

**Final Application for New License for Major Water Power
Project – Existing Dam**

Northfield Project

Northfield Mountain Pumped Storage Project (FERC Project Number 2485)

Turners Falls Hydroelectric Project (FERC Project Number 1889)

EXHIBIT D – STATEMENT OF COST AND FINANCING

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EXHIBIT D – STATEMENT OF COSTS AND FINANCING

The following excerpt from the Code of Federal Regulations (CFR) at 18 CFR § 4.51 (e) describes the required content of this Exhibit.

- (e) *Exhibit D is a statement of costs and financing. The statement must contain:*
- (1) *If the application is for an initial license, a tabulated statement providing the actual or approximate original cost (approximate costs must be identified as such) of:*
 - (i) *Any land or water right necessary to the existing project; and*
 - (ii) *Each existing structure and facility described under paragraph (b) of this section (Exhibit A).*
 - (2) *If the applicant is a licensee applying for a new license, and is not a municipality or a state, an estimate of the amount which would be payable if the project were to be taken over pursuant to section 14 of the Federal Power Act upon expiration of the license in effect [see 16 U.S.C. 807], including:*
 - (i) *Fair value;*
 - (ii) *Net investment; and*
 - (iii) *Severance damages.*
 - (3) *If the application includes proposals for any new development, a statement of estimated costs, including:*
 - (i) *The cost of any land or water rights necessary to the new development; and*
 - (ii) *The cost of the new development work, with a specification of:*
 - (A) *Total cost of each major item;*
 - (B) *Indirect construction costs such as costs of construction equipment, camps, and commissaries;*
 - (C) *Interest during construction; and*
 - (D) *Overhead, construction, legal expenses, taxes, administrative and general expenses, and contingencies.*
 - (4) *A statement of the estimated average annual cost of the total project as proposed specifying any projected changes in the costs (life-cycle costs) over the estimated financing or licensing period if the applicant takes such changes into account, including:*
 - (i) *Cost of capital (equity and debt);*
 - (ii) *Local, state, and Federal taxes;*
 - (iii) *Depreciation and amortization;*
 - (iv) *Operation and maintenance expenses, including interim replacements, insurance, administrative and general expenses, and contingencies; and*
 - (v) *The estimated capital cost and estimated annual operation and maintenance expense of each proposed environmental measure.*
 - (5) *A statement of the estimated annual value of project power, based on a showing of the contract price for sale of power or the estimated average annual cost of obtaining an equivalent amount of power (capacity and energy) from the lowest cost alternative source, specifying any projected changes in the cost of power from that source over the estimated financing or licensing period if the applicant takes such changes into account.*
 - (6) *A statement specifying the sources and extent of financing and annual revenues available to the applicant to meet the costs identified in paragraphs (e) (3) and (4) of this section.*
 - (7) *An estimate of the cost to develop the license application;*
 - (8) *The on-peak and off-peak values of project power, and the basis for estimating the values, for projects which are proposed to operate in a mode other than run-of-river; and*

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(9) The estimated average annual increase or decrease in project generation, and the estimated average annual increase or decrease of the value of project power, due to a change in project operations (i.e., minimum bypass flows; limits on reservoir fluctuations).

1 COST OF ORIGINAL DEVELOPMENT

This application is for a new license, not an initial license; the Turners Falls Hydroelectric Project and the Northfield Mountain Pumped Storage Project were previously licensed in 1980 and 1968, respectively. Accordingly, the Commission's regulations do not require FirstLight to include a statement of costs of lands, water rights, structures or facilities. 18 C.F.R. § 4.51(e)(1). FirstLight is seeking a single license for the facilities which are referenced below as the Turners Falls Development and the Northfield Mountain Pumped Storage Development (collectively the Northfield Project or Project).

2 ESTIMATED AMOUNT PAYABLE IN THE EVENT OF PROJECT TAKEOVER

To date, no agency or interested party has recommended a Federal takeover of the Project pursuant to Section 14 of the Federal Power Act (FPA). If such a takeover were to occur, FirstLight would have to be reimbursed for the net investment, not to exceed the fair value of the property taken, plus severance damages, if any, to property of the licensee valuable, serviceable, and dependent for its usefulness on the continuance of the license, but not taken. (Section 14, FPA).

