



Feature

The value of small hydro

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On the basis of research and a review of the published technical and professional literature, Roger H Bezdek and Robert M Wendling derive a number of significant conclusions concerning the proper valuation of small hydroelectric facilities in the US Northeast

THERE currently exists a difference of opinion between local municipalities and utility companies as to the appropriate value for purposes of property tax assessment of small hydroelectric facilities in New York State and throughout the Northeast. For example, New York and Niagara Mohawk Power Corporation (NiMo) and Erie Boulevard Hydropower, L.P. (Erie) contend that in recent years, the assessed values of some of these facilities should be considerably less than the values at which towns have been assessing them.

This paper examines the issues involved in determining the existence of a market for small hydroelectric facilities in the Northeast over the past five years. It determines that there are a number of compelling reasons why, given the current and impending circumstances, small hydro facilities are attractive, valuable assets whose values will increase in the future.

The authors caution against making valuation decisions relating to any particular hydroelectric facility's market value on the basis of the research summarised here. This is not the intent, and individual facility conclusions cannot and should not be drawn from this paper. Rather, findings are presented which indicate that there exists research and market experiences that are known and that should be considered in the valuation decision.



View of Spier Falls power house



View of Spier Falls hydro facility

Absence of a market

Lack of a market for hydroelectric facilities in the Northeast

Traditionally, hydro facilities have been valued on a reproduction cost new less depreciation (RCNLD) basis in New York state because they have been deemed to be 'specialty' properties, but the argument is currently being made that deregulation has created a market for generating facilities and they no longer meet the definition of a specialty. However, the authors research has documented that in the late 1990s and the early years of the current decade the so-called 'market' was at best immature and evolving and lacked adequate information.

For example, it was found that, first, virtually all of the reported sales were engendered by the Federal Energy Regulatory Commission (FERC) Order 888 and state PSC rulemaking which required the unbundling of generation assets. Accordingly, they were not actual 'arms length' transactions. Second, most of the sales that occurred were of numerous plants and are better characterised as 'enterprise' or business purchases rather than real estate acquisitions. Third, the market for electricity in the Northeast was (and is) undergoing fundamental change and there were limited and insufficient market price data available to use in valuing hydroelectric generation facilities. Further, at least some of the 'sales' over this period were forced divestitures which the seller was required to complete by a specified deadline.

A basic methodology used by appraisers in evaluating a market is a comparable sales analysis. However, the authors research indicates that such an analysis cannot be performed because the data surrounding these so-called 'sales' is proprietary, confidential, and cannot be accessed. More importantly, it was found that there have been very few sales of truly comparable properties over this period – a true comparable facility would be a stand-alone hydroelectric facility with the same or similar transmission constraints as the subject property.

There exist numerous authoritative sources and studies published in the late 1990s and the early years of the current decade documenting the points made above and the fact that a true market for these hydroelectric facilities did not exist. Below the authors present a summary of some of these.

Empirical Research

1997 Public Utilities Fortnightly paper

In a 1997 article published in Public Utilities Fortnightly, Jeffrey Price analysed the factors affecting the value of power plants in a deregulated environment.¹ He concluded that proper valuation was extremely difficult because of the unsettled market – a condition that was likely to persist for some time. He found that: i) The information and experience required to develop a coherent view of the market do not exist; ii) Purchasers of power plants will be 'flying blind' with respect to the prices paid for generating assets; and iii) The current 'market' was unsustainable and it was unclear when the market would reach long-term equilibrium. For the foreseeable future the

outlook was for uncertainty, volatility, and cyclical price instability.

1998 US Generating Company assessment

In 1998, USGenNE prepared an analysis of the valuation of hydroelectric facilities in New England for the state of Vermont.ⁱⁱ This analysis concluded that the market approach is not valid because there are no reliable comparable sales data available.

