Section 5 – Designing Financial Incentives for Utility Involvement in Distributed Resources

As has been discussed previously, utilities are uniquely qualified to encourage the deployment of efficient distributed resources (DRs) due, among other things, to their on-going account management of likely candidates within their service territories. As with any business, it is essential that they have an opportunity to earn a return for their efforts. These efforts would be to promote the efficient development and use of distributed resources. Utility involvement in distributed resources will not be optimized or maximized merely by the removal of disincentives or barriers. While removing disincentives or barriers is a necessary step, it is not sufficient to elicit the commitment required to fully exploit efficient distributed resource development. To make this happen, utilities must be allowed to make a business out of DR, by earning a return appropriate to compensate for the risks involved so that they have an incentive to spur the development of efficient DR

Well designed financial incentives can produce benefits for customers by encouraging the kind of DR development that lowers cost to society, even as utilities earn a return on DR activities. Well deigned incentives will bring forth the creativity and innovation needed to configure DR services in ways that work for retail customers.

In this section[1] we will explore several different models for promoting utility involvement in distributed resources through financial incentives. These models generally are constructed from regulatory concepts that are well established and would be tailored to reward the promotion of efficient DR. Before turning to the specific models we will briefly discuss some principles that must apply if utility involvement in DR is to be encouraged in an optimal manner.

1. Incentives should be tailored so that the DR initiatives that result are efficient. Efficient means that the benefits resulting from these DR initiatives outweigh costs and customers are generally better off and none are worse off as a result of DR. DR investments which are not cost beneficial or benefit some customers at the expense of others are not efficient and should not be encouraged with incentives.

[1] In previous sections of the paper we have addressed ways to remove disincentives to utility promotion of DR deployment such as providing for targeted recovery of lost revenues and implementing rate designs that rely on contract demands as opposed to metered demand or energy to recover the costs of distribution facilities.

2. While utilities have a unique role to play in encouraging DR, efficient DR programs will not be limited to those in which the utility is the only or the primary developer. The important role of the competitive market and competitive DR suppliers should be recognized and incentives should encompass utility efforts to collaborate with and support these DR suppliers.

3. The recovery of DR investments and expenses should be timely and full. If DR expenditures, which may not be large relative to total costs, are recovered through specific rate mechanisms that clearly provide for full and timely recovery, the incentive to invest in DR will be at its greatest.

4. The recovery of earned incentives should be clearly incremental to base earnings. Incentive mechanisms that do not provide incremental earnings will not provide an effective inducement to DR involvement by utilities.

5. The particular incentive mechanism can be tailored to the purpose and jurisdiction. Jurisdictions that are open to more complex ratemaking and longer term price indexing plans can achieve incentives that are both stronger and reward efficiency in DR implementation. More conservative jurisdictions can still provide incentives that should prove effective at encouraging DR deployment, but these incentives may be weaker and less well targeted to efficiency in DR deployment.

1. Rate Basing with Incentive Rates of Return

The first basic model explored is rate-basing of investment in distributed resources with an incentive rate of return. This model is most likely to be attractive in situations where the utility would make a significant investment in distributed resources – e.g., distributed generation, or other capital investments to allow load shifting or shedding. There may well be circumstances in which distributed resources that require significant capital investment provide an efficient solution, but institutional barriers limit the market development of these resources. The utility may be in the best situation to overcome these barriers by direct investment and ownership. In evaluating investment opportunities, utilities will consider both risk and return. The incentive to invest will be at its highest when the risk-return balance provides reasonable risks of cost recovery and returns that are attractive for the risk taken. Distributed resources are likely to pose risks that are novel and difficult to evaluate. For example, the dispersed nature of the investment, the decentralized operating requirements and the significant customer involvement required to make DR work are all factors that can add to risk. To mitigate these risks and provide a financial incentive, utilities should be ensured of a clear opportunity to recover capital

investment in DR and to earn an enhanced return on distributed resources, which may require significant investment.

