Depreciation Considerations Under Energy Transition Scenarios

By Branko Terzic

The “grand transition” in energy in the USA away from fossil fuels to renewable and/or non-carbon emitting technologies is well underway in many states. This transition will require: the replacement of existing coal and natural gas power plants with renewable energy production; the replacement of natural gas in space heating and cooking with electricity and the replacement of internal combustion engine (ICE) vehicles with electric vehicles (EV).

My estimates are that future electric generation (kWh) in the USA needs to be increased by a factor of five (5X) to meet these goals. The new installed electric capacity (kW) however will need to be increased significantly in excess of 5X due to the intermittency of solar and wind power and the need to charge enormous batteries (not yet available) to have 24/7 energy available to meet expected demand. Supporting the new renewable electric generation will require a new or upgraded electric transmission and distribution network. The following are some of the implications of the transition for the future depreciation expenses of regulated electric and gas utilities. The changes will be in the professional estimates of future service lives, cost of removal and salvage for each asset account.

New technology estimates

One scenario is related to the introduction of new technologies in generation, transmission, storage, distributed electric generation (DER) and electric vehicle (EV) related charging equipment owned by the regulated utility. New technologies, offering no retirement history will require economic service lives, and cost of removal and salvage estimates based on the best available engineering and professional depreciation expert judgement.

Retirements due to functional obsolescence – inadequate capacity

Existing transmission and distribution facilities may have inadequate capacity to handle the higher electric loads caused by switching home heating and cooking to electricity and the addition of more home chargers for electric vehicles. Thus, assets will need to be retired earlier than originally planned due to the inability of existing assets to provide adequate service. The challenge here is to recognize these factors early enough to have regulators approve new depreciation rates to fully depreciate the assets over their new shorter remaining lives.

Retirements due to functional obsolescence – failure to meet new environmental standards

Electric utilities still owning and operating coal and natural gas fueled power plants face continuing issues of changing EPA emission regulations and the inability to, in the future, meet the standards of the new regulations. There is federal research money now being allocated to studies and pilots on carbon capture and storage (CCS) technologies which may enable these power plants to operate under the new Clean Air regulations. Depreciation analysts will need to monitor this closely. In addition, the CCS equipment, when added to rate-base in regulated electric utilities, will need separate depreciation rates, once again with no retirement history to support economic service life estimates.

Uncertain regulatory future for natural gas utilities

In the case of natural gas distribution utilities, the future of natural gas service may be determined by legislation rather than by the regulators. This uncertainty may lead managements to request higher depreciation rates providing for greater certainty of capital recovery. Professor James Bonbright's Principles of Public Utility Rates should be reread on these issues as his recommendation appears to me to be one of it being better to error on the side of more rapid capital recovery than risk non-recovery resulting in stranded costs.

Getting Depreciation Wrong

The result of future depreciation decisions can be "wrong" if either 1) the assets are retired before being depreciated leading to "stranded" investment or 2) the assets are fully depreciated but remain in service for a significant amount of time at zero net plant investment.

The impacts of being "wrong" are different in the two cases. The treatment of "stranded assets" is subject to numerous options and requires significant regulatory analysis and

decision-making. A likely outcome in a stranded cost case is a regulatory order amortizing the net plant remaining in future utility rates.

In the case of fully depreciated assets remaining in service the impact on consumers would be that rates were slightly higher for a period prior to the end remaining life date and then rates would be reduced significantly as the assets in question remain in service at no cost in the revenue requirement due t zero rate base value and no further depreciation.

Hypothetically if the entire rate base were fully depreciated there would be no annual depreciation expense (except for new assets) nor any return on rate base in the annual revenue requirement. In that case regulators could switch from Rate-of-Return regulation to the Operating Ratio Method of rate setting.

Strange as it might seem for a utility to be fully depreciated and still providing service there are examples in the water utility industry. In those cases, the fully depreciated rate base occurred because the regulator previously allowed the water utility to depreciate, but not earn on, “contributed plant”.

Conclusion

I believe that known depreciation methods can be applied correctly under all “grand transition” scenarios. The key is timely recognition by management and regulators of the factors affecting future service lives, cost of removal and salvage. This requires trained experts at the regulatory agencies, and at regulated companies to recognize these factors affecting depreciation in the transition early enough to present their data to the depreciation professional conducting the studies and making the recommendations.

Finally, successful depreciation policies also require regulators to apply depreciation and rate making principles fairly and scientifically. Courses in depreciation analysis are no longer provided by engineering schools such as Iowa State University and Michigan State University as it was up to the 1970s.

However, the Society of Depreciation Professionals (SDP) provides both training and certification in depreciation analysis. The next training session will be held in conjunction with the annual meeting September 15-20, 2024, in Milwaukee Wisconsin. Please got to the SDP website for registration and course information www.depr.org

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The Honorable Branko Terzic is a former Commissioner on the U.S. Federal Energy Regulatory Commission and State of Wisconsin Public Service Commission, in addition to energy industry experience was a US Army Reserve Foreign Area Officer (FAO) for Eastern Europe (1979-1990). He hold a BS Engineering and honorary Doctor of Sciences in Engineering (h.c.) both from the University of Wisconsin- Milwaukee.