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Submitted electronically via: samantha.meserve@state.ma.us

Re: Commonwealth of Massachusetts Alternative Energy Portfolio Standard

Conserval Systems Inc. respectfully submits these comments to the 2016 Alternative Energy Portfolio Standard (APS) Regulations and Alternative Portfolio Standard Guideline.

Our company, Conserval Systems Inc., invented and commercialized *Solar Air Heating* around the world. Known as SolarWall®, our technology offsets the huge amount of energy used to heat & ventilate large commercial and industrial buildings. The SolarWall® technology has been honored alongside Thomas Edison, Henry Ford, George Westinghouse, Willis Carrier, the steam engine and the Panama Canal by the American Society of Mechanical Engineers (ASME). SolarWall systems are in use in 40 countries around the world, including extremely strong usage by the United States Military. They are applicable to the entire building stock, in both new construction and in retrofit.

Massachusetts is a heating climate with space heating accounting for over 40% of the energy used by commercial buildings. Solar air heating technologies offer substantial environmental benefits by addressing this large use of conventional energy – and corresponding CO2 emissions. As such, we are pleased to see solar air / solar space heating contemplated in the Alternative Portfolio Standard and we offer the following suggestions to create a strong program base that will allow for uptake in projects.

- 1) In the Alternative Energy Portfolio Standard (APS) Regulations under 16.02 Definitions; the definition of Useful Thermal Energy reads:

Useful Thermal Energy. Energy (a) in the form of direct heat, steam, hot water, or other thermal form that is used in production and beneficial measures for heating, cooling, humidity control, process use, or other valid thermal end use energy requirements and (b) for which fuel or electricity would otherwise be consumed.

We propose a verbiage amendment (in red) to say the following:

Useful Thermal Energy. Energy (a) in the form of direct heat, steam, hot water, hot air, or other thermal form that is used in production and beneficial measures for heating, cooling, humidity control, process use, or other valid thermal end use energy requirements and (b) for which fuel or electricity would otherwise be consumed.

This ensures that solar heated air is explicitly stated.

- 2) In the Alternative Energy Portfolio Standard (APS) Regulations under Section 6,a, iv; the Definition of Solar Thermal currently reads:

iv. Solar Thermal. A solar thermal unit uses flat plate, evacuated tube, or concentrating collectors, to transfer solar irradiation energy to a working fluid, as well as a pump or fan to actively circulate the air, water, or other working fluid through the collectors. Solar thermal collectors must have a performance certification issued by the Solar Rating and Certification Corporation, or other performance certification approved by the Department.

We propose a verbiage amendment (in red) to say the following:

iv. Solar Thermal. A solar thermal unit uses a collector to transfer solar irradiation energy to a working fluid, as well as a pump or fan to actively circulate the air, water, or other working fluid through the collectors. Solar thermal collectors must have a performance certification issued by the Solar Rating and Certification Corporation, or other performance certification approved by the Department.

We suggest this amendment to ensure that variations in solar thermal collectors don't result in exclusions from the program. For example, solar air heating systems can be glazed or unglazed, and typically use a metal collector which can be corrugated or flat panel. The essential requirement is to ensure the SRCC Certification which means it is a solar thermal collector tested to the appropriate international standard.

- 3) In the Alternative Portfolio Standard Guideline on Metering for Transpired Solar Air Heating systems, please see the attached schematics for "Transpired Solar Air Heating Systems" for our recommended additions to this document.
- 4) In terms of the designations of different system sizes, we propose the following for solar air heating systems as it is more reflective of typical size ranges:

The designation for "Large" Systems should be at 10,000 ft² + of solar collector
The designation for "Intermediate" Systems should be at 2,500 ft² - 9,999 ft² of solar collector

The designation for "Small" Systems should be at < 2,499 ft² of solar collector

- 5) In terms of the multiplier that would be required to make the program financially viable for potential clients, please see below. Also, please note that in the State of Massachusetts there is no other incentive program for Solar Air Heating.

Based on a typical installation, a Transpired Solar Air Heating system should generate 1 AEC per year, per 35ft² of solar collector.

Based on a Transpired Solar Air Heating System cost of \$30/ft² for Small and Intermediate Systems, and \$35/ft² for Large Systems, and an AEC net value of \$17/AEC, a multiplier of 12 (M=12) would be required to achieve a 4 year payback for a Transpired Solar Air Heating System (in the absence of any additional incentives).

Therefore we recommend that a multiplier of 12 is required for Solar Air Heating.

Thank you for the opportunity to comment. We look forward to continuing to participate in the Alternative Portfolio Standard Stakeholder process.

Respectfully Submitted,

Sincerely,

A handwritten signature in black ink that reads "Victoria Hollick". The script is fluid and cursive, with the first letter of each word being capitalized and larger than the others.

Victoria Hollick, President Conserval Systems Inc.