USGenNE found that, 'While there have been recent sales of hydroelectric facilities in New England, to compare them actually raises more questions than answers. For example, is a hydroelectric facility located in an area where it is difficult to import electricity due to a transmission constraint and where a premium is paid for 'green power' more valuable than a hydroelectric facility found elsewhere? Similarly, is a hydroelectric facility used to provide electricity at periods of peak usage more valuable than a run-of-river facility, the output of which depends solely on river flow? And, is the price paid when an entire fleet of hydroelectric facilities is sold along with numerous other fossil assets comparable to the price paid for a single hydroelectric facility in a sale of just that facility?''ⁱⁱⁱ

Other relevant findings contained in this analysis include: i) it is not clear whether or to what extent a vibrant, competitive retail market for hydro facilities will actually develop throughout New England, and ii) there are no current data available upon which to measure the value of a hydroelectric facility because both wholesale and retail markets are evolving.

1998 Public Utilities Fortnightly paper

In a 1998 article published in the Public Utilities Fortnightly, Steven Schneider assessed the major factors likely to influence the assessed values and property taxes of power plants under deregulation.^{iv} He found that the market was in flux and that it was thus difficult to properly assess the value of generating assets. In particular, the use of 'comparable sales' data was not legitimate because sales are likely to include the prices for power purchase agreements, stranded cost recovery rights, other intangible contract rights, indemnification for various liabilities, other environmental liabilities, and other assets or costs not directly related to the tangible taxable property.

1998 Burak Anderson & Melloni analysis

In 1998 Jon Anderson of Burak Anderson & Melloni reviewed the state-of-the-art for appraising hydroelectric projects and discussed pending factors that may change these valuations.^v His analysis found that the market-based comparable sales approach could not be used for hydroelectric projects because there were so few fair market value sales. Specifically: 'The comparable sales approach is useless because there are few, if any, sales. Moreover, the introduction of competition to the energy supply is unlikely to create a market for transmission and distribution systems, as little change in the regulatory regime is anticipated.'^{vi} The author also found that, due to their complexity, hydroelectric valuation cases can take several years to resolve.

1998 US Generating Company testimony

In 1998 testimony before the Vermont Department of Taxation, USGenNE stated that a viable market for hydroelectric facilities in the Northeast did not exist.^{vii} It testified that valuation was difficult due to '...issues associated with market uncertainties and the need to forecast and interpret a market that has not yet formed over an extended period of consideration.'^{viii} (emphasis in original testimony).

1999 valuation of hydroelectric facilities report

In 1999, the Vermont Department of Taxes and the Vermont Department of Public Services, at the direction of the state legislature, conducted a comprehensive analysis of the appraisal of hydroelectric facilities in the state, their values, and the appraisal methods used in establishing their values.^{ix} The analysis concluded that a true market for small hydroelectric facilities in the Northeast did not exist and that adequate market data are lacking.

Specifically, it found that, first, the markets in New England are undergoing a fundamental change. Until this momentous activity settles down somewhat and regional market experience is gained, there will be limited market price data to use in valuing hydroelectric generation resources. Second, it will be some time before an accurate picture of market prices will develop and, for this reason, any valuation approach based on market prices will suffer from lack of data. Third, appraisals of hydroelectric facilities in a deregulated environment are difficult because the deregulated environment is new and the data that appraisers require to make defensible appraisals are presently in the development stage. Fourth, many of the recent sales of hydroelectric facilities in New England were made under conditions of an administratively fixed 'standard offer' which are below the market price and thus do not represent true market prices. Finally, the market sales data proved by USGenNE are suspect because: i) The sale was a forced divestiture which NEES was required to complete by a deadline; ii) the nature of the divestiture resulted in USGenNE becoming responsible for providing power at a 'standard offer' for a period of time and absorbing other obligations which lowered the total price paid; iii) the company allocated a large portion of the purchase price to intangible assets; and iv) there are unresolved questions regarding the allocation among the purchased facilities.

1999/2000 Real Estate Issues paper

In the Winter 1999/2000 issue of Real Estate Issues, William Kinnard Jr. and Gail Beron examined the effects of electricity market deregulation on local property tax assessments.^x The authors determined that a market approach to hydroelectric facility valuation was difficult because an appropriate market did not exist. They reported that few 'clean' sales of the tangible real property and personal property of electricity generating plants have been reported. Nearly all include acquisitions of fuel contracts, power purchase contracts with the selling IOU (some of which are long term, fixed-price contracts), employment guarantees for existing plant personnel, and other intangible, non-reality assets.

