to active accreditation status. If the laboratory has not satisfied the terms of probation in full, the Committee shall notify the laboratory of the failure to satisfy the terms of probation and may take the following actions: continuation of the probation; and/or, issuance of additional disciplinary or remedial actions concerning the probation terms.

13.2 Suspension/Reinstatement: Following the expiration of a final suspension decision issued under this Policy, the Accreditation Committee shall determine whether the laboratory has satisfied the terms of the suspension, including any related conditions. If the laboratory has satisfied the terms of the suspension in full, the Committee shall verify that the suspension has been completed and reinstate the laboratory to active accreditation status. If the laboratory has not satisfied the terms of the suspension in full, the Committee shall notify the laboratory of the failure to satisfy the terms of the suspension and may take the following actions: continuation of the suspension; and/or, issuance of additional disciplinary or remedial actions concerning the suspension terms.

13.3 Revocation/Reapplication: Two (2) years after the issuance of a final termination issued under this Policy, the laboratory may submit to the Accreditation Committee a Request for Permission to Reapply for Accreditation status (Reapplication Request). Subject to the time restriction above, the Committee

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shall consider a Reapplication Request from a laboratory whose status has been terminated. Reapplication Requests must include the following information: (a) The date that the final Deficiency Violation Decision was issued; (b) A statement of the reasons that the laboratory believes support or justify the acceptance of the Reapplication Request, including a statement explaining why the laboratory should now receive accreditation status and why the compliance action no longer applies to the laboratory; and, (c) Copies of any relevant documents or other materials upon which the laboratory relies in support of the Reapplication Request. Within ninety (90) days after the submission of a complete Reapplication Request, or as soon after as practical, the Accreditation Committee shall review the information presented by the laboratory and any other relevant information. The Committee shall then determine the final outcome of the Reapplication Request by majority vote in closed session.

- 13.4 Accreditation Committee Reapplication Request Decisions: Following the Accreditation Committee's review of a Reapplication Request, or as soon as practical, the Committee, by the Committee Chair, shall transmit its decision with respect to the Reapplication Request. The final Committee decision shall indicate whether the Request is granted, denied, or continued to a later date. If appropriate, the decision may include any Program participation conditions that the Committee has required. Copies of the Accreditation Committee decision shall be sent to the parties, via U.S. mail, return receipt requested, or other appropriate delivery method. While no appeal of the Committee decision is permitted, the laboratory may submit a new Reapplication Request pursuant to this Section, one (1) year or more after the issuance of a Committee decision denying a Reapplication Request.

14.0 Policy Purpose.

- 14.1 This document sets forth the Solar Rating and Certification Corporation (SRCC) Laboratory Testing Program Accreditation Policy (the Policy). SRCC certifies solar collectors based on: appropriate standards; and, testing information received from laboratories operating SRCC Accredited Testing Programs, and with the cooperation of solar product manufacturers and suppliers.
- 14.2 SRCC certifies complete solar energy systems based on safety, design, and performance criteria, as set forth in this Policy, including Section 7.0 Test Methods.
- 14.3 The provider of the solar component to be tested provides physical product and product information to the testing laboratory. Upon completion of laboratory testing according to the criteria set forth in this Policy, and any other requirements identified by the Laboratory Testing Program Accreditation Committee (Accreditation Committee), the laboratory shall transmit completed documentation directly to SRCC for product review and certification.

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- 14.4 SRCC does not provide product or laboratory testing services.
- 14.5 This Policy is intended to:
 - 14.5.1 Implement appropriate review and accreditation requirements for laboratory testing of certain solar equipment;
 - 14.5.2 Adopt appropriate standards for such accreditations; and,
 - 14.5.3 Establish an appropriate accreditation system for laboratory evaluation and testing of solar equipment.

