REC 17-027

February 6, 2017

Debra Howland
Executive Director
State of New Hampshire Public Utilities Commission
21 S. Fruit St, Suite 10
Concord, NH 03301-2429

RE: Application to Qualify as Independent Monitor for State of New Hampshire

Dear Ms. Howland,

Attached please find Power Factors' application to qualify as an independent monitor for the State of New Hampshire. Power Factors has been a certified third-party reporting entity for PJM and Massachusetts Clean Energy Center (Mass CEC) since 2015, reporting solar energy production for thousands of residential homeowners via automated web-based reporting interfaces provided by those groups (see Attachment A-1 and Attachment A-2).

Power Factors intends to conduct all monitoring remotely via electronic monitoring and hereby requests waivers to PUC rules 2505.09(i)(1). Accordingly I have not initialed the associated row in the attached application. Our role with clients is similar to PowerDash (REC 16-215), Solar Data Systems (REC 16-474), and SolarEdge (in process), with the critical distinction that Power Factors is hardware-agnostic. We do not manufacture, procure, or install metering equipment on behalf of our clients; instead, we remotely read data from customers' onsite equipment of choice over the internet. Please review Attachment A to this letter for an explanation of how compliance with PUC 2505.09(i)(1) would be onerous and inapplicable given our circumstances and how the purpose of the rule would be satisfied by alternative methods we are prepared to implement if approved.

Power Factors' remote data capabilities leverage proven technology provided by energy industry veterans. Our platform is built upon OSIsoft's industry-standard PI Time Series Historian, used by a diverse set of power industry giants from the California ISO to NRG, Duke Energy, and Pacific Gas & Electric due to the platform's stability and data integrity. Our clientele, responsible for over 6GW of solar power in the United States, relies on our software for asset management, financial performance monitoring, and billing. The financiers, banks, and utilities with whom we contract recognize Power Factors as a bank-quality data system. Given our experience in the space, the New Hampshire PUC can have high confidence in robust, reliable, accurate reporting from the Power Factors platform.

Thank you very much for your consideration. Please contact me directly regarding any questions or additional data requests that arise.

Best,

Will Troppe
Senior Analyst, Technical Solutions
Power Factors
415.233.0066
will.troppe@powerfactorscorp.com

State of New Hampshire
Public Utilities Commission

21 S. Fruit Street, Suite 10, Concord, NH 03301-2429

APPLICATION TO QUALIFY AS AN INDEPENDENT MONITOR

TO VERIFY ELECTRICITY OR USEFUL THERMAL ENERGY PRODUCTION FROM ELIGIBLE CUSTOMER-SITED SOURCES*

This independent monitor application must be filed with the Executive Director of the New Hampshire Public Utilities Commission (Commission). *The completed original application, as well as two copies and a cover letter requesting certification should be sent to:*

Debra Howland
Executive Director
State of New Hampshire
Public Utilities Commission
21 S. Fruit St, Suite 10
Concord, NH 03301-2429

An electronic version of the docket filing should be submitted to executive.director@puc.nh.gov and barbara.bernstein@puc.nh.gov. Contact Barbara Bernstein by email or phone 603-271-6011 with questions.

Any omissions and/or deficiencies which need to be corrected must be completed in a timely manner or the Commission may close the application process without prejudice.*

Please complete the following:						
Applicant Name:	William Troppe					
Business Name:	Power Factors					
Mailing Address 1:	80 E Sir Francis Drake Blvd					
Mailing Address 2:	Suite 2F					
Town/ City:	Larkspur	State:	CA	Zip Code:	94939	
Telephone:	415-233-0066	Cell:	415-233-0066			
email	Will.troppe@powerfactorscorp.com					

2505.09	Independent Monitors
2505.09(a)	*An independent monitor shall verify the electricity production of a customer-sited source or the production of useful thermal energy from an eligible source and report such production and REC calculation to the GIS.*
2505.09(b)	*A distribution utility shall be eligible to serve as an independent monitor for customer-sited sources and sources producing useful thermal energy within its service territory, provided that the distribution utility employs one or more persons to perform monitoring tasks who meet the qualifications specified in paragraph (c) or (d). (See below).*