Due to the unsettled market factors, they concluded that there will continue to be considerable debate between taxpayers and assessors over the allocations of sales prices to taxable property.^{xi} In particular, there will be major arguments over the extent to which reported sales prices reflect nontaxable, intangible assets. They also note that market valuation is difficult because relatively few appraisers are sufficiently familiar with the data and information on wholesale and retail electricity markets and with the functioning of markets for generating plants.

2002 Moreau Hydroelectric Facilities report

In August 2002, MR Valuation Consulting conducted a comprehensive appraisal of three hydroelectric facilities near Moreau, New York – Spier Falls hydroelectric facility (Spier Falls), the Sherman Island hydroelectric facility (Sherman Island), and the Feeder Dam hydroelectric facility (Feeder) – and found that adequate information does not exist to accurately evaluate comparable sales data relating to hydroelectric facilities.^{xii} This appraisal stated that 'Based on uncertainty and specificity of information available (as well as our inability to make reasonable judgments in the absence of needed information) the sales comparison method is not reliable under the given facts and circumstances of the market for generating facilities.'^{xiii}

It found that confidentiality provisions and non-full disclosure of sale terms prevented the adjustment of comparable sales to make an adequate comparison. The available market transactions for generation facilities include portfolio sales of mixed generation assets (e.g. hydroelectric, fossil fuel, and/or nuclear), and purchasers are buying more than the physical assets. These generation facilities may include intangible values (i.e. PPAs, location, future development potential, etc.)^{xiv}

The authors concluded that, 'Due to confidentiality provisions and non-full disclosure of terms, as well as mixed portfolios of assets that were sold, and the inability to separate out real property values from personal or intangible assets, the sales data to date does not allow for a reliable sales comparison approach.'^{xv} Thus, 'the sales comparison approach is not reliable due to the lack of available specific information on the sales of any particular group or individual generating sites, and the inability to make required adjustments.'^{xvi}

Other studies confirming the lack of an adequate market

Other studies have also confirmed the lack of an adequate market for hydroelectric facilities and the absence of the necessary information to support such a market. Some of these are briefly summarised below. In 1998, an article in Inside Energy found that the 'market' for electric generation assets was puzzling, fluid, dynamic, and unsettled and that it may take 10 years for the market to be defined.^{xvii} In such an environment, buyers and sellers have few clues as to the actual economic value of generating assets. It quoted the Electric Power Supply Association as stating that the unsettled market and lack of necessary information was 'alarming'.

In 1999, an article in the Northeast Power Report noted that the market for hydroelectric plants in the Northeast was 'difficult' because the hydro plants were being

valued very highly. Importantly, it found that the necessary information was not available because the financial terms of the transactions were not being disclosed.

In 1999, the Vermont Hydropower Coalition noted that the market approach to valuing hydro facilities was inappropriate, since it required the use of (often unattainable) proprietary, highly sensitive information and because there is no basis to assume that the current unstable electric energy markets will stabilise.^{xx}

In 1999, an article in *Public Utilities Fortnightly* found that a true competitive market for electricity in the Northeast had yet to develop, and that current indicators were confusing, counterintuitive, and contradictory.^{xxi} Specifically, it stated that the market in the Northeast was 'immature'.

In 2000, an article in *Electric Utility Week* discussed the difficulty of determining the property tax valuations for electric generation assets due to the lack of adequate market information.^{xxii} Specifically, it noted that correct evaluations were nearly impossible because there were no other comparable sales.

In 2000, an article in the *Electricity Journal* found that deregulation was changing the market for hydroelectric facilities, but that it was unclear precisely how or when the new market would emerge.^{xxiii} Due to rapidly changing market conditions and lack of information, it recommended development of sophisticated modelling and Monte Carlo estimation techniques.

