

FirstEnergy Pumped Hydro Lost Opportunity Proposal

FirstEnergy believes the holding of water at a pumped hydro station for Black Start Service represents a Lost Opportunity. The Lost Opportunity by holding water and not generating during on peak hours represent a margin stream that is not captured.

If a Pumped Hydro plant maintains a pond level 15 feet above the floor of the reservoir for Black Start Services. At a generation rate of 50 MWH per foot drop of water in the reservoir, 750 MWH are not being generated on a daily basis.

FirstEnergy proposes that a Lost Opportunity formula be created, and adopted to capture the lost margin associated with retaining water in the upper reservoir for the support of Black Start Services.

FirstEnergy also proposes the Lost Opportunity revenue be paid as a monthly adder to the Black Start Services Formulaic value.

The proposed formula is as follows:

$$\text{\$/Year} = (\text{Lost MWH/year}) * (\text{Plant LMP on peak} - (\text{Plant LMP off peak} / \text{pump efficiency}))$$

Definitions:

Lost MWH/year – represents the annual total of the MWH that could be generated by the water retained for Black Start Services. The number of days per year the unit could generate is calculated at 52 weeks/year times 5 days a week for a total of 260 days per year minus outage days associated with reservoir repairs (traditionally 10 days in the spring).

Plant LMP on peak – represents the average Real Time on peak LMP at Plant for the previous planning year (June 1, to May 31).

Plant LMP off peak – represents the average Real Time off peak LMP at Plant for the previous planning year (June 1, to May 31).

Pump efficiency - is the ratio of the power generated from operations compared to the power required to pump the water back to the upper reservoir. For most hydro plants the pump efficiency is approximately 70% (0.70)

See next page for an example calculation.

Example of the Lost Opportunity calculation:

Givens:

15 feet of water held for Black Start Service
50 MWH per foot drop in water level
Pump efficiency = 0.70

Assumptions:

Generate the Lost MWH every Mon - Fri on peak hours for 52 weeks (260 days/year)
Outage days per year for reservoir work are traditionally 10 days

Calculated Values:

Lost MWH/yr = (15ft) * (50 MWH/ft) * (260 day/year – 10 days/yr) = 187,500 MWH/year
For the previous annual time frame of June 1, 2009 to May 31, 2010
Plant RT LMP on peak = \$ 45.00/MWH (average for 12 months)
Plant RT LMP off peak = \$ 20.00/MWH (average for 12 months)

Formula and calculation:

$\$/\text{Year} = (\text{Lost MWH}/\text{year}) * (\text{Plant LMP on peak} - (\text{Plant LMP off peak} / \text{pump efficiency}))$

$$\begin{aligned} &= (187,500 \text{ MWH}/\text{yr}) * (\$45/\text{MWH} - (\$20/\text{MWH} / 0.7)) \\ &= \$2.545642 \text{ Million}/\text{yr} \end{aligned}$$

So the \$2.545 million dollars would be paid at a monthly rate of \$212,053.57 per month.