As **ATTACHMENT A**, please provide a copy of the license issued by the state of New Hampshire or such other qualifying certification as may be applicable.		
	Electrical Production Independent Monitors	
2505.09(c)	*To qualify as an independent monitor who verifies **electrical production** please indicate which of the following apply to the applicant:*	
2505.09(c)(1)	An electrician licensed by the state of New Hampshire and in good standing.	☐
2505.09(c)(2)	A professional engineer licensed by the state of New Hampshire and in good standing.	☐
2505.09(c)(3)	A certified building analyst professional or a certified mechanical professional as certified by the Building Performance Institute, Inc. of Malta, New York.	☐
2505.09(c)(4)	A certified energy manager as certified by the Association of Energy Engineers.	☐
2505.09(c)(5)	A home energy rater as certified by Residential Energy Services Network (RESNET)	☐
2505.09(c)(6)	Certified as an independent monitor under a renewable portfolio standard program in another state.	☒

	Useful Thermal Energy Independent Monitors	
2505.09(d)	*To qualify as an independent monitor who verifies **useful thermal energy production** please indicate which of the following apply to the applicant:*	
2505.09(d)(1)	A professional engineer licensed by the State of NH and in good standing.	☐
2505.09(d)(2)	***For verification of useful thermal energy from solar thermal sources***, a North American Board of Certified Energy Practitioners (NABCEP) Certified Solar Heating Installer	☐
2505.09(d)(3)	***For verification of useful thermal energy from geothermal sources*** an International Ground Source Heat Pump Association (IGSHPA) Accredited Geothermal Installer	☐

Provide your initials as an indication that you have read the following as it pertains to Independent Monitors and agree to uphold the rule.	**Initials**

2505.09(a)	An independent monitor shall verify the production of a customer-sited source or the production of useful thermal energy from an eligible source and report such production and REC calculations to the GIS. Such a customer-sited source or a source producing useful thermal energy shall either retain the services of an independent monitor directly or, if participating in aggregation pursuant to Puc 2506, through an aggregator.	WT
2505.09(b)	A distribution utility that is a distribution company shall be eligible to serve as an independent monitor for customer-sited sources and sources producing useful thermal energy within its service territory, provided that the distribution utility employs one or more persons to perform monitoring tasks who meet the qualifications specified in paragraph (c) or (d).	WT
2505.09(g)	No customer-sited source or source producing useful thermal energy shall use an independent monitor: • who is a member of the immediate family of the owner of the source, or, • who holds a direct or indirect ownership interest in the source, or, • who sold or installed the equipment used by the source.	WT
2505.09(h)	The fact that a provider of electricity installed the customer-sited source or source producing useful thermal energy shall not be a disqualifying relationship.	WT
2505.09(i)	*The duties of the independent monitor shall be:*	**Initials**
2505.09(i)(1)	To perform an initial inspection of source's meter for accuracy and capability to measure the electricity or useful thermal energy produced, unless the meter is owned by a distribution utility that has already inspected it pursuant to Puc 305.	**N/A – see cover letter**
2505.09(i)(2)	To measure quarterly the source's electricity or useful thermal energy production or displacement used to qualify for certificates pursuant to the GIS operating rules.	WT
2505.09(i)(3)	To report the production of electricity or useful thermal energy from the source and the REC calculation to the customer and the GIS quarterly in accordance with the GIS operating rules.	WT
2505.09(j)	An independent monitor shall not receive compensation for monitoring services that is a function of the number of certificates issued to any source using the independent monitor.	WT
2505.09(k)	An independent monitor shall provide the commission with the notice prior to discontinuing services as a monitor.	WT

Describe your rates for Renewable Energy Source Eligibility for Independent Monitoring (add lines as needed).		
Description:	Unit	Rate
	Per hour	$N/A
	Flat fee	$N/A
	Annual	$N/A

AFFIDAVIT

The undersigned applicant declares under penalty of perjury that contents of this application are accurate.

Applicant's Signature _____ Date 2/6/2017

Applicant's Typed Name WILLIAM TROPPE

Subscribed and sworn before me this _____ Day of _____ (month) in the year _____

County of _____ State of _____

See attached _____

Notary Public/Justice of the Peace

My Commission Expires _____

ACKNOWLEDGMENT

"A Notary Public or other officer completing this certificate verifies only the identity of the individual who signed the document to which this certificate is attached, and not the truthfulness, accuracy, or validity of that document."