In 2002, an article in the *Morning Sentinel* discussed the difficulties of properly valuing a small hydroelectric facility in Maine due to the lack of adequate market data.^{xxiv} It noted that confidentiality concerns precluded obtaining the necessary financial data.

Rigorous assessments of the value of hydroelectric facilities

A review of the professional and technical literature indicates that in the era of deregulation, small hydroelectric facilities, such as many of those in New York State and the Northeast, are likely to be of increased value. Several of these studies are discussed here.

July 1997 decision focus report

A July 1997 study by Decision Focus, Inc. found that, due to their lower fuel costs, hydroelectric plants will be more valuable assets than gas or oil-fired units once generation is deregulated.^{xxv} The study found that, because of their lower operating costs, hydro plants can operate profitably more of the time. As electricity becomes more of a commodity, the profitability of power plants will increasingly be determined by the spot market price of power. In a free market environment, spot power prices are likely to swing dramatically with the time of day, the season, and the demand for power itself.

According to economic theory, the spot price will rise just high enough to bring into production enough generating capacity to meet demand. Therefore, at any given time, those generating units with variable costs below the spot price will be profitable to

operate, while those with variable costs greater than the spot price will not. Low operating-cost units will not only be dispatched more frequently than units fired by expensive fuels, but they will also generate more profits every hour that they are on-line. Existing hydro plants – many of which were built when construction costs were considerably lower than they are today – have been well depreciated and should prove to be very profitable.

1998 Resource Data International study

A 1998 study by Resource Data International, Inc. found that the 1997 round of Environmental Protection Agency air quality regulations and proposals will have a profound impact on the US electric utility industry, including dramatic changes in asset values.^{xxvi} Asset value increases of up to 40% and decreases up to 76% are possible, depending critically upon the future price of natural gas. RDI concludes that 'As power market deregulation and environmental regulation move forward, some plants and utilities will gain in value while others will decline. Downward pressure on power market prices under deregulation will be reeled back by upward pricing pressure under environmental regulation'. Overall, the study finds that fossil-fired steam plants will lose value, while hydroelectric plants will gain value. In particular, since some large hydro plants face heavy relicensing costs, small, low-head hydro plants will likely gain the most in asset value.

To determine the extent of these competing impacts, RDI used its 'Inter-Regional Electric Market Model'. Another major finding was that while increased gas demand from environmental initiatives will have a strong effect on gas prices, the larger uncertainty of the natural gas industry's ability to meet demand under business-as-usual conditions may pose a greater risk to utilities.

1998 Schneider Study

In March 1998, Steven Schneider assessed the major factors likely to influence the assessed values and property taxes of power plants under deregulation.^{xxvii} One of the most important factors he identified was the prospect of new environmental legislation and regulation that, coupled with deregulation, means the end of the captive market (ratepayers) through which to recover any required compliance or abatement costs. Hydroelectric power plants are especially attractive, since (unlike fossil and nuclear plants) they produce no air pollution, solid waste, or hazardous waste.

This is important because in a competitive market the cost of environmental compliance will decrease income, as it can no longer be included in rate base or regulated cost of services. The property values of fossil and nuclear plants with environmental compliance liabilities will fall, while the property values of plants without such liabilities – such as small hydroelectric facilities – will increase. Schneider notes that, while these factors will affect future adjustments in tax assessments, they also affect investor expectations and hence current value. Buyers and sellers look to the future; they discount the present value of assets to reflect expectations.

1998 Salpukas Study

In a 1998 assessment of hydroelectric facilities under deregulation, Agis Salpukas summarised the advantages of these plants.^{xxviii} First, electricity producers around the country want the flexibility offered by hydroelectric plants, and this tends to increase the desirability and value of these facilities. Second, hydro has a retail advantage in that it produces 'green power', and Salpukas notes that many customers are paying 20 percent more for such power. Finally, he interviewed utility executives who listed the advantages of hydroelectric facilities: They consume no fuel, produce no pollution, require little staffing and maintenance, and are generally built to last. He quotes utility executives who contend that small hydro facilities in the Northeast developed during the 1920s have become 'gold mines'.