2.1 Fair Value

The term "fair value" is not defined in the FPA Section 14. FirstLight, through its parent company GDF SUEZ Energy Generation, NA has recently entered into a definitive agreement for the sale of FirstLight Hydro Generating Company. Based upon an allocation of the purchase price, the fair market value of the Project is \$1,037 M USD. Because of the unique role of the Project in ensuring electrical reliability of the regional grid, FirstLight believes an alternative approximation of fair value is the cost to construct and operate a comparable power generating facility.

2.2 Net Investment

The FPA defines "net investment" as the original cost, plus additions, minus the sum of the following items (to the extent that such items have been accumulated during the period of the license from earnings in excess of a fair return on such investment): (a) unappropriated surplus; (b) aggregate credit balances of current depreciated accounts; and (c) aggregate appropriations of surplus or income held in amortization, sinking fund, or similar reserves.

The Turners Falls and Northfield Mountain Pumped Storage Development's net investments are \$284,970,827 and \$926,156,091, respectively, with a combined net investment of \$1,211,126,918.

2.3 Severance Damages

Severance damages are determined either by the cost of replacing (retiring) equipment that is "dependent for its usefulness upon the continuance of the License" but not taken (Section 14, FPA). At this time, the only equipment, facilities or structures and related contractual obligations and requirement that are not required for the successful operation of the Project are associated with the approximately 3 MW solar array on the east bank of the Connecticut River within the Project Boundary. This solar project has no connection to the Turners Falls or Northfield Pumped Storage Developments and if the Project were taken, the Solar Farm would need to be compensated.

It will not be possible to separate the Solar Farm from the Project because a portion of the Northfield Mountain Pumped Storage tailrace runs under the land occupied by the Solar Farm. Rather, the Solar

Farm would remain and incremental Operations and Maintenance Costs resulting from the assumption of the Northfield Pumped Storage Development Project would be due to the Owner as Severance Damages.

Under the terms of its current Lease and O&M Agreements with FirstLight Hydro Generating Company, NFM Solar Power, LLC pays an annual land lease fee as well as those costs associated with O&M related expenses. It is assumed that the land lease fee would remain unchanged. However, the O&M costs, specifically labor costs, are based upon the operations and maintenance personnel from Northfield Mountain Station performing these duties. If the federal government were to assume the Northfield Pumped Storage Development Project, there would be an incremental increase in labor cost because either additional staff or external resources would be required to perform the tasks currently undertaken by Northfield personnel. This is estimated to be one full time equivalent person at a fully loaded annual cost of \$100,000 (2016 USD). Allowing for the current labor cost included in the O&M Budget the incremental labor cost would be \$75,000 per year (2016 USD).

3 ESTIMATED CAPITAL COST OF PROPOSED DEVELOPMENT

The Final License Application (FLA) is incomplete at this time as many of the studies have not been finalized. At this time, FirstLight is not proposing to add any additional power generation facilities to the Turners Falls Development or Northfield Mountain Pumped Storage Development. However, pending the magnitude of any future minimum flow release at the Turners Falls Dam, FirstLight will likely evaluate the feasibility of a minimum flow turbine generator at the dam.

4 ESTIMATED AVERAGE ANNUAL COST OF PROJECT AS PROPOSED

The average annual cost of the Project as proposed includes capital costs, taxes, depreciation, as well as operations and maintenance costs. The average annual costs also will include capital costs and operation and maintenance expenses associated with proposed Protection, Mitigation and Enhancement (PME&E) measures. At this time, because some studies are incomplete, FirstLight is not proposing any PM&E measures. When studies are complete and the impact of Project operations on various resources are further evaluated, FirstLight will evaluate potential PM&E measures.

4.1 Capital Costs

The estimated average annual capital costs for the Turners Falls Development and Northfield Mountain Pumped Storage Development as currently proposed are \$1,901,763 and \$15,308,478, respectively (total of \$17,210,241). These costs include life cycle costs such as runner replacements, generator rewinds, and oil circuit breaker replacements and routine replacement of vehicles and tools.