STATE OF CALIFORNIA)
)
COUNTY OF Marin)

On February 6, 2017, before me, Cynthia D. Trutner, a Notary Public, personally appeared William Tuppe, who proved to me on the basis of satisfactory evidence to be the person(s) whose name(s) is/are subscribed to the within instrument and acknowledged to me that he/she/they executed the same in his/her/their authorized capacity(ies), and that by his/her/their signature(s) on the instrument the person(s), or the entity upon behalf of which the person(s) acted, executed the instrument.

I certify under PENALTY OF PERJURY under the laws of the State of California that the foregoing paragraph is true and correct.

WITNESS my hand and official seal.

Signature Cynthia D. Trutner (Seal)

CYNTHIA D. TRUTNER
COMM. # 2178000
NOTARY PUBLIC-CALIFORNIA
MARIN COUNTY
MY COMM. EXP. JAN. 27, 2021

Attachment A - 1

MASSACHUSETTS CLEAN ENERGY CENTER

DATA ACQUISITION SYSTEMS (DAS) Service Providers

Many MassCEC renewable energy incentive programs require that the completed project report electrical generation to the online Production Tracking System (PTS) via an automated Data Acquisition System for a period of time (up to several years). Programs with this requirement include*:

- **SREC systems over 10 kW (DC)** *(including **Massachusetts Solar Loan** projects)*
- **Commonwealth Solar II, Solarize Massachusetts, and Massachusetts Solar Connect** projects do not require reporting regardless of size but may require reporting if selling SRECs.
- **Community Wind**
- **Hydro**
- **Organics to Energy**

*Note that this list is not intended to be comprehensive, and that project proponents should check with their MassCEC Project Managers regarding project requirements.

The following companies provide Data Acquisition Systems and related services. If you are a DAS provider and would like to add your company to the list below, please contact pts@masscec.com with your information.

DAS Providers who provide Data Monitoring for General Sites

AlsoEnergy www.AlsoEnergy.com Tel: 866-303-5668 info@AlsoEnergy.com	**ApterraTechnologies, LLC** www.ApterraTech.com Tel: 978-430-9069 info@ApterraTech.com	**Automated Building Systems, Inc.** www.absddc.com Tel: 508-967-8283 mgood@absddc.com
Clean Energy Design, LLC www.cleanenergydesign.com Tel: 508-563-6990 info@cleanenergydesign.com	**DECK Monitoring** www.DECKMonitoring.com Tel: 503-224-5546 info@DECKMonitoring.com	**Diaspark** www.diasparkenergy.com Tel: 917-607-8027 tim.meyer@diaspark.com
Draker, Inc. www.drakerenergy.com Tel: 866-486-2717 sales@drakerenergy.com	**Heliotronics** (a MA based manufacturer) www.heliotronics.com Tel: 781 749 9593 info@heliotronics.com	**Locus Energy** www.locusenergy.com Tel: 877-LOCUS-EN Tel: 646-660-5223 info@locusenergy.com
MicroNet Solutions, LLC www.micronetgroup.com Tel: 678-990-9800 srinik@micronetgroup.com	**Texas Instruments** **(formerly National Semiconductor)** www.ti.com Tel: 877-765-6244	**NextGrid Technologies** www.nextgridtech.com Tel: 832-220-5882 sales@nextgridtech.com
Noveda www.noveda.com Tel: 908-534-8855 support@noveda.com	**PowerDash Inc.** www.powerdash.com Tel: 888-797-3274 support@powerdash.com	**Bel Power Solutions** **(formerly Power-One, Inc.)** www.belpowersolutions.com Tel: 866-513-2839

MASSACHUSETTS CLEAN ENERGY CENTER

DAS Providers who provide Data Monitoring for General Sites (continued)

PowerPlay Solar www.powerplaysolar.com Tel: 800-797-7529 info@powerplaysolar.com	**PVDAS** www.pvdas.com Tel: 978-456-6855 info@pvdas.com	**Servotech** www.servotechinc.com Tel: 732-910-1458 email@servotechinc.com
Skytron Energy www.skytron-energy.com sales@skytron-energy.com	**SolarEdge Technologies** www.solaredge.com Tel: 877-360-5292 infoNA@solaredge.com	**Sorapro** www.sorapro.com Tel: 855 767-2776 sales@sorapro.com
Sun Edison LLC www.sunedison.com Tel: 443-909-7200 For Email Please Visit: www.sunedison.com/services	**Trimark Associates, Inc.** www.trimarkassoc.com 916-357-5970 dataservices@trimarkassoc.com	