1999 Kinnard and Beron Study

A 1999 study by William Kinnard, Jr., and Gail Beron concluded that changes in electric generating plant values will have strong impacts on local government revenues and fiscal policies, and that hydroelectric facilities are increasing in value relative to gas-fired plants.^{xxix} They found that hydroelectric generating capacity is increasing in value because its operating expenses are extremely low. On the other hand, natural gas-fired plants have decreased in value, in large part because their fuel costs have been increasing in recent years – reflecting increased demand for natural gas, especially from new construction. During 1997 and 1998, the authors found that hydro facilities tended to increase in value.

The authors also noted another factor tending to increase the value of existing hydroelectric facilities: The development of new hydro facilities faces potentially insurmountable regulatory barriers and opposition from environmental groups. Thus, hydro facilities will, on average, likely be assessed and taxed at somewhat higher levels than would be associated with valuation through net book value. Importantly, Kinnard and Beron concluded that, on average, under deregulation the new owner-operators of hydro facilities will likely face higher assessments, and pay more property taxes, than did the former IOU owners when assessments were based on book values.

July/August 2001 issue of Power Magazine

A special report and cover story in the July/August 2001 issue of Power magazine focused on the increased interest in and value of hydroelectric plants due to high natural-gas prices, regional electricity shortages, and new technologies that increase performance and mitigate environmental impact.^{xxx}

The report noted that many public and private sector entities are seeking ways to add incremental hydro power to existing projects. The average age of US hydro facilities is over 50 years, making them ripe for life extension, rehabilitation, and upgrading. Through application of current technologies, operating efficiencies can be increased by 5% or more, and capacities can be increased by 20% or more – typically with a capital investment of US\$200 to US\$400/kW.

The combination of licensing challenges and market conditions have spurred hydro power owners and developers to take a closer look at small, micro, and incremental generation projects. FERC, in a March 2001 mailing to over 300 hydro power owners, signaled its support for the development of incremental resources. Given the lengthy and contentious regulatory process of hydro licensing, this indication of regulatory support is highly encouraging for the industry. A number of major developers are working on a variety of incremental resource projects – including adding new units to existing dams.

July 2002 C.H. Guernsey & Co. Study

A July 2002 study by C.H. Guernsey & Co. found that generation buyers in the restructured market are placing a premium on small hydro power plants because they believe them to be less risky and better able to respond to changing market conditions.^{xxx} The findings contradict the long-accepted belief regarding the benefits associated with economies of scale, or bigger-is-better, in power generation.

In the current, less regulated power market, there is less risk and a perceived advantage in having multiple, smaller plants in order to be able to respond to market conditions. Suppliers believe that to take advantage of the market it is better to have a number of smaller plants that can be quickly turned on and off dispersed throughout a region. Although the engineering benefits of size, or the efficiencies of larger scale production, are still inherent in the plants, the market valuation indicates that there are benefits from smaller units that often outweigh those efficiencies.

Conclusions

On the basis of research and a review of the published technical and professional literature, the authors derived a number of significant conclusions concerning the proper valuation of small hydroelectric facilities in New York.

Most importantly, it was concluded that during the late 1990s and early years of the current decade the market for these facilities was at best immature and evolving and lacked adequate information. This conclusion is supported by numerous analytical studies and research reports conducted over the past five years, which verified that:

- Most of the sales that occurred were of numerous plants and are better characterised as 'enterprise' or business purchases rather than real estate acquisitions.
- The market for electricity in the Northeast was (and is) undergoing fundamental change and there were limited and insufficient market price data available to use in valuing hydroelectric generation facilities.
- At least some of the 'sales' over this period were forced divestitures which the seller was required to complete by a specified deadline.
- Many of the recent sales of hydroelectric facilities were made under conditions of an administratively fixed 'standard offer' which are below the market price and thus do not

represent true market prices.