15.0 Policy Scope.

- 15.1 The criteria, requirements, and procedures contained in this Policy serve as the primary means for evaluating an applicant's Laboratory Testing Program to assure, at a minimum, the laboratory's ability to conduct specific tests of solar products in accordance with SRCC certification requirements, as set forth in Policy Section 7.0 Test Methods and other SRCC policies. Among other conditions of SRCC accreditation, each applicant laboratory must adhere to the following requirements:
 - 15.1.1 All product evaluation and testing shall be conducted in a technically competent and professional manner;
 - 15.1.2 All product evaluation and testing shall be free from influence or conflicts of interest that could affect the laboratory's objectivity or ability to provide unbiased test results; and,
 - 15.1.3 All product evaluation and testing shall be in compliance with the requirements and procedures of the test methods authorized by this Policy and accepted scientific practice.
 - 15.1.4 All product evaluation and test reports shall be transmitted directly to SRCC for evaluation. No product evaluation or test reports will be accepted unless transmitted directly from the laboratory or testing facility which conducted the tests or evaluation of the product for which SRCC certification is sought.
- 15.2 SRCC certifies solar equipment of various types, which are tested under several different protocols, as identified in Policy Section 7.0 Test Methods and other SRCC policies.

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- 15.3 A laboratory may apply for accreditation of one (1) or more specific Testing Programs to conduct solar equipment evaluations according to the applicable Test Method, or any combination of Test Methods, so long as all Test Methods are identified and accredited pursuant to the laboratory's ISO/IEC Standard 17025 accreditation. Accreditation is granted based on the laboratory's ability to conduct one (1) or more of the Test Methods identified in Section 7.2 of this Policy.
- 15.4 Any laboratory, regardless of its geographic location, may apply for SRCC accreditation of its Testing Program, so long as it meets the requirements of this Policy.
- 15.5 The applicant laboratory must demonstrate, and provide evidence, that it has been accredited under ISO/IEC Standard 17025 by an authorized ISO accreditation authority.
- 15.6 The SRCC Laboratory Testing Program Accreditation Committee may consider other factors relevant to laboratory accreditation when reviewing an application, including, but not limited to, the following: geographic location; weather conditions; facility conditions; and, personnel availability at the laboratory location. SRCC may, at its sole discretion, choose to limit, place conditions on, or deny SRCC accreditation for a laboratory's Testing Program.

16.0 Policy Definitions.

- 16.1 Accreditation: Formal evaluation and notification by the SRCC that a Testing Program operated by a laboratory has met the criteria and standards set forth in this Policy to perform the specific tests identified in the SRCC accreditation for the purpose of providing test data to support requests for solar equipment certification.
- 16.2 Accredited Testing Program: A Laboratory Testing Program that has been granted SRCC accreditation.
- 16.3 Product Certification: A formal, written notice issued by SRCC, representing that the identified Solar Collector, Solar System, or other solar product has been certified to be in compliance with all applicable SRCC certification standards and specifications. SRCC certification includes the determination that the required product testing information was obtained from a laboratory operating an SRCC Accredited Testing Program, pursuant to this Policy.
- 16.4 Accreditation Committee: The Laboratory Testing Program Accreditation Committee of the Solar Rating and Certification Corporation. This Committee is an SRCC Standing Committee, whose members are appointed by the SRCC Chair, and which has the responsibility of evaluating laboratory testing program

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accreditation applications, granting testing program accreditation, and determining the disposition of Laboratory Testing Program Accreditation matters.

- 16.5 Laboratory: An organization or part of an organization engaged in the activities of solar equipment testing and/or inspection, and accredited under ISO/IEC Standard 17025.
- 16.6 Quality: The totality of features and characteristics of a product or service which bear on its ability to satisfy a given need.
- 16.7 Test: The measurement of physical, chemical, or functional characteristics of materials, systems, or components under a predetermined set of conditions, to a specific standard and/or procedure as specified by SRCC.
- 16.8 ISO/IEC Standard 17025: International Organization for Standardization (ISO) Standard 17025 establishes appropriate operational criteria for testing laboratories. The Standard is intended to implement a quality system for improving a laboratory's ability to consistently produce valid results, and serves as the basis for ISO accreditation by an authorized ISO accrediting body. Like other ISO Standards, Standard 17025 provides technical specifications and other specific criteria for the operation of laboratories, in order to ensure that materials, products, processes, and services are fit for the intended purpose.
- 16.9 IEC: The International Electrotechnical Commission (IEC) is the primary global organization responsible for the preparation and publication of international standards for electrical, electronic, and related technologies. IEC Standards serve as a basis for national standardization, and as important industry references.

