

## PROVIDER APPLICATION PACKET CHECKLIST

**Before filing out this application, please ensure that you have reviewed the Entry Level program “Overview, Process and Policies” available in the Entry Level Provider Info packet.**

Please ensure that the following items are included in the application packet in order to prevent processing delays:

- Application Form
- Certificate of Insurance
- \$300 Annual Fee
- Agreed to provide NABCEP PV Entry Level Certificate of Knowledge Exam at end of course
- Signed Terms of Agreement
- Signed Provider Code of Conduct

# PROVIDER APPLICATION

## TO PARTICIPATE IN THE NORTH AMERICAN BOARD OF CERTIFIED ENERGY PRACTITIONERS (NABCEP)

### PHOTOVOLTAIC (PV) ENTRY LEVEL CERTIFICATE OF KNOWLEDGE

NABCEP's PV Entry Level Certificate of Knowledge is a way for students to show that they have achieved basic knowledge, comprehension and application of key terms and concepts of photovoltaic (solar electric) system operations. The certificate demonstrates that the student has completed the PV Entry Level coursework and has passed an industry-designed, NABCEP-issued exam.

#### Criteria for Participation

- The provider must complete and sign the application and provide the initial \$300 annual fee.
- Students must complete coursework registered with NABCEP from an approved Provider in order to become eligible to sit for the Certificate of Knowledge exam.
- Course(s) must be offered any university, college, community college, or vocational-technical institute accredited by an agency recognized by the U.S. Department of Education; or offered by a Joint Apprenticeship & Training Committee or U.S. Department of Labor approved apprenticeship program; or offered by a training program accredited by the Institute for Sustainable Power or similar accrediting body.
- Course(s) are required to feature an interactive learning environment. Course instruction can take place through in-class exercises or remotely, with periodic feedback of the learner's progress.
- As of July 1<sup>st</sup>, 2009, new applications must provide NABCEP with a CV, resume or summary of experience for each instructor showing a minimum of 40 hours of board-recognized training<sup>1</sup> in advanced solar PV. All installation or equivalent installation experience should also be documented.
- Providers are required to present the NABCEP approved 10 Learning Objectives using a comprehensive pedagogical approach. Course curriculum must refer only to these learning objectives for guidance and can not be based, *in any fashion*, directly upon the Entry Level exam.

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<sup>1</sup> Definition of board recognized training is available on page 8  
PV Entry Level Certificate of Knowledge – Provider Info Packet  
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- Providers must offer special testing accommodations and comply with the provisions of the Americans with Disabilities Act and with Title VII of the Civil Rights Act and other applicable laws.
- All providers must provide a copy of the appropriate Certificate of Insurance(s) demonstrating that professional liability and general liability policies are maintained with respect to the administration of examinations.
- The Provider agrees to make the Entry Level Certificate of Knowledge exam available to any student passing the accompanying course.
- Providers are also responsible for an annual payment of \$300 to NABCEP. This fee covers administrative costs and will ensure that each provider is featured on the NABCEP website

For more details about the Certificate program, please read the "Overview, Process & Policies" document available in the Entry Level Provider Info Packet.

## PROVIDER APPLICATION

Once approved, a service provider is eligible to offer the NABCEP exam for a period of three (3) years\*.

\*NABCEP requires a \$300/year administrative fee from its Entry Level exam providers.

### GENERAL INFORMATION

(Please use additional pages if necessary and/or attach supporting documentation)

DATE: \_\_\_\_\_

NAME OF COLLEGE, SCHOOL, OR ORGANIZATION: \_\_\_\_\_

\_\_\_\_\_

MAILING ADDRESS: \_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

WEB ADDRESS: \_\_\_\_\_

DEPARTMENT: \_\_\_\_\_

### CONTACT INFORMATION FOR THE INDIVIDUAL SUBMITTING THIS APPLICATION:

NAME: \_\_\_\_\_

TITLE: \_\_\_\_\_

TELE: \_\_\_\_\_ EMAIL: \_\_\_\_\_

**CONTACT INFORMATION TO BE POSTED ON THE PUBLICLY AVAILABLE LIST OF APPROVED PROVIDERS on [WWW.NABCEP.ORG](http://WWW.NABCEP.ORG) (if different from above)**