4.2 Taxes

The actual annual property taxes for the fiscal year ending June 2015 for the Turners Falls Development and Northfield Mountain Pumped Storage Development are \$3,747,920 and \$8,307,402, respectively. FirstLight estimates paying for the Turners Falls Development and Northfield Mountain Pumped Storage Development approximately \$2,627,492 and \$11,166,499, respectively in Development-related Federal income taxes, and approximately \$157,649 and \$669,989, respectively in Development-related state income taxes annually. A summary of the local, state and federal taxes for the fiscal year ending June 2015 are shown in [Table 4.2-1](#).

Table 4.2-1: Federal, State, and Local Taxes Associated with the Project (FY 2015 dollars)

Tax	Turners Falls Development	Northfield Mountain Pumped Storage Development	Total
Local (property)	\$3,747,920	\$8,307,402	\$12,055,322
State	\$157,649	\$669,989	\$827,638
Federal	\$2,627,492	\$11,166,499	\$13,793,991
Total	\$6,533,061	\$20,143,890	\$26,676,951

4.3 Depreciation and Amortization

The estimated annual depreciation and amortization costs associated with the Turners Falls Development and the Northfield Mountain Pumped Storage Development are \$6,771,000 and \$28,957,000 (total of \$35,728,000), respectively.

4.4 Operation and Maintenance Expenses

Annual operations and maintenance (O&M) expenses include interim replacements, insurance, and administrative and general costs associated with the operation of the Project, as well as compliance with environmental measures. The estimated O&M costs for the Turners Falls Development and Northfield Mountain Pumped Storage Development as currently proposed are approximately \$3,731,591 per year and \$11,023,783 per year, respectively (total of \$14,755,374).

4.5 Costs of Environmental Measures

FirstLight is not proposing any environmental measures until the results of the on-going studies have been completed and the results analyzed. If measures are added, they would add capital costs, and increase annual operations and maintenance costs for the Project.

5 ESTIMATED ANNUAL VALUE OF PROJECT POWER

Turners Falls Development

If all of the Turners Falls Development generation was sold into the market, it would be priced at the Day Ahead and Real Time Locational Marginal Prices that clear for each generator. For 2013, the Turners Falls Development had a realized energy value of \$58.18 per MWh (this is a realized value calculated as revenue divided by generation). The economic analysis of the Turners Falls Development also recognizes that the New England Power Pool (NEPOOL) market values the capacity, reserve and ancillary/regulation services provided by generation facilities.

Capacity is required by NEPOOL to ensure the reliability of the electric system and the price is established by NEPOOL through the forward capacity auction process. For 2013, the actual capacity revenue received by the Turners Falls Development was \$2.22 million.

In addition to energy and capacity the Turners Falls Development produces ancillary and real-time reserve services necessary for effective system control. For 2013, the ancillary services revenue has been calculated as (\$112,592) per year and the revenue from real-time reserve is \$77,441.

[Table 5.0-1](#) below shows the total valuation of the power based on the product components identified above. This assumes an average net generation of 356,376 MWh annually. The annual market value of the energy, capacity and reserve and ancillary services is approximately \$22,915,259 per year, which equates to \$64.30 per MWh.

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Table 5.0-1: Valuation of the Annual Output of the Turners Falls Development (2013)

Revenue Source	Value
Energy (\$58.185/MWh for Year 2013 for 356,376 MWh)	\$20,735,750
Capacity	\$2,214,660
Reserve	\$77,441
Ancillary*	(\$112,592)
Total Value	\$22,915,259
Total Value per MWh (\$22,915,259/356,376 MWh)	\$64.30

NOTE: Numbers may not be exact due to rounding.

* Ancillary includes Utility charges for electric production

Northfield Mountain Pumped Storage Development

If all of the Northfield Mountain Pumped Storage Development generation was sold into the market, it would be priced at the Day Ahead and Real Time Locational Marginal Prices that clear for each generator. For 2013, the Northfield Mountain Pumped Storage Development had a realized energy value of \$85.17 per MWh (this is a realized value calculated as revenue divided by generation). The economic analysis of the Northfield Mountain Pumped Storage Development also recognizes that the NEPOOL market values the capacity, reserve and ancillary/regulation services provided by generation facilities.

Capacity is required by NEPOOL to ensure the reliability of the electric system and the price is established by NEPOOL through the forward capacity auction process. For 2013, the calendar average forward capacity auction clearing price was \$2.951/KW-month while the capacity revenue received by the Northfield Mountain Pumped Storage Development was approximately \$35.5 million.