The suggested model would involve tracking and capitalization of DR program costs and investments. These capitalized costs would then be recovered over an appropriate amortization period that reflected the expected economic life of the DR equipment. The utility would be allowed an incentive equity return on unamortized DR investment that compensated it for the technical and commercial risks involved. Incentive returns have been found desirable in a variety of situations. The FERC has found that incentive return levels should apply to transmission investments in certain situations to achieve policy goals with respect to transmission. Incentive returns have also been provided by state regulators in connection with achieving DSM goals to promote that policy alternative. Incentive returns have been provided in connection with performance-based ratemaking plans to compensate for risk and reward efficiency. Finally incentive returns have been provided to compensate for risk. In connection with DR, the incentive portion of the return would be motivated by three factors. First, there are, as discussed above, risks to DR that exceed normal investment risks and require a higher level of compensation. Second, there is a policy goal to promote efficient DR and an incentive can help achieve that goal. Third, an incentive can be tailored so as to encourage and reward the most efficient deployment of DR.

In order to ensure the incentive is powerful in all circumstances, the recovery of the invested capital, an incentive return on the unamortized invested capital and the recovery of the operating expenses of the DR program would be achieved through a rate rider that would be periodically and automatically reset to provide for recovery of DR investment and expenses on an as incurred basis. Hence, without regard as to whether the utility was over or under earning, it would receive incremental revenue and profit from the DR investment in order to ensure that the incentive is not diluted by the base financial situation. In order to encourage efficiency in DR investment, the incentive portion of the return would be set based on the expected benefit to cost ratio of the investment. The higher the benefit to cost ratio, the greater the efficiency and hence the greater the incentive return.

The basic steps in such a model, which are illustrated in Diagram x, can be described in text as follows:

1. The costs of implementing a DR program (including research and marketing costs would be tracked);

2. Specific investments and overall program costs would be analyzed and prospective benefit to cost ratios estimated using procedures agreed to with regulators;

3. Utilities would implement the DR and would maintain an account that capitalized all program development costs and capital investments;

4. Periodically (e.g., monthly or quarterly), a rate surcharge would be calculated and implemented to provide for recovery of costs;

5. The revenue requirement would include all expenses, amortized capital investment and an incentivized return on unamortized capital investment;

6. The surcharge would apply without regard to the earnings situation and the return element of the surcharge would be excluded from earnings tests, ROE sharing or rate case revenue determination; and,

7. The incentive rate of return would consist of the base rate of return plus adders based on the prospective benefit to cost ratios[2] of selected investments. The higher the ratio, the greater the incentive component. This would direct resources to the most efficient distributed resources; these are resources with the greatest benefit to cost ratios. For example, investments with benefit to cost ratios up to 1.5 may receive a 100 basis points incentive. Those with ratios between 1.5 and 2.0 may receive a 150 basis point incentive. Investments with benefit to cost ratios over 2.0 may receive a

[2] The determination of benefit to cost ratios is outside of the scope of this paper. It is important that these are developed reasonably and that benefit estimation is realistic if the DR that results is to be efficient. Benefits should consider all savings from the market as well as possible savings from transmission and distribution investment deferral.

200 basis point incentive. The sliding scale would serve the added purpose of encouraging the most efficient investment. DR with a benefit to cost ratio of less than one would not be efficient and would not be implemented. (Please note the incentive levels herein are illustrative and used only to clearly illustrate the concept. In practice appropriate levels will need to be determined and a more continuous function may be superior to block levels.)

The key elements of the model are an assurance of full and timely cost recovery to offset technical risk, provision of an incentivized return on unamortized investment to spur pursuit of the most efficient distributed resources and isolation of the return component from other earnings adequacy tests in order to ensure that profits realized from efficient DR development are fully incremental.

This model is generally suited to investments that are made directly by utilities in DR. However, these investments need not be restricted to DR that is owned by utilities. Investments in programs and systems to facilitate DR by customers and/or competitive suppliers would also qualify for this treatment and, if desired as a matter of policy promotion, third party DR could be specifically considered in setting the incentive return level.