NAME: \_\_\_\_\_

TITLE: \_\_\_\_\_



TELE: \_\_\_\_\_ EMAIL: \_\_\_\_\_

**WILL YOUR EDUCATIONAL INSTITUTION BE UTILIZING A CENTRALIZED TESTING FACILITY TO ADMINISTER THE NABCEP CERTIFICATE OF KNOWLEDGE EXAM?**

CIRCLE:            Yes            No

IF YOU CIRCLED YES, PLEASE PROVIDE CONTACT INFORMATION:

TESTING CENTER CONTACT NAME: \_\_\_\_\_

TITLE: \_\_\_\_\_

TELE: \_\_\_\_\_ EMAIL: \_\_\_\_\_

TESTING CENTER MAILING ADDRESS: (If different from main address given above)

\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

**PLEASE PROVIDE INSTRUCTOR (S) CONTACT INFORMATION:**

*Please attach a CV, resume or summary of experience for each instructor showing a minimum of 40 hours of board-recognized training<sup>2</sup> in advanced solar PV. All installation or equivalent installation experience should also be documented.*

INSTRUCTOR NAME-1: \_\_\_\_\_

TELE: \_\_\_\_\_ EMAIL: \_\_\_\_\_

INSTRUCTOR MAILING ADDRESS-1: (If different from main address given above)

\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

INSTRUCTOR NAME2: \_\_\_\_\_

TELE: \_\_\_\_\_ EMAIL: \_\_\_\_\_

\_\_\_\_\_  
<sup>2</sup> Definition of board recognized training is available on page 8  
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INSTRUCTOR MAILING ADDRESS-2: (If different from main address given above)

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**WILL YOUR INSTRUCTOR(S) BE ADMINISTERING THE NABCEP  
CERTIFICATE OF KNOWLEDGE EXAM?**

CIRCLE:            Yes            No

**IF INDIVIDUAL ADMINISTERING EXAM IS NOT AN INSTRUCTOR, PLEASE  
PROVIDE NAME(S) PHONE NUMBER(S) AND EMAIL ADDRESS(ES):**

EXAM ADMINISTRATOR: \_\_\_\_\_

TELE: \_\_\_\_\_ EMAIL: \_\_\_\_\_

INSTRUCTOR MAILING ADDRESS-1: (If different from main address given above)

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**IMPORTANT:** YOUR INSTITUTION OR PROGRAM MUST HOLD AN ACCREDITATION  
RECOGNIZED BY THE DEPT. OF EDUCATION OR EQUIVALENT THIRD-PARTY (i.e.  
ISPO) OR BE AFFILIATED WITH A JOINT APPRENTICESHIP & TRAINING COMMITTEE  
OR A U.S. DEPARTMENT OF LABOR APPROVED APPRENTICESHIP PROGRAM.  
PLEASE DESCRIBE WHICH OF THESE CIRCUMSTANCES APPLY:

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**COURSE (S) OR WORKSHOP TITLE:** \_\_\_\_\_

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**DOES YOUR INSTITUTION OFFER OR PLAN TO OFFER INSTRUCTION IN SOLAR THERMAL OR SMALL WIND TECHNOLOGIES? IF SO, PLEASE DESCRIBE:**

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**DOES YOUR INSTITUTION OFFER, OR PLAN TO OFFER, AN ASSOCIATES OR BACHELOR'S DEGREE PROGRAM(S) IN RENEWABLE ENERGY TECHNOLOGIES? IF SO, PLEASE DESCRIBE:**

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**Board-recognized training:**

Training must meet the following criteria to be considered board-recognized training:

- a) A minimum of 40 hours cumulative (can include product training)
- b) Have a formal training format, with a teacher-learner structure. This implies a connection between a learner and a learning source. It can include classroom time led by an instructor and/or discussion leader. It can also include activities in which a learner is engaged in a planned learning event in which he/she is separated from faculty and other students but where the learner receives some sort of feedback and the learner's progress is monitored. Examples include computer-assisted instruction, interactive video/CD/DVD and/or web site learning.
- c) Covers core competencies from the PV Installer Task Analysis, including the National Electrical Code® and OSHA safety standards relevant to PV installation

Types of training programs may include but are not limited to:

- 1. Offered by any accredited university, college, or community college (i.e. Lane CommunityCollege, San Juan College,)
- 2. Dedicated independent training programs (e.g. Florida Solar Energy Center, Solar Energy International, Great Lakes Renewable Energy Association, etc.)
- 3. Apprenticeship training programs (e.g. National Joint Apprenticeship Training Committee, Department of Labor approved apprenticeship programs)
- 4. Those approved by State Contractor Licensing Boards
- 5. Vocational/Technical training programs (e.g. Board of Cooperative Educational Services/New York, British Columbia Institute of Technology)
- 6. Industry in-house training programs (i.e. Manufacturers)

## **NABCEP ENTRY LEVEL CERTIFICATE OF KNOWLEDGE LEARNING OBJECTIVES**

The following NABCEP Entry Level Certificate of Knowledge Learning Objectives are the basis for course instruction and examinations. Please document how your curriculum addresses each of the learning objectives individually.

- Supporting documents such as a syllabus or powerpoint must be referred to in a detailed manner, thank you.

<b>1. PV Markets and Applications</b>
Task/Skill
1.1. Describe history of PV technology and industry
1.2. Describe markets and applications for PV (grid-tie, remote homes, telecom, etc.)
1.3. Identify types of PV systems (direct motor, standalone with storage, grid-backup, etc.)
1.4. Associate key features and benefits of PV with applications

PLEASE STATE HOW YOUR CURRICULUM ADDRESSES LEARNING OBJECTIVE #1:

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<b>2. Safety Basics</b>
Task/Skill
2.1. Identify safety hazards of operational and non-operational PV systems
2.2. Identify safety hazards, practices and protective equipment during PV system installation and maintenance (electricity, batteries, roof work)

PLEASE STATE HOW YOUR CURRICULUM ADDRESSES LEARNING OBJECTIVE #2:

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<b>3. Electricity Basics</b>
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Task/Skill
3.1. Explain difference between energy and power
3.2. Define basic electrical terms
3.3. Describe the use of digital multi-meter
3.4. Calculate simple circuit values

PLEASE STATE HOW YOUR CURRICULUM ADDRESSES LEARNING OBJECTIVE #3:

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<b>4. Solar Energy Fundamentals</b>
Task/Skill
4.1 Define basic solar terms (e.g., irradiation, Langley, azimuth)
4.2 Determine true (solar) south from magnetic (compass) south given a declination map
4.3 Describe Basic solar movement and effect of earth tilt
4.4 Predict solar position using solar path diagrams
4.5 Describe angular effects on the irradiance of array
4.6 Identify factors that reduce/enhance solar irradiation
4.7 Determine average solar irradiation on various surfaces
4.8 Convert solar irradiation into a variety of units
4.9 Determine effect of horizon on solar irradiation (shading)
4.10 Demonstrate use of Solar Pathfinder or sun charts

PLEASE STATE HOW YOUR CURRICULUM ADDRESSES LEARNING OBJECTIVE #4:

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<b>5. PV Module Fundamentals</b>
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Task/Skill
5.1. Explain how a solar cell converts sunlight into electric power
5.2. Label key points on a typical IV curve
5.3. Identify key output values of solar modules using manufacturer literature
5.4. Illustrate effect of environmental conditions on IV curve
5.5. Illustrate effect of series/parallel connections on IV curve
5.6. Define measurement conditions for solar cells and modules (STC, NOCT, PTC)
5.7. Compute expected output values of solar module under variety of environmental conditions
5.8. Compare the construction of solar cells of various manufacturing technologies
5.9. Compare the performance and characteristics of various cell technologies
5.10. Describe the components and construction of a typical flat plate solar module
5.11. Calculate efficiency of solar module
5.12. Explain purpose and operation of bypass diode
5.13. Describe typical deterioration/failure modes of solar modules
5.14. Describe the major qualification tests and standards for solar modules