17.0 SRCC Laboratory Testing Program Accreditation.

- 17.1 In addition to other Policy requirements, a laboratory testing program must satisfy the following conditions of SRCC accreditation:
 - 17.1.1 Laboratory Accreditation to the most current version of ISO/IEC Standard 17025; "*General requirements for the competence of testing and calibration laboratories*," by an entity recognized as an ISO/IEC accrediting organization in the laboratory's sphere of influence where testing services are offered to SRCC certification applicants. Such ISO accrediting organization must be authorized to conduct accreditation audits by the applicable country's ISO representative organization.
 - 17.1.2 Appropriate documentation evidencing that the laboratory's current Scope(s) of Accreditation to ISO/IEC Standard 17025 include the tests for which the laboratory seeks SRCC accreditation.

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- 17.1.3 Complete and accurate Accreditation Application information and materials;
- 17.1.4 All other documentation required in, or related to, the Accreditation Application;
- 17.1.5 All applicable Accreditation Application fees and other charges;
- 17.1.6 Satisfaction of all SRCC Laboratory Testing Program criteria as determined by SRCC; and,
- 17.1.7 Completion and submission of all SRCC Testing Program Accreditation documentation as required by this Policy or the SRCC Accreditation Committee.

18.0 Application for Accreditation.

- 18.1 A laboratory seeking Testing Program Accreditation must submit a complete SRCC Laboratory Testing Program Accreditation Application to the Accreditation Committee, and satisfy all requirements of SRCC policies. An application for accreditation is provided on the SRCC Internet site, located at www.solar-rating.org.
- 18.2 Among other information, a complete Accreditation Application must include the following:
 - 18.2.1 A valid and current copy of the laboratory's ISO/IEC Standard 17025 accreditation documentation; and,
 - 18.2.2 The accurate identification of the individual tests for which the laboratory is seeking SRCC accreditation.
- 18.3 Upon receipt of an Accreditation Application, SRCC shall perform a preliminary review of the Application and notify the applicant of any identified or potential deficiencies. SRCC reserves the sole and exclusive right and discretion to determine whether an applicant has satisfied the applicable standards and requirements necessary for SRCC Laboratory Testing Program Accreditation.
- 18.4 A laboratory may reapply for testing program accreditation where: an Accreditation Application has been rejected or denied; or, and Application has been withdrawn.

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19.0 Fees and Charges.

- 19.1 The SRCC Board of Directors shall establish and regulate all fees and charges related to the Laboratory Testing Accreditation Program, which may be modified from time to time as appropriate.
- 19.2 In order to be processed and reviewed, an Accreditation Application must be accompanied by the complete payment of all application fees and related SRCC charges, as set forth in the SRCC Testing Laboratory Program Accreditation Application.
- 19.3 Accreditation Application fees and charges are not refundable to the applicant laboratory.

20.0 Test Methods For Which Accreditation May Be Granted.

- 20.1 The SRCC Board of Directors, in consultation with the Laboratory Testing Program Accreditation Committee, shall determine and identify each Test Method for which SRCC will grant Testing Program accreditation. In its sole discretion, the SRCC Board may add or remove Accredited Test Methods.
- 20.2 The following Test Methods are eligible for Laboratory Testing Program Accreditation.
 - 20.2.1 ISO Standard 9806-1: “Test methods for solar collectors – Part 1: Thermal performance of glazed liquid heating collectors including pressure drop.”
 - 20.2.2 ISO Standard 9806-2: “Test methods for solar collectors – Part 2: Qualification test procedures.”
 - 20.2.3 ISO Standard 9806-3: “Thermal performance of unglazed liquid heating collectors (sensible heat transfer only) including pressure drop.”
 - 20.2.4 ASHRAE Standard 93: “Methods of testing to determine the thermal performance of solar collectors,” only as it applies to air-heating collectors.
 - 20.2.5 SRCC TM-1 Standard: “SDHW system and component test procedures.”
- 20.3 A SRCC Accredited Laboratory Testing Program shall conduct tests in accordance with one (1) or more Test Methods identified in Section 7.2. Accredited Laboratory Testing Program Reports shall not be accepted by SRCC unless the Test Method protocols set forth in the Laboratory’s SRCC Testing Program Accreditation Application are followed in their entirety.