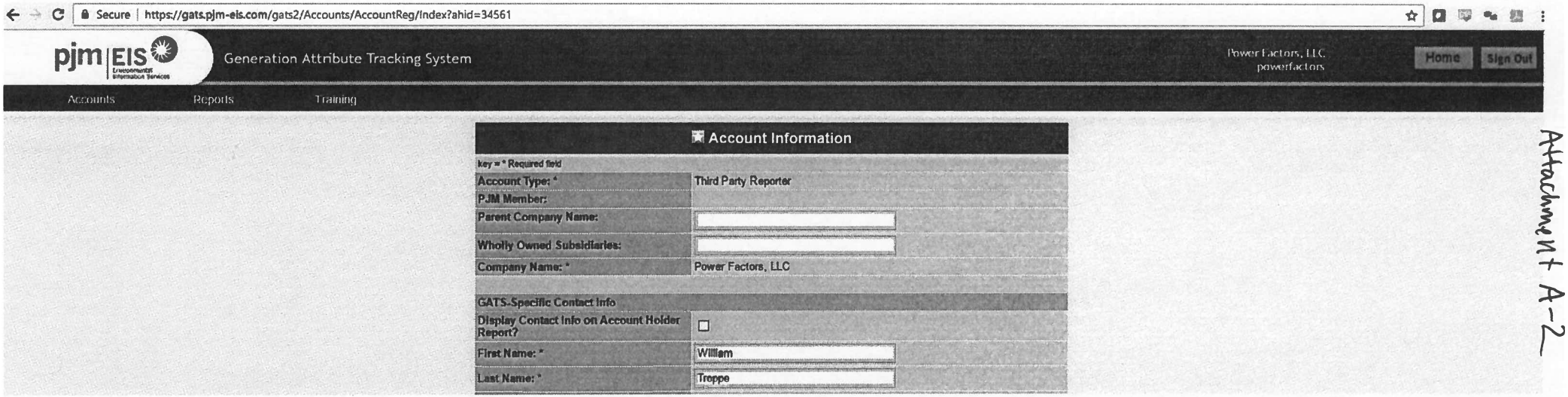
MASSACHUSETTS CLEAN ENERGY CENTER

DAS Providers who provide Data Monitoring for Select Sites

Advanced Energy Power Solutions (formerly PVPowered, Inc) www.advanced-energy.com Tel: 541-312-3832 (used with Advanced Energy inverters only)	**Alteris Renewables, Inc.** www.alterisinc.com Tel: 800-339-7804 info@alterisinc.com (used with systems installed by Alteris only)	**Ampion, LLC** www.ampion.net Tel: 617-433-7935 mdeancarpentier@ampion.net (used with Ampion systems only)
Consolidated Edison Development, Inc. http://coneddev.com Tel: 914-993-2132 (used with systems owned by ConEdison Development only)	**eGauge Systems** www.egauge.net Tel: 877-342-8431 ext. 1 sales@egauge.net (used with eGauge Systems meters only)	**Energy Tracking, LLC** www.energytracking.com Tel: 973-448-8660 support@energytracking.com (used with EnergyTracking meters and pulse loggers only)
Gloria Spire Solar, LLC www.gloriaspire.com Tel: 781-275-1677 ext. 212 dherbert@gloriaspire.com (used with systems installed by Gloria Spire Solar only)	**Green Harbor Energy** www.greenharborenergy.com 678-718-4738 dsandlin@greenharborenergy.com (used with Green Harbor Energy systems only)	**Nexamp (Nexamp FITRe)** www.nexamp.com Tel: 978-688-2700 info@Nexamp.com (used with systems installed by Nexamp only)
Northern Power www.northernpower.com Tel: 877-90-NORTH JLaughlin@northernpower.com (used with wind and fuel cells only)	**Petra Systems** www.petrasystems.com Cell: 732-589-4449 Sean.McKeon@petrasystems.com (used with Petra Systems only)	**Power Factors, LLC** www.powerfactorscorp.com (used with Clean Power Finance systems only)
Solar Data Systems, Inc aka Solar-Log www.solar-log.net Tel: 203-702-7189 reporting@solar-log.com (used with Solar-Log meters only)	**SolarCity** www.SolarCity.com Tel: 1-888-765-2489 ext. 5546 (used with systems installed by SolarCity only)	**Solar Design Associates** www.solardesign.com Tel: 978-456-6855 (used with systems designed by Solar Design Associates only)
Solectria Renewables LLC www.solrenview.com Tel: 978-683-9700 support@solrenview.com sales@solrenview.com (used with Solectria inverters only)	**Sunnova Energy Corporation** www.sunnova.com Tel: 281-985-9900 SRECs@sunnova.com (used with Sunnova related entities and systems only)	**SunPower Corporation** www.sunpower.com Tel: 800-786-7693 (used with SunPower systems only)
SunRun http://www.sunrun.com Tel: 415-580-6881 bshapiro@sunrun.com (used with systems owned by SunRun only)	**Tigo Energy, Inc.** www.tigoenergy.com Tel: 408-402-0802 nsl@tigoenergy.com	**Trinity Solar** www.trinity-solar.com Tel: (732) 780-3779 ext. 9080 Monitoring Dept. Head bob.cortese@trinitysolarsystems.com