PLEASE STATE HOW YOUR CURRICULUM ADDRESSES LEARNING OBJECTIVE #5:

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<b>6. System Components</b>
Task/Skill
6.1. Describe most common solar module mounting techniques (ground, roof, pole)
6.2. Compare features and benefits of different solar mounting techniques
6.3. Explain the relationship between solar module cell temperature and environmental conditions, given mounting method (e.g., NOCT)
6.4. Describe purpose and operation of main electrical BOS components (inverter, charge controller, combiner, ground fault protection, battery, generator)
6.5. Identify key specifications of main electrical BOS components (inverter, charge controller, combiner, battery, generator)

PLEASE STATE HOW YOUR CURRICULUM ADDRESSES LEARNING OBJECTIVE #6:

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<b>7. PV System Sizing</b>	
Task/Skill	
7.1.	Illustrate interaction of typical loads with IV curve (battery, MPPT, dc motor)
7.2.	Analyze load demand for stand-alone and grid interactive service
7.3.	Identify typical system electrical output derating factors
7.4.	Calculate estimated peak power output (dc and ac)
7.5.	Calculate array and inverter size for grid-connected system
7.6.	Calculate estimated monthly and annual energy output of grid-connected system
7.7.	Explain relationship between array and battery size for stand-alone systems
7.8.	Calculate array, battery and inverter size for stand-alone system

PLEASE STATE HOW YOUR CURRICULUM ADDRESSES LEARNING OBJECTIVE #7:

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<b>8. PV System Electrical Design</b>	
Task/Skill	
8.1.	Determine series/parallel PV array arrangement based on module and inverter specifications
8.2.	Select BOS components appropriate for specific system requirements
8.3.	Determine voltage drop between major components

PLEASE STATE HOW YOUR CURRICULUM ADDRESSES LEARNING OBJECTIVE #8:

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<b>9. PV System Mechanical Design</b>
Task/Skill
9.1. Describe the relationship between row spacing of tilted modules and sun angle
9.2. Describe the mechanical loads on a PV array (e.g., wind, snow, seismic)

PLEASE STATE HOW YOUR CURRICULUM ADDRESSES LEARNING OBJECTIVE #9:

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<b>10. Performance Analysis and Troubleshooting</b>
Task/Skill
10.1. Describe typical system design errors
10.2. Describe typical system performance problems
10.3. Associate performance problems with typical causes
10.4. List equipment needed for typical system performance analysis
10.5. Compare actual system power output to expected
10.6. Identify typical locations for electrical/mechanical failure

PLEASE STATE HOW YOUR CURRICULUM ADDRESSES LEARNING OBJECTIVE #10:

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Please have the instructor documenting the learning objectives provide his/her name and signature below.

SIGNATURE \_\_\_\_\_

PLEASE PRINT NAME \_\_\_\_\_

DATE \_\_\_\_\_

**ADVISEMENT**

**PLEASE BE ADVISED YOU ARE REQUIRED TO OFFER THE ADMINISTRATION OF THE NABCEP ENTRY LEVEL CERTIFICATE OF KNOWLEDGE EXAM TO YOUR STUDENTS AT THE END OF YOUR COURSE OR SERIES OF COURSES. DO YOU AGREE TO DO SO?**

CIRCLE:                      Yes                      No

**\*PLEASE ATTACH A COPY OF THE APPROPRIATE CERTIFICATE OF INSURANCE (S)**

*This will usually take the form of a copy of your Commercial/General Liability coverage. In the case of some State institutions belonging to a self-insurance fund, a statement to that effect from a duly-recognized representative on official letterhead may be substituted.*

*If insurance documentation will be sent separately, please be advised your application will be held for processing until it is complete.*

Check here if insurance documentation is included in packet:

Check here if insurance documentation is being sent separately:

(NABCEP is not responsible for the misplacement of documents sent separately from this application. Please make sure documents sent separately are well-labeled.)