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21.0 Accreditation Conditions and Maintenance.

- 21.1 Evidence of Accreditation: SRCC Accreditation of a Laboratory Testing Program shall be evidenced by a letter or certificate of accreditation from the Accreditation Committee, which shall be posted in the laboratory.
- 21.2 ISO Accreditation Maintenance: SRCC Laboratory Testing Program Accreditation shall terminate in the event that the laboratory's ISO/IEC Standard 17025 accreditation expires or is otherwise terminated.
- 21.3 Compliance with Legal Requirements: A laboratory providing accredited SRCC Testing Program services shall satisfy all local, state, and federal legal requirements pertaining to the operation and administration of such services and other laboratory activities.
- 21.4 Period of Accreditation/Fees: An SRCC Testing Program Accreditation shall remain in force as long as the laboratory complies with the conditions of this Policy, and remits all annual accreditation and any site inspection fees and charges.
- 21.5 Inspection of Laboratories: In order to assure initial compliance with the conditions of Testing Program Accreditation, SRCC will conduct a laboratory site inspection. In order to assure continued compliance with the requirements for accreditation, a laboratory providing SRCC accredited testing programs shall grant the Accreditation Committee, or its authorized representative, the right to conduct subsequent inspections of the laboratory and record-keeping facilities, subject to the provisions of this Section. The laboratory shall cooperate with any SRCC inspection in all aspects.
- 21.5.1 SRCC shall provide a four (4) calendar day minimum notice of inspection to the laboratory holding the Testing Program Accreditation.
- 21.5.2 During an inspection, a laboratory providing SRCC accredited testing program services shall make available all records as described in the notice of inspection, including, but not limited to:
- 21.5.2.1 Equipment calibration records;
 - 21.5.2.2 Solar collector efficiency test records; and,
 - 21.5.2.3 Personnel records regarding responsibility for tests.
- 21.5.3 During an inspection, the laboratory shall be represented by the Laboratory Director or Testing Laboratory Supervisor.

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- 21.5.4 During the inspection, the laboratory shall make available individual testing personnel, as requested by the SRCC.
- 21.6 Use of Authorized SRCC Marks: An authorized SRCC mark and/or logo may be used by a laboratory conducting an SRCC Accredited Testing Program, as long as all current accreditation fees and charges owed by the laboratory have been paid when due, and the Laboratory Testing Program Accreditation by SRCC has not been revoked, suspended or terminated by SRCC, and all terms of this Policy are met.
- 21.7 Termination or Suspension of Accreditation: In the event that a laboratory fails to satisfy the accreditation requirements of this Policy, or other SRCC policies, the accreditation of the Laboratory Testing Program may be terminated, revoked, or suspended at the sole discretion of SRCC.

22.0 Renewal of Accreditation.

- 22.1 Accreditation renewal may be granted by the Accreditation Committee if the applicant continues to satisfy all of the requirements and conditions of accreditation set forth in this Policy, and otherwise directed by SRCC. Among other conditions of accreditation renewal:
- 22.1.1 The laboratory must submit to the Accreditation Committee evidence of renewal of its accreditation to ISO/IEC Standard 17025 within thirty (30) calendar days of expiration of such ISO accreditation.
- 22.1.2 The laboratory must comply with all SRCC policies and procedures regarding Accredited Testing Programs;
- 22.1.3 The laboratory must make payment of Laboratory Accredited Testing Program fees and charges when due, as billed by SRCC, and;
- 22.1.4 The laboratory must demonstrate compliance with any other specific requirements set forth in the letter or certificate of accreditation, or otherwise directed by SRCC.
- 22.2 In order to be eligible for Testing Program Accreditation renewal, a laboratory must provide to SRCC all requested verifications of compliance with any legal or organizational requirement which may affect the laboratory's ability to safely and legally continue business operations.