US Solar Works, LLC www.ussolarworks.com Tel: 508-226-8001 pete@ussolarworks.com (used with systems installed by US Solar Works only)	**Vivint Solar** www.vivintsolar.com Tel: 877-404-4129 (used with systems installed by Vivint Solar only)	

DISCLAIMER: This directory is for general information and use only. The Massachusetts Clean Energy Center (MassCEC) has not investigated, and expressly disclaims any duty to investigate, any company, product, service, process, procedure, design, or the like, which may be presented on the aforementioned list. The presentation of these companies does not constitute endorsement, warranty, or guaranty, by MassCEC of any company, product, service, process, procedure, design, or the like. The entire risk of any information presented is assumed by the user and MassCEC expressly disclaims any and all liability and responsibility for any action or decision made in reliance on the information contained herein.



Attachment A-2

Attachment B

- PUC 2505.09(i)(1): "[The duties of the independent monitor shall be] to perform an initial inspection of source's meter for accuracy and capability to measure the electricity or useful thermal energy produced, unless the meter is owned by a distribution utility that has already inspected it pursuant to Puc 305."
    - Why this is onerous and inapplicable:
        - Power Factors is a software/IT company. We do not directly employ or contract with field service providers or technicians. Revenue-grade metering equipment is already installed on a site prior to Power Factors contract start date (for existing projects) or is conducted under a separate agreement between our client and their subcontractors (for new projects), completely independent of the contract between Power Factors and our client. Our company provides a service for remote monitoring and independent reporting to owners and third parties and is thus typically never visits client sites.
        - Power Factors is able to achieve our competitive price points due to our high degree of automation and by preferring software solutions over hardware solutions. Lower prices reduce operating expenses for our customers, ultimately reducing the cost of solar power production, increasing asset value, and driving industry growth.
        - Our clients procure revenue-grade equipment with high degrees of measurement accuracy and remote sampling communications protocols demanded by the biggest financiers and banks. The data platforms and communications protocols have been in use for over three decades due to their reliability and bankability. We leverage onsite local (SCADA) networks already procured by our clients that are also held to this high degree of dependency.
        - On-site metering and networking equipment is installed by licensed engineers and electricians and our clients retain the services of field services companies to solve questions only answered by site visits. These field services representatives will make themselves available as needed for meter validation.
    - How the purpose of the rule would be satisfied by alternative methods:
        - Power Factors understands the purpose of this rule is to (a) verify that a meter of a specified model and serial number is actually installed onsite, (b) ensure that meter meets or exceeds certain industry standards regarding accuracy, and (c) validate the data being extracted by that meter via remote monitoring matches the values the meter is reporting locally. Power Factors leverages as-built drawing sets for these purposes that have been through many rounds of validation via numerous independent engineering companies and stakeholders. Project financiers demand metering equipment that meet or exceed the same standards the NH PUC demands. To validate data, we log in directly to onsite SCADA systems and meter interfaces, where applicable, to validate reported results match across all systems.
        - Power Factors has a proven record of correlating a variety of production metrics to analyze plant data, identify outages and de-rates, ensure measurement accuracy, and facilitate asset management. In particular, our customers rely on

the ability to compare actual, measured plant production to secondary data sources like multiple plant meters and inverters and create automatic alerts should discrepancies rise above expected thresholds. We also calculate expected production based on real-time weather data and the ASTM E2848 standards and load customer financial model production data, so customers can easily compare expected, modeled, and actual production to identify and correct inconsistencies. Our combined 100+ years of experience in the solar data space gives us the experience needed to diagnose and drive issue resolution with our clients.