## TERMS OF AGREEMENT

As an authorized representative of the identified organization, I represent and agree to the following: All of the information provided in this application is true and correct to the best of my knowledge. Approval of the Provider to participate in this PV Entry Level Certificate of Knowledge program cannot be transferred to another organization without prior approval from NABCEP. The organization will conduct all activities related to the NABCEP PV Entry Level Certificate of Knowledge program consistent with applicable laws, including the Americans with Disabilities Act and Title VII of the Civil Rights Act. The organization will satisfy the requirements of all applicable NABCEP policies, and maintain the security of the examination and confidentiality of the test items. NABCEP's logo or certification mark cannot be used on any course or promotional material or advertisement unless approved by NABCEP. Upon review of this application, NABCEP can request additional material. NABCEP's approval of this application can be revoked if the Provider is non-compliant with any of the policies established by NABCEP.

SIGNATURE \_\_\_\_\_

PLEASE PRINT NAME \_\_\_\_\_

DATE \_\_\_\_\_

Please sign the Code of Conduct below and return your completed application to:

Timothee Neron-Bancel, Operations Manager  
North American Board of Certified Energy Practitioners  
Saratoga Technology + Energy Park  
10 Hermes Road, Suite 400  
Malta, NY 12020  
Phone: (518) 289-4859  
Fax: (518) 899-1092  
Email: [tneron-bancel@nabcep.org](mailto:tneron-bancel@nabcep.org)

APPROVED BY NABCEP: \_\_\_\_\_

DATE: \_\_\_\_\_

## Code of Conduct for Providers of the Entry Level Certificate of Knowledge Exam

1) Marketing and Advertising:

- As NABCEP does not provide, offer, administer or approve courses or training so please refrain from using the following words, expressions and their derivatives: "certification"; "NABCEP training"; "NABCEP instructors".
- The NABCEP Entry Level COK exam does not prepare an individual as an installer and NABCEP asks that no course associated with the COK exam claim to prepare participants as installers, either through its title or description.
- You may not in any way associate the NABCEP name or logo with any promises of employment.
- The NABCEP rectangular logo cannot be used without prior review and written approval of NABCEP staff,
- The NABCEP circular Installer trademark with design can only be used by Certified Installers and then only with the inclusion of their name and Certificant number.
- It is your responsibility as a provider to ensure that the use of the NABCEP name, logos and other references are accurate, truthful, complete, and in compliance with any and all NABCEP policies.

2) Instructors and Training

- The course(s) leading up to the administration of the NABCEP Entry Level exam must cover all of the 10 Learning Objectives specified for this COK.
- Please notify NABCEP of any change in instructor or test administrator and provide updated CVs

3) Administration of the Entry Level COK Exam

- The Provider must administer the Entry Level exam from the approved location covered by the certificate of liability insurance provided in the application.
- Providers who wish to administer the COK exam in other locations must seek approval from NABCEP 30 days in advance by showing appropriate testing procedures and a certificate of liability insurance for the new exam administration site.
- Previous terms of agreements from the Entry Level Provider Info Packet and those distributed to you by Professional Testing, Inc remain in effect.
- From now on, please present the short 'NABCEP Basics' presentation before each administration of the NABCEP Certificate of Knowledge exam.
- NABCEP has the right to revoke or suspend COK Provider approval at any time if at its sole discretion it feels that the NABCEP name, trademark or logos are being misused or devalued in any way by the Provider.

As a representative of the identified organization, I agree to adhere to this Code:

SIGNATURE \_\_\_\_\_

PLEASE PRINT NAME \_\_\_\_\_

DATE \_\_\_\_\_