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23.0 Voluntary Termination of Testing Program Accreditation.

- 23.1 A testing laboratory may voluntarily terminate an SRCC Testing Program Accreditation by providing written notice of its intent to the Accreditation Committee. The notice shall state the effective termination date and the reasons for the termination.
- 23.2 Any SRCC Testing Program fees and charges paid by a laboratory are non-refundable in the event of a voluntary termination of SRCC accreditation.

24.0 Accredited Testing Program Deficiencies, Violations, and Sanctions.

- 24.1 Notice of Deficiency and Resolution Process: In the event that a laboratory operating an Accredited Testing Program violates, or otherwise does not comply with, the provisions of this Policy or other SRCC requirements, the Accreditation Committee shall issue a Notice of Deficiency and Violation (Notice) to the laboratory. Upon receipt of such Notice, the laboratory shall: respond to each identified deficiency and/or violation; provide all relevant information and materials; and, otherwise satisfy all requirements set forth in the Notice. Following the timely submission of such response to the Notice, all deficiency and violation matters shall be resolved pursuant to the SRCC Certification and Accreditation Appeal Policy (Appeal Policy) and this Policy Section.
- 24.2 Failure to Respond: In the event that the laboratory does not provide a timely and complete response to a Notice, the Accreditation Committee may issue any sanction(s) or corrective action(s) authorized by this Policy, the Grievance Policy, or other applicable SRCC Policy. The laboratory shall comply fully with all sanctions and/or corrective actions issued by the Committee.
- 24.3 Grounds for Sanction and Corrective Actions: Among other grounds, the Accreditation Committee may issue accreditation sanctions and/or corrective actions under the following circumstances:
- 24.3.1 An Accreditation Application contains a material misrepresentation;
 - 24.3.2 A laboratory makes a public misrepresentation concerning its activities, operations, or a tested product;
 - 24.3.3 A laboratory fails to comply with a condition of the accreditation;
 - 24.3.4 A laboratory violates an SRCC Policy;
 - 24.3.5 A laboratory fails to remit required accreditation fees and charges to SRCC consistent with the terms; or,

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24.3.6 Where other good and reasonable cause exists and supports the issuance of sanctions or corrective actions.

24.4 Deficiency and Violation Decision: Based on the information available, the Accreditation Committee, in its sole discretion, shall determine whether a deficiency or violation exists, or dismiss the Notice. Upon the finding of any deficiency or violation, the Accreditation Committee shall review the record, determine the severity of such deficiency(ies) or violation(s), and issue a Deficiency/Violation Decision. In its sole and exclusive discretion, the Committee may issue one or more of the following actions:

24.4.1 Private or Public Reprimand.

24.4.2 Conditions of Continued Accreditation.

24.4.3 Accreditation Probation. The term of a probationary period shall be in one (1) month increments through an initial six (6) months. The Committee may determine the duration of the Probationary Period within this six (6) month time frame.

24.4.4 Accreditation Suspension. The term of a suspension shall be in six (6) month increments, as determined by the Committee.

24.4.5 Accreditation Revocation. After revocation of accreditation by SRCC, a laboratory may apply for accreditation after two (2) years following the date of the revocation.

25.0 Deficiency and Violation Decision Appeals.

A laboratory may appeal an adverse Deficiency Violation Decision, or any part thereof, to the SRCC Appeals Committee, pursuant to the terms of SRCC Appeal Policy.

26.0 Reinstatement and Reapplication Procedures Following Probation, Suspension, and Revocation.

26.1 Probation/Reinstatement: Following the expiration of a final probation decision issued under this Policy, the Accreditation Committee shall determine whether the laboratory has satisfied the terms of the probation, including any related conditions. If the laboratory has satisfied the terms of probation in full, the Committee shall verify that the probation has been completed and reinstate the laboratory to active accreditation status. If the laboratory has not satisfied the terms of probation in full, the Committee shall notify the laboratory of the failure to satisfy the terms of probation and may take the following actions: continuation

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of the probation; and/or, issuance of additional disciplinary or remedial actions concerning the probation terms.