2. Aggregation and Market Interface Benefit Sharing

All distributed resources will not require significant investment. In some cases, customers or equipment and service providers may be able and willing to install the equipment and devices needed to implement distributed resources, but may lack the ability to aggregate the utilization of these resources and employ them most efficiently in the market context. These resources are in many cases too small to justify or to qualify for individualized RTO participation.

In these situations, the utility could be well positioned to serve in an aggregation role and coordinate the operation of the distributed resources and the bidding of these resources in the market. Further, in situations where there penalties for non performance, aggregation and diversity of resources may help avoid such penalties. In these situations incentives could be developed related to the value that the utility as an aggregator is able to realize in the market.

The incentive model, which is presented in Diagram y, can be described in text as follows:

1. The utility would assume responsibility for aggregating distributed resources and bidding these resources in to the energy, capacity and ancillary service markets;

2. Part of these activities may involve helping distributed resource providers certify that they are able to meet RTO program requirements and could involve partnering with customers and service providers;

3. The utility would be permitted to recover the base costs of its aggregation activities through a charge made for aggregation activities;

4. As an incentive to provide the service, the utility would be permitted to retain a percentage of revenues realized from bidding the resources in to the energy, capacity or ancillary service markets; and,

5. The incentive portion of revenue obtained from sharing in the market benefits of bidding would be excluded from consideration in earnings determinations in rate cases or earnings sharing contexts.

This model would provide utilities an incentive to offer aggregation and bid coordination services. There may well be instances where utilities are best positioned to provide these services, but have no clear way to recoup costs or make a profit. Absent the opportunity to make a profit, utilities will have no incentive to provide these services and development of efficient DR will be less than it could be. As these services will not likely require significant capital investment, the incentive rate of return is not likely to be a useful model. These services may be provided directly to customers or to distributed resource providers, stimulating the competitive market for these services.

3. Rate Basing with Incentive Rates of Return Combined with Long Term Delivery Service Rate Indexing

The rate basing and incentive rate of return model may or not be implemented in a way that captures the potential transmission and distribution savings that could arise from distributed

resource deployment. To the extent that T&D[3] savings are incorporated as benefits in the benefit to cost test, they would enhance the benefits, increase the benefit to cost ratio and increase the incentive. However, specifically identifying T&D benefits is difficult and it may not be possible to specifically identify all such savings. This does not however mean that distributed resources cannot provide significant T&D savings. It does mean that in some circumstances such savings may be hard to identify and track to particular distributed resource projects.

Efficiency in DR is best achieved when T&D savings can be recognized as a benefit and factored in the investment decision. One model for this, in situations where benefits can not be easily identified or associated with single projects, would be to combine the rate basing and incentive rate of return model with long term performance based or price cap type of regulation. Under this system, delivery service prices would be indexed to inflation and productivity. Additionally, within a dead band of minimum and maximum earned returns, prices would be based on the index price. Finally, earnings as opposed to price would float. There are many variations of this type of regulation in then United States and internationally in both the electric and telecommunications industries. If earnings went under the allowed level, or if uncontrollable costs increased, rates would recalibrate upward. (Such plans often contain "off-ramps" that provide for re-openers in the event of changes in exogenous factors.) If earnings exceeded the upper end of the dead band, earnings sharing would be activated and prices reduced by a share of any earnings over the upper range of the dead band. The indexing and earnings sharing plan can extend over multiple years. The wider the dead band and the longer the period that the plan extends over, the greater the incentives for implementation of cost reduction will be. Such regulation fits well in to providing a DR incentive. The indexed rates under such a plan could provide for recovery of delivery service costs and the incremental recovery of DR expenditures is achieved through rate basing and recovery of DR investments and expenses through a rate surcharge. The dead band and earnings sharing on delivery rates would provide an incentive for the utility to deploy DR to minimize the need for distribution investment and make it more likely that it could achieve returns at the top end of the dead band or in to the sharing range. If the rate plan persisted over many years, the incentives to promote and implement DR that avoid