- There are insufficient current data available upon which to measure the value of a hydroelectric facility because both wholesale and retail markets are evolving.
- Confidentiality provisions and non-full disclosure of sale terms prevented the adjustment of comparable sales to make an adequate comparison – such an analysis cannot be performed because the data surrounding these ‘sales’ is proprietary, confidential, and cannot be accessed.
- The available market transactions for generation facilities include portfolio sales of mixed generation assets (e.g. hydroelectric, fossil fuel, and/or nuclear), and purchasers are buying more than the physical assets. These generation facilities may include intangible values (i.e. PPAs, location, future development potential, etc.).
- Nearly all of the transactions include acquisitions of fuel contracts, power purchase contracts with the selling IOU (some of which are long term, fixed-price contracts), employment guarantees for existing plant personnel, and other intangible, non-reality assets.

A review of the professional and technical literature indicates that in forthcoming era of deregulation, small hydroelectric facilities are likely to be of increased value. For example, research studies have found that:

- Due to their lower fuel costs, hydroelectric plants are more valuable assets than gas or oil-fired units under deregulation.
- EPA air quality regulations and proposals will decrease the value of fossil-fired steam plants, but increase the value of hydroelectric plants.
- Electricity producers desire the flexibility offered by hydroelectric plants.
- Hydroelectric generating capacity is increasing in value because its operating expenses are low.
- There is increased interest in hydroelectric plants due to high natural gas prices, regional electricity shortages, and new technologies that increase performance and mitigate environmental impact.
- Generation buyers in the restructured market prefer small hydropower plants because they are less risky and better able to respond to changing market conditions.

Finally, we must again emphasise that this paper does not purport to derive conclusions with regard to any particular facility’s appropriate market value. It is not the intent that conclusions regarding individual facility valuations should be drawn from the results reported here. Market value opinions must be based on specific property and analysis and the circumstances that constitute that property’s physical and economic composition.

Nevertheless, while the authors do not contend that the research reported here is comprehensive or definitive with respect to the appropriate valuation of small hydroelectric facilities in the Northeast, it does indicate that, contrary to what some utility companies contend, these may be valuable assets whose value will increase with deregulation. As noted, research findings and examples of actual market experiences are presented which are known and that should be considered.

Table 1: Summary of selected recent sources documenting the absence of a true market and the lack of adequate market data for small hydroelectric facilities in the Northeast

Year	Study/Source	Author	Major Findings Derived
1997	Article in the Public Utilities Fortnightly,	Jeffrey Price	Proper valuation is extremely difficult because of the unsettled market – a condition that is likely to persist for some time; the information and experience required to develop a coherent view of the market do not exist.
1998	U.S. Generating Company Assessment	U.S. Generating Company	Market approach is not valid because there are no reliable comparable sales data available. It is not clear whether or to what extent a vibrant, competitive retail market for hydro facilities will actually develop in New England; there are no current data available upon which to measure the value of a hydroelectric facility because both wholesale and retail markets are evolving.
1998	Article published in the Public Utilities Fortnightly	Steven Schneider	The market is in flux and it is thus difficult to properly assess the value of generating assets. The use of “comparable sales” data is not legitimate because sales are likely to include the prices for power purchase agreements, stranded cost recovery rights, other intangible contract rights, indemnification for various liabilities, other environmental liabilities, and other assets or costs not directly related to the tangible taxable property.
1998	Analysis prepared by Burak Anderson & Melloni	Jon Anderson	The market-based comparable sales approach cannot be used for hydroelectric projects because there are so few fair market value sales; the comparable sales approach is useless because there are few, if any, sales. The introduction of competition to the energy supply is unlikely to create a market for transmission and distribution systems, as