- 26.2 Suspension/Reinstatement: Following the expiration of a final suspension decision issued under this Policy, the Accreditation Committee shall determine whether the laboratory has satisfied the terms of the suspension, including any related conditions. If the laboratory has satisfied the terms of the suspension in full, the Committee shall verify that the suspension has been completed and reinstate the laboratory to active accreditation status. If the laboratory has not satisfied the terms of the suspension in full, the Committee shall notify the laboratory of the failure to satisfy the terms of the suspension and may take the following actions: continuation of the suspension; and/or, issuance of additional disciplinary or remedial actions concerning the suspension terms.
- 26.3 Revocation/Reapplication: Two (2) years after the issuance of a final termination issued under this Policy, the laboratory may submit to the Accreditation Committee a Request for Permission to Reapply for Accreditation status (Reapplication Request). Subject to the time restriction above, the Committee shall consider a Reapplication Request from a laboratory whose status has been terminated. Reapplication Requests must include the following information: (a) The date that the final Deficiency Violation Decision was issued; (b) A statement of the reasons that the laboratory believes support or justify the acceptance of the Reapplication Request, including a statement explaining why the laboratory should now receive accreditation status and why the compliance action no longer applies to the laboratory; and, (c) Copies of any relevant documents or other materials upon which the laboratory relies in support of the Reapplication Request. Within ninety (90) days after the submission of a complete Reapplication Request, or as soon after as practical, the Accreditation Committee shall review the information presented by the laboratory and any other relevant information. The Committee shall then determine the final outcome of the Reapplication Request by majority vote in closed session.
- 26.4 Accreditation Committee Reapplication Request Decisions: Following the Accreditation Committee's review of a Reapplication Request, or as soon as practical, the Committee, by the Committee Chair, shall transmit its decision with respect to the Reapplication Request. The final Committee decision shall indicate whether the Request is granted, denied, or continued to a later date. If appropriate, the decision may include any Program participation conditions that the Committee has required. Copies of the Accreditation Committee decision shall be sent to the parties, via U.S. mail, return receipt requested, or other appropriate delivery method. While no appeal of the Committee decision is permitted, the laboratory may submit a new Reapplication Request pursuant to this Section, one (1) year or more after the issuance of a Committee decision denying a Reapplication Request.

**REQUEST FOR INFORMATION
ON PLANS AND COST ESTIMATES
TO DEVELOP A MINNESOTA-BASED
SOLAR RATING AND CERTIFICATION LABORATORY**

**Minnesota Department of Commerce
Office of Energy Security**

NOTE: This request for information (RFI) does not obligate the state to award a contract or complete the project. Responses to this RFI will be used solely to provide information to the Minnesota Legislature as required by Laws of Minnesota 2008 Chapter 296, Article 1, Section 27.

Project Overview

The Department of Commerce Office of Energy Security (OES) requests information on the establishment of a solar thermal collector rating and certification laboratory in Minnesota, including plans and cost estimates for its development and operation.

Background

The Minnesota Building Code requires that solar thermal collectors installed in Minnesota meet the Solar Rating and Certification Corporation (SRCC) standard OG100 (*2007 Minnesota State Building Code, Chapter 1325.*) http://www.doli.state.mn.us/pdf/bc_2007msbc.pdf p. 270-271.) At present, testing and certification is performed by laboratories in Florida and Ontario.

Under Laws of Minnesota 2008 Chapter 296 Section 27, the Minnesota Legislature directed OES to convene a stakeholder group with technical knowledge of solar energy system design, manufacturing, operation and installation, to develop criteria for a Minnesota-based solar rating and certification laboratory. The findings of that stakeholder group are included in this RFI as Attachment A.

The legislature further directed OES to solicit plans and cost estimates for the development of a solar laboratory in the state, and to report to the legislature on responses to that solicitation.

