

Testimony
Bruce Angeloszek
CT Electrical.com
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Legislative Office Building

Sen. Colapietro, Rep. Shapiro and members of the committee, My name is Bruce Angeloszek, I am a self-employed electrical contractor from the town of Beacon Falls, providing Residential, Commercial, Industrial, and PV solar installations since 1994, and I am here today **in support of House Bill 5225. An Act Concerning Solar Work**, which will ensure that properly licensed electricians are eligible as qualified installers under the CT Clean Energy Program and address safety concerns regarding the limited PV 1 and PV 2 licenses in the State of Connecticut which we believe should be sunsetted. I would like to share you the highlights of this matter.

I have proudly earned an E-1 unlimited electrical license in Connecticut by getting 12,000 hours of on the job training, 720 hours of class room training, and have worked hard to start and sustain an electrical contracting company. If a company would like to install electrical work, according to the National Electrical Code about article 690 is electrical work then one needs to become an electrical contracting firm by following Connecticut law.

- We license holders in Connecticut work hard to earn our licenses and continue to with CEU courses mandated by our State.
- By introducing a limited PV license, an E-1 unlimited license holders, that earned a license loses value.
- By introducing the limited license for PV we in Connecticut are opening up other industries to do the same Example swimming pool companies will want a limited license for wiring swimming pools, Landscape companies will want a limited license to wire landscape lighting and so on how could we deny other industry and allow PV, and before we know it E-1 and E-2 licenses have no value.

The National Electrical Code states (NEC)

- The *National Electrical Code (NEC)* is written for persons who understand electrical terms, theory, safety procedures, and electrical trade practices. These individuals include electricians, electrical contractors, electrical inspectors, electrical engineers, designers, and other qualified persons. The *Code* was not written to serve as an instructive or teaching manual for untrained individuals [90.1(C)]

1. **The NEC contains approximately 140 Articles** of importance, and each of which covers a specific subject. For example:

- Article 110 General Requirements
- [Article 250 Grounding]
- Article 300 Wiring Methods
- Article 430 Motors
- Article 500 Hazardous (Classified) Locations
- [Article 680 Swimming Pools, Spas, Hot Tubs, and Fountains]
- and [Article 690 Photo Voltaic]

- Article 690 Photo voltaic was introduced in the National electrical code in 1984

- In general, electrical limited licenses in Connecticut work with low voltages up to 48 volts, or high voltage over 600 volts

- E-1 is Unlimited electrical work is 0 to 600 volts with 12,000 hours of on the job training, and 720 hours of related instruction

- (2) "Electrical work" means the installation, erection, maintenance, alteration or repair of any wire, cable, conduit, busway, raceway, support, insulator, conductor, appliance, apparatus, fixture or equipment that generates, transforms, transmits or uses electrical energy for light, heat, power or other purposes, but does not include low voltage wiring, not exceeding twenty-four volts, used within a lawn sprinkler system

- **Safety issues**

- Photo voltaic systems could have dangerous voltages of up to 600 volts dc and even more dangerous is voltages of 277 nominal AC volts to ground. This means limited licensed personnel with 4000 hours of on the job training could potentially come in contact with 480 volts AC line to line in an industrial environment and 240 AC volts line to line in a residential environment without the supervision of an E-1 electrician. Many hours of the E-1 and E-2 on the job training comes from normal trade practices that have been past down from journeyman to journeyman since the 1900's. An example of a trade practice is the color coding of conductors. The code does not specify blue, red, black for

120/240 or 120/208 electrical systems and brown, orange and yellow for the 277/480 volt systems. Get these wiring systems mixed up and you have an electrocution.

- When installing a line side tap of which is connecting the solar system ahead of the fuse protection for the building creates a real dangerous situation. The utility transformers have anywhere from 25 to 50 thousand fault amps before the utility fuse blows, if it blows at all. An example of this power is when you have a utility line down during a storm; it keeps arcing till the utility company shuts down the system. Imagine this within a building, eventually no more building because of the massive fire.

- By approving PV-1 and PV-2 limited license holders with only 4000 hours of on the job training, working with voltages over 48 volts could be fatal to the workers as well as to those around them. PV-1 and PV-2 limited license holders should not be able to come in contact with any electrical panel boards of any voltages because of all the dangers that a licensed electrician has learned to avoid during their apprenticeship and years in the trade.

The North East Utility information and guideline policy for electric supply below 600 volt -

- Section 2: residential cut and reconnect policy - Residential cut and reconnect policy restricted to two wire 120 volt three-wire 120/240 volt or three wire 120/208 volt or single-phase overhead residential services of 400 amps or less. The electrician shall cut the service entrance cable at the weather-head, replace or repair the service and reconnect it may only be performed by an E-2 journey person or apprentice working under the direct supervision of an E-1 or E-1 licensee. All applicable rules of the state of Connecticut Department of Consumer Protection - Occupational & Professional Licensing Division apply