			little change in the regulatory regime is anticipated.
1998	Article in Inside Energy	Inside Energy	The “market” for electric generation assets is puzzling, fluid, dynamic, and unsettled and it may take 10 years for the market to be defined. In such an environment, buyers and sellers have few clues as to the actual economic value of generating assets. The Electric Power Supply Association feels that the unsettled market and lack of necessary information is “alarming.”
1998	Testimony	U.S. Generating Company	A viable market for hydroelectric facilities in the Northeast does not exist. Valuation is difficult due to issues associated with market uncertainties and the need to forecast and interpret a market that has not yet formed over an extended period of consideration. (emphasis in original testimony)
1999	Valuation of Hydroelectric Facilities Report	Vermont Department of Taxes and the Vermont Department of Public Services	A true market for small hydroelectric facilities in the Northeast does not exist and adequate market data are lacking. Markets are undergoing a fundamental change, and it will be some time before an accurate picture of market prices will develop. Recent sales of hydroelectric facilities were made under conditions of an administratively fixed “standard offer” which are below the market price and thus do not represent true market prices.
1999	Article in the Northeast Power Report	Northeast Power Report	The market for hydroelectric plants is “difficult” because the hydro plants are being valued very highly. The necessary information is not available because the financial terms of the transactions are not being disclosed.
1999	“Hydroelectric Facility Valuations”	Vermont Hydropower Coalition	The market approach to valuing hydro facilities is inappropriate, since it requires the use of (often unattainable) proprietary, highly sensitive information and because there is no basis to assume that the current unstable electric energy markets will stabilize.
1999	Article in the Public Utilities Fortnightly	Bruce Radford	A true competitive market for electricity in the Northeast has yet to develop, and current indicators are confusing, counterintuitive, and contradictory; the market in the Northeast is “immature.”

2000	Winter 1999/ 2000 issue of Real Estate Issues	William Kinnard Jr. and Gail Beron	A market approach to hydroelectric facility valuation is difficult because an appropriate market does not exist. Few “clean” sales of the tangible real property and personal property of electricity generating plants have been reported. Nearly all include acquisitions of fuel contracts, power purchase contracts with the selling IOU (some of which are long term, fixed-price contracts), employment guarantees for existing plant personnel, and other intangible, non-reality assets.
2000	Article in Electric Utility Week	Electric Utility Week	Determining the property tax valuations for electric generation assets is difficult due to the lack of adequate market information; correct evaluations are nearly impossible because there are no other comparable sales.
2000	Article in the Electricity Journal	Rajat Deb	Deregulation is changing the market for hydroelectric facilities, but it is unclear precisely how or when the new market would emerge. Due to rapidly changing market conditions and lack of information, development of sophisticated modeling and Monte Carlo estimation techniques are recommended.
2002	Appraisal Report – Certain Hydroelectric Assets in Moreau, New York	MR Valuation Consulting	Adequate information does not exist to accurately evaluate comparable sales data relating to hydroelectric facilities, and the sales comparison method is not reliable. Confidentiality provisions and non-full disclosure of sale terms prevent the adjustment of comparable sales to make an adequate comparison. Due to confidentiality provisions and other factors, the sales data to date does not allow for a reliable sales comparison approach.
2002	Article in the Morning Sentinel	Colin Hickey	Properly valuing a small hydroelectric facility in Maine is difficult due to the lack of adequate market information; confidentiality concerns precluded obtaining the necessary financial data.
Source: Management Information Services, Inc., 2005			

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ⁱ Jeffrey P. Price. "What's a Power Plant Worth?" Public Utilities Fortnightly, September 15, 1997, pp. 38-41.

ⁱⁱ "Comments of U.S. Generating Company on the Methodology for Valuation of Hydroelectric Generating Facilities," November 1, 1998.

ⁱⁱⁱ Ibid., p. 9.

^{iv} Steven P. Schneider, "Evaluating Power Plant Property Taxes Under Deregulation: Discounting Value for Restructuring, Technology, and Environmental Compliance," Public Utilities Fortnightly, March 1, 1998, pp. 32-36. Interestingly, Schneider quotes a landmark case where the New York State Supreme court ruled that, because there was no "market" for the locally assessed portion of a gas system (i.e., the sales comparison or market approach was inapplicable), it would value reproduction cost with some very limited obsolescence deductions.

^v Jon Anderson, "Hydroelectric (and Other Electric) Facilities," Burak Anderson & Melloni, PLC, Burlington, Vermont, January 1999.

^{vi} Ibid., p. 3.

^{vii} Testimony of U.S. Generating Company Before the Vermont Department of Taxation at a Public Hearing on Hydro Tax Assessment Methodology, October 13, 1998.