Goal

It is the goal of this RFI that the OES receives responses sufficient to provide information to the legislature regarding the interest in and capacity for developing and operating a solar rating and certification laboratory in Minnesota, the scope of work necessary to do so, the estimated costs to develop and operate a laboratory, and whether and to what extent non-state funds or revenues might be available for laboratory development and/or operation.

Scope of Information Sought

The OES requests information on:

1. Major tasks and milestones necessary to establish a solar rating and certification laboratory in compliance with Solar Rating and Certification Corporation accreditation requirements and ISO/IEC 17025 standards as recognized by the American Association for Laboratory Accreditation.
2. Estimated laboratory start up costs, including but not limited to costs for design, construction, equipment and accreditation.
3. Estimated annual operating costs and revenues.
4. Suggested standards and testing procedures to assess factors such as out-gassing that may adversely affect indoor air quality.
5. Appropriate field testing and/or laboratory testing methods and modeling methodology for predicting cold-climate collector thermal performance.

Responders are encouraged to provide any additional information that may assist the legislature in assessing the potential costs and benefits of establishing a rating and certification laboratory in Minnesota.

Disposition of Responses

All materials submitted in response to this RFI will become property of the State and will become public record in accordance with Minnesota Statutes, Chapter 13. If a responder elects to submit information in response to this RFI that it believes to be trade secret materials, as defined by the Minnesota Government Data Practices Act, Minn. Stat. § 13.37, the responder must:

- clearly mark all trade secret materials in its response at the time the response is submitted,
- include a statement with its response justifying the trade secret designation for each item, and
- defend any action seeking release of the materials it believes to be trade secret, and indemnify and hold harmless the State, its agents and employees, from any judgments or damages awarded against the State in favor of the party requesting the materials, and any and all costs connected with that defense. In submitting a response to this RFI, the responder agrees that this indemnification survives as long as the trade secret materials are in possession of the State.

Questions

Prospective responders who have any questions regarding this request for information may contact:

Stacy Miller
Department of Commerce, State Energy Office
85 Seventh Place East, Suite 500
Saint Paul, MN 55101

(651) 282-5091
stacy.miller@state.mn.us

Response Submission

Responses should be sent in writing or via e-mail to:

Amy Bicek
Department of Commerce
85 Seventh Place East, Suite 500
Saint Paul, MN 55101

Energy.contracts@state.mn.us

In order to provide sufficient time for response review and follow-up questions and responses, OES requests that responses be submitted no later than Nov. 14, 2008. All costs incurred in responding to this RFI will be borne by the responder.

ATTACHMENT A

SOLAR RATING & CERTIFICATION TECHNICAL STAKEHOLDER GROUP FINDINGS:

- The Solar Rating and Certification Corporation (SRCC) OG-100 standard should serve as the basis for a Minnesota-based solar rating and certification laboratory. Plans for a solar rating and certification laboratory in Minnesota should incorporate SRCC test procedures and standards to assess durability and cold climate performance. In addition, plans should include a proposed standard for indoor air quality in cases where air will be exchanged directly between solar hot air collectors and indoor air.
- Additional operational characteristics should be tested, as long as additional testing does not unduly lengthen the time period necessary to complete the certification process.
 - Add standards and testing to better predict long-term durability. Durability testing in the current SRCC program is limited to stagnation testing to ensure collectors maintain fluid flow system integrity under extreme, short term, temperature conditions and thermal shock conditions. The program does not test materials for possible long term degradation. However, long term testing may be difficult to achieve in light of the desire to limit the testing period.
 - Add standards and test procedures to determine if any effluent from solar air collectors may jeopardize indoor air quality. Concerns were raised related to the use of materials and components in solar hot air collectors that may break down over time or under stagnation conditions. Such degradation may present an indoor air quality hazard. Absorber plate materials and coatings are a specific. The group agreed that this is an issue that should be addressed.
- While some concerns have been expressed about the adequacy of current testing requirements for cold-climate operation, the group concluded that the performance indices generated in the procedures used by SRCC do accurately predict the performance characteristics under cold temperature conditions such as those experienced in Minnesota's climates.