[3] This section refers to T&D benefits. However, in practice it may be more applicable to distribution benefits. Transmission is under FERC jurisdiction and not under state jurisdiction. In regions that have unbundled, working transmission benefits in to the incentive model may be difficult.

distribution system expansion and optimize the efficiency of distribution investment and DR would be very strong. This is the case because under these types of rate plans, revenues are independent of an individual's utility cost for the term of the plan. Savings on distribution costs and investments would not lower rates during the rate plan period, but would inure to the benefit of customers after that period. Hence an incentive is provided to implement DR that will be most effective in reducing distribution costs. While this incentive can be combined with rate basing of DR investment, it could also provide the utility a strong incentive to promote DR by third parties as the savings in distribution costs would still accrue to the utility over the rate plan period and to customers over the long term.

Diagram z depicts this incentive model graphically. In text it can be described as follows:

1. Model 1, the rate basing model. with an incentive return is implemented for DR cost and investment recovery;

2. The benefit to costs ratios in model 1 exclude distribution savings; and,

3. A comprehensive delivery service indexed rate plan is adopted that has the following features:

    a) A duration of at least 5 years and preferably 10 years

    b) Delivery services rates indexed to inflation with a productivity offset[4]

    c) Appropriate off ramps

    d) An earnings dead band with ROE sharing if earnings exceed the top of the dead band and rate recalibration if earnings fall below the bottom end

DR savings related to distribution savings are not specifically identified, but as they reduce distribution investments and costs, they result in savings that can be shared between customers and shareholders. This model would be effective in encouraging the deployment of DR to

[4] Determination of inflation indexes and productivity indexes is outside the scope of this document. These indexes would determine the growth rate of delivery service rates and would therefore be non-trivial. Determinations of such indexes may be the subject of much debate and negotiation.

optimize distribution and could work equally well in encouraging efficient DR that utilities own as well DR that utilities promote in conjunction with competitive suppliers.

4. Fixed Incentives for Achieved DR

Complex regulatory models are not well accepted in all jurisdictions. In jurisdictions where such models would not be embraced, a simpler incentive mechanism would be to provide the utility with a fixed monetary incentive per kW of achieved DR. While the model would not be particularly strong at identifying and promoting efficient DR, it would jump start DR by promoting utility involvement.

The incentive model, which is presented in Diagram zz, can be described in text as follows:

1. An agreed incentive for DR which the utility facilitates would be developed;
2. DR investment and expenses would be recovered through either normal ratemaking or a tracking account and rate surcharge;
3. An incentive amount per KW of achieved DR deployment would be agreed to;
4. The utility would realize, through a rate adjustment or surcharge, an amount equal to the achieved DR kWs times the agreed upon incentive; and,
5. The incentive amounts would be incremental to base earnings.

This model is a basic model that would most likely apply in situations where there was a desire to jump start DR and a desire to maintain simplicity in the regulatory framework. The model is the weakest at encouraging efficient DR as it does not base the incentive on the degree of efficiency. DR that is not cost justified would not qualify for any incentive.

5. Combinations of Incentives

Model 3 above combines the rate base with an incentive return model with a long term price indexing model for delivery service costs. This is not the only combination possible. Model 2, involving incentives for aggregation and bid coordination based on RTO markets could also be combined with Model 1 and Model 3. Under those combinations, the incentive component of the

return would be reduced so that only recovery of investment, the base rate of return and expenses would be reflected in the rate surcharge to recover DR costs. The incentive component would be provided by sharing in the savings of revenues earned in RTO markets. If combined with Model 3, this would result in a situation where the costs of DR activity are recovered through a surcharge, distribution benefits flow through to the bottom line through a long term delivery service rate indexing plan and generation benefits are shared between the DR providers and the utility as an aggregator and/or bid coordinator. This combination would provide very efficient and comprehensive incentives for utility involvement in DR deployment, including DR initiated and owned by customers and competitive suppliers.

While Model 1, the incentive return model, applies to utilities that have unbundled and operate in RTO market settings as well as to utilities that