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Advisory Opinion Unit

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STATE OF NEW YORK
COMMISSIONER OF TAXATION AND FINANCE

ADVISORY OPINION PETITION NO. S081208B

Petitioner, [redacted], asks whether the machinery and equipment that comprise its proposed power frequency regulation facility will qualify for the exemptions for machinery and equipment used directly and predominantly in the production of electricity for sale pursuant to sections 1115(a)(12) and 1105-B of the Tax Law. We conclude that the machinery and equipment, as described by Petitioner, do not meet the requirements of sections 1115(a)(12) and 1105-B of the Tax Law. The installations of the equipment may, however, qualify as capital improvements.

Facts

Petitioner designs and develops products and services that support a more stable and reliable electrical grid. An essential element of Petitioner's current project is a flywheel energy storage system it developed and patented that can be used as part of a system to draw electrical energy from the electrical grid that is stored in the form of kinetic energy in a rotating flywheel. Petitioner intends to use its flywheel energy storage system to build a facility that will provide "frequency regulation services" for the electrical grid in New York State.

Generally, the frequency of the alternating current on the electrical grid is maintained at 60 cycles per second ("Hertz"or "Hz"). Deviations from normal grid frequency can damage equipment or devices that obtain power from the grid. Balancing generation and load nearly instantaneously and continuously while maintaining the required frequency is challenging because loads constantly fluctuate (e.g., lights, air conditioners, factories, etc. are randomly turned on and off) and certain generation sources (e.g., wind turbines, solar panels, etc.) constantly fluctuate due to weather. The need to balance electricity supply and demand on the grid requires a special service to maintain stable power frequency. The process whereby adjustments are made to the grid to account for the fluctuating demand and supply is known as a frequency regulation service. The New York Independent Systems Operator (NYISO), the entity responsible for coordinating the generation and transmission of electrical power in this state, provides a market for the submission of bids to provide this frequency regulation service.

Petitioner intends to build a facility using its flywheels that will provide *down regulation* service by absorbing excess energy from the grid and *up regulation* service by returning energy to the grid as needed to maintain the 60 Hz interconnection frequency. The intended site is adjacent to power transmission equipment (a 115 KVA transmission line and a power substation) owned by two independent third party electricity transmission companies. In providing this frequency regulation service, Petitioner will essentially remove electricity produced by other entities from the power grid when there are periods of oversupply, and will use this electricity to power motors that will spin up the flywheels. When electricity is needed by the grid Petitioner will slow the flywheels down, and that action spins a generator that converts the kinetic energy stored by the flywheels back to electrical energy, which is returned to the power grid, thereby assisting the grid in maintaining the necessary 60 Hz. Petitioner estimates that over an extended period, the flywheels will be used less than 50% of the time in providing power back to the power grid. The facility will not use or consume any fuel, and unlike a power plant, which would burn fossil fuels, is generally not subject to regulatory oversight.

The NYISO, with the approval of the Federal Energy Regulatory Commission, recently sought regulatory amendments to create a framework to provide compensation to a facility that stores energy for the purpose of providing a frequency regulation service (like Petitioner's or one that uses batteries). These amendments established a definition of Limited Energy Storage Resource (LESR) for the purposes of integrating facilities similar to Petitioner's into the New York rate structures. Generally, these regulatory amendments place the emphasis on the LESRs provision of regulation service (See FERC order accepting tariff revisions, May 15, 2009). The regulatory action was necessitated by the fact that Petitioner's facility can sustain maximum energy withdrawal or injection for no more than 15 minutes, and therefore Petitioner's facility did not meet the requirements of the rate structure for electricity generators.

Petitioner states that the NYISO will constantly monitor Petitioner's state of readiness to remove power from the grid. Thus, if Petitioner's flywheels are not operating (i.e., spinning) at peak capacity and there is excess electricity in the grid, NYISO will allocate the excess electricity to Petitioner in *down regulation* service. If Petitioner's flywheels are already spinning at peak capacity, NYISO will not require Petitioner to provide *down regulation*. Petitioner is paid via NYISO settlement procedures for agreeing to remove or provide electricity when requested by the NYISO for specific periods of time per day.

Mechanically, Petitioner's facility will consist of 20 pods, with each pod containing 10 flywheels and the associated cooling system, and 10 transformers. Each flywheel consists of a heavy cylinder that spins at high speed (up to 16,000 revolutions per minute) while suspended by a magnetic lift system inside a metal, vacuum-sealed container. The flywheel unit is anchored to and contained within an underground concrete foundation assembly. The ten flywheels are electrically connected to the associated electronics required to operate the flywheels. These electronics are housed in an above-ground container.

The flywheels and the power electronics generate a substantial amount of heat. The cooling system prevents overheating. A "closed loop" system of pipes carries a fluid to the heat source (i.e., the flywheels and power electronics). The temperature of the fluid rises as it absorbs the excess heat. The fluid is then pumped away from the heat source to a cooling system, where the temperature of the fluid is lowered. The cooling system, located in close proximity to each pod, is a fan-driven heat exchanger similar to a radiator. A pump house is responsible for pumping the fluid from the heat source to the cooling system and back.

The transformers collect the low voltage power generated by the pods and convert this voltage to an intermediate voltage level capable of being transmitted to the transmission substation that contains the transmission transformer which is connected to the grid.

Petitioner will form two single-member limited liability companies (Holding LLC and Operating LLC). Petitioner will be the sole member of Holding LLC, which in turn will be the sole member of Operating LLC. Petitioner will sell Operating LLC the flywheels, the concrete containers, and the associated electronics. Operating LLC will purchase the cooling system and pump house from other vendors.

Analysis

Section 1115(a)(12) of the Tax Law provides an exemption for machinery and equipment for use and consumption directly and predominantly in the production of electricity by generating. Section 1105-B of the Tax Law also exempts parts, tools, and supplies used in the production of electricity for sale by generating. Receipts from the services of installing, repairing, maintaining, or servicing such machinery, equipment, parts, tools, and supplies are exempt from the tax imposed on these services under section 1105(c)(3) of the Tax Law (*See* Tax Law section 1105-B(b).)

The threshold determination is whether any of the machinery or equipment installed at Petitioner's facility is used and consumed directly and predominantly in the production of electricity for sale by generating. In general, the production phase of the manufacturing process with respect to the generation of electricity for sale is considered to end at the generator that produces the electricity. *See Niagara Mohawk Power Corporation v Wanamaker*, 286 App Div 446, *affd* 2 NY2d 764; *ABB Power Transmission, Inc*., Adv Op Comm T&F, July 17, 1990, TSB-A-90(34)S; *Conti Enterprises, Inc.*, Adv Op Comm T&F, September 27, 2005, TSB-A-05(35)S. However, the determination as to whether a particular piece of machinery qualifies for the exemption depends upon the particulars of a taxpayer's operation and must be individually assessed on its own fact pattern (*Matter of Rochester Independent Packer, Inc.* v. *Heckelman*, 83 Misc 2d 1064, 374 NYS2d 991, 993).

Petitioner's "flywheel frequency regulation" facility is designed to support more stable, reliable, and efficient electricity grid operation. Essentially, Petitioner's power frequency regulation facility removes electricity from the electrical grid when there is a surplus. The energy removed from the grid is stored mechanically in the rotation of the spinning flywheels. If the frequency of the power grid drops below the required threshold, the NYISO may ask Petitioner to provide electricity back to the electrical grid. Petitioner describes its "frequency regulation service" as "energy storage-based regulation technology." In other words, Petitioner removes power generated by other parties from the grid so that it can store that electricity for use in maintaining the frequency of the electrical grid in the event of a power fluctuation. A frequency regulation facility could use batteries to provide essentially the same function, but Petitioner hopes that its flywheel facility will be far more environmentally friendly and economically feasible.

As Petitioner's facility did not fit into the overall tariff scheme as a generator, the NYISO sought regulatory amendments with the Federal Energy Regulatory Commission for approval for tariffs for Limited Energy Storage Resources (LESR). The tariff amendments were approved on May 15, 2009. As a storage resource, Petitioner's activity seems best described as part of the transmission or distribution process rather than as a production activity (20 NYCRR 528.13(b)(1)(iii)). Petitioner is merely storing electricity generated by other entities until the NYISO requests that Petitioner provide it back to the electrical grid. Unlike a facility that uses fossil fuels, wind, or some other form of power generation, Petitioner's facility is capable of providing energy, and therefore its regulation service, only to the extent it has previously removed and stored electricity from the power grid. Petitioner itself describes the provision of the energy output as incidental to the provision of the regulation service. If withdrawn at the maximum rate, Petitioner's facility can continuously supply power to the grid for only 15 minutes without shutting down. Due to the limited ability to supply energy to the grid, a LESR is considered, under the tariff approved by the FERC on May 15, 2009, to be a "regulation-only" supplier of electricity, and is therefore not deemed to be in the same category as generation facilities which are otherwise required to supply energy to the grid in full hour time blocks.

Even if Petitioner's facility could be considered a generation facility, Section 1115(a)(12) of the Tax Law requires that the machinery and equipment be used directly and predominantly (more than 50% use) in the production of electricity for sale by generating. Since Petitioner estimates that over an extended period of time, the machinery and equipment will be used less than 50% of the time in returning power to the electrical grid, the use of the machinery and equipment fails the predominant-use test for the exemption.

Based on these facts, it is concluded that the flywheels are not used directly and predominantly in the production of electricity for sale by generating. Accordingly, the purchase or use of the flywheels and related machinery or equipment is subject to sales or use tax under Tax Law §§ 1105(a) and 1110, unless otherwise exempt. Generally, the sales tax is computed on the price paid for an item or service, including any shipping or handling charges made by the vendor. But if the machinery or equipment (such as the pods) is used outside New York State for over six months before its first use in the state, the use tax is based on the

current market value of the property (not to exceed its cost) at the time of first use within New York (*See* §1111(b)(1) of the Tax Law).

To the extent that non-exempt tangible personal property is installed into real property owned by Petitioner (i.e., not leased property), charges for the installation of this property may qualify for exemption from tax under Tax Law section 1105(c)(3)(iii) as installations of tangible property that become a capital improvement. The term "capital improvement" is defined in Tax Law section 1101(b)(9)(i) as an addition or alteration to real property that: (1) substantially adds to the value of the real property, or appreciably prolongs the useful life of the real property; (2) becomes part of the real property or is permanently affixed to the real property so that removal would cause material damage to the property or article itself; and (3) is intended to become a permanent installation. Whether a particular installation qualifies as a capital improvement to real property can be determined only by examining the facts and circumstances of that particular installation. Such a determination is beyond the scope of this Advisory Opinion.

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/S/
Jonathan Pessen
Director of Advisory Opinions
Office of Counsel

NOTE: An Advisory Opinion is issued at the request of a person or entity. It is limited to the facts set forth therein and is binding on the Department only with respect to the person or entity to whom it is issued and only if the person or entity fully and accurately describes all relevant facts. An Advisory Opinion is based on the law, regulations, and Department policies in effect as of the date the Opinion is issued or for the specific time period at issue in the Opinion.