Forward Reserve Market is an ISO-New England (ISO-NE) market to acquire, in advance, capability to supply pool-required Operating Reserve. It is a voluntary market and the price is set through two Forward Reserve Auctions per year, a four month summer season and an eight month winter season. In 2013, the Northfield Mountain Pumped Storage Development participated in the forward reserve auction and real-time reserves with the revenue received from this market of \$14,931,318.

In addition to energy, capacity and forward reserve market, the Northfield Mountain Pumped Storage Development produces ancillary and regulation services that provide spinning and offline reserve and “fine tuning” necessary for effective system control by responding to minute-to-minute changes in load. For 2013, the ancillary services and regulation revenue has been calculated as \$3,561,234.

[Table 5.0-2](#) below shows the total valuation of the power based on the product components identified above. Off-peak energy costs for pumping in 2013 reflects the NEPOOL Western Massachusetts real time Locational Marginal Price for all of 2013. This assumes an average net generation of 808,943 MWh annually. The annual market value of the energy, cost for energy, capacity and forward reserve and ancillary/regulation services is approximately \$81,791,723, which equates to \$101.11 per MWh.

Table 5.0-2: Valuation of the Annual Output of the Northfield Mountain Pumped Storage Development (2013)

Revenue Source	Value
Energy (\$85.172/MWh for 808,943 MWh)	\$68,899,098
Energy for Pumping (\$40.012/MWh) for 1,069,438 MWh	(\$42,790,965)
Capacity	\$35,520,940
Locational Forward Reserve Market and Real-Time Reserves	\$14,931,318
Ancillary (NCPC, Posturing, ISO-Fees)	\$1,670,097

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Revenue Source	Value
Regulation	\$3,561,234
Total Value	\$81,791,723
Total Value per MWh (\$81,791,723/808,943 MWh)	\$101.11

NOTE: Numbers may not be exact due to rounding.

* Ancillary includes ISO-NE expenses

6 SOURCES AND EXTENT OF FINANCING

The Project finances capital projects using cash flow from operations and as necessary additional debt obligations. The Project is part of a portfolio of 13 hydro assets which together service an existing first mortgage bond obligation. Based on the value of Project power, the Project should have adequate financial resources to meet the costs of operation of the Project for the term of the new license.

7 ESTIMATED COST TO DEVELOP LICENSE APPLICATION

The cost to develop the information necessary to complete the license application through March 2016 is estimated to be \$18,100,000. Note that cost is expected to rise as some studies are not final. This estimate includes all study costs, Integrated Licensing Process (ILP) costs, and personnel and administrative costs associated with processing.

8 ON-PEAK AND OFF-PEAK VALUES OF POWER

The Northfield Mountain Pumped Storage Development and the Turners Falls Development operate within NEPOOL, whose geographic area includes Connecticut, Maine, Massachusetts, New Hampshire, Rhode Island and Vermont¹.

The Market has provided the historical 2013 Real Time On-Peak and Off-Peak prices for the Northfield Mountain Pumped Storage Development generation node:

On-Peak Price	\$62.99/MWh
Off-Peak Price	\$47.34/MWh

The Market has provided the historical 2013 Real Time On-Peak and Off-Peak prices for the Turners Falls Development generation node:

On-Peak Price	\$63.43/MWh
Off-Peak Price	\$48.70/MWh

9 ESTIMATED AVERAGE ANNUAL INCREASE OR DECREASE IN PROJECT GENERATION

At the time of filing the license application, not all of the FirstLight studies are complete. Thus, FirstLight has not determined if average annual Project generation will increase or decrease. FirstLight has not finalized its proposed operation for the Project. However, FirstLight is proposing to utilize more of the Upper Reservoir storage capacity, which could result in an increase in Project generation. As noted in Exhibit A, the current FERC license allows the Upper Reservoir to operate between 1000.5 feet to 938

¹ The data referenced were the historical Day Ahead LMP values for Northfield Mountain for 2013 retrieved from nMarket. The Northfield Mountain Pricing node (Pnode) ID is #14220.

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feet, for a 62.5 foot drawdown. FirstLight proposes to increase the useable storage of the Upper Reservoir from 1004.5 feet to 920 feet year-round, for an 84.5 foot drawdown.