^{viii} Ibid.

^{ix} Vermont Department of Taxes and the Vermont Department of Public Services, Valuation of Hydroelectric Generating Facilities Report, Report to the General Assembly, January 1999.

^x William N. Kinnard, Jr. and Gail L Beron, "The Effects of Electricity Market Deregulation on Local Property Tax Assessments and Fiscal Stability," Real Estate Issues, Winter 1999/2000, vol. 24, No. 4, pp. 17-22.

^{xi} This has certainly turned out to be the case. Over the past decade, generating companies throughout the Northeast have been attempting to drastically reduce the assessed valuations of their acquired hydroelectric facilities on the basis that the "market value" of these facilities is relatively low. However, such attempts have been

successfully challenged. For example, Consumers Energy, the current owner of the 4.3 MW hydroelectric project on the Sebasticook River in Benton, Maine contended that the correct assessed value of the facility should be \$2.5 million. The Town of Benton hired an independent assessor to reassess the property, and he determined that the actual assessed value was \$5.5 million. Based on this estimate, the Town agreed to assess the property at \$4.8 million for the 2002 tax year – nearly twice the value that Consumers Power claimed. (Information obtained from discussions with the Benton Assistant Town Clerk, October 2002) In other cases, demands by power companies for greatly reduced hydroelectric facility assessments ended when towns threatened to condemn the properties and assume control of the power generating facilities themselves, as in the case of Littleton, New Hampshire. When New England Power Company (NEPCO) subsidiary US Generating/New England requested substantial reductions in the assessed value of a small hydroelectric facility, the town leaders threatened to apply for the license to operate the property themselves. Since Littleton has experience running a power company -- the Littleton Water and Light Company, NEPCO viewed the threat as serious. (Information obtained from discussions with Jason Hoch, Littleton Assistant Town Manager, October 2002).

^{xii} MRV Valuation Consulting, LLC. Appraisal Report – Certain Hydroelectric Assets in Moreau, New York, Woodbridge, New Jersey, August 30, 2002.

^{xiii} Ibid., p. 40.

^{xiv} This finding is corroborated by the actual experience with similar hydroelectric facilities in the Northeast. For example, ownership of the power plants that had been owned by the Great Northern Paper Company in northern Maine was transferred to Great Lakes Hydro America (GLHA), a wholly owned subsidiary of Brascan Power Corporation, a Brazilian/Canadian joint-venture headquartered in Toronto. The new owners, GLHA, assumed control of the plant providing power to the Town of Millinocket, Maine in early 2002 and are currently being assessed at the same level as the previous owners. However, with the assistance of an independent appraiser, the Millinocket Board of Assessors determined that when the hydropower facilities are evaluated as a separate entity, as opposed to being a component in the total assets of Great Northern Paper, their value is even greater. As a result, Millinocket is now considering increasing the assessed value of the hydroelectric facilities. (Information obtained from conversations with Michael Noble, Millinocket Assessor, October 2002).

^{xv} MRV Valuation Consulting, LLC, op. cit., pp. 134-135.

^{xvi} Ibid., p. 135.

^{xvii} "Power Companies Scramble to Buy Plants as Utilities Divest Generation Assets," Inside Energy, Vol. 26, No. 16, April 20, 1998.

^{xviii} "Fortis to Buy Two Hydroelectric Plants in New York State; Eyes Merchant Sales," Northeast Power Report, October 22, 1999.

^{xix} Another reason for the lack of data is that towns in the Northeast currently in the middle of litigation with respect to the value of small hydroelectric facilities are reluctant to provide documentation. (Information obtained in discussions with Richard Partridge, Winslow, Maine Town Assessor, and William Hayden, Tax Analyst with the Vermont Department of Taxation, October 2002).

^{xx} Vermont Hydropower Coalition, "Hydroelectric Facility Valuations," Montpelier, Vermont, January 1999.

^{xxi} Bruce W. Radford, "Let's Go Shopping; But Does Anyone Know the Real Price of Power?" Public Utilities Fortnightly, November 15, 1999, pp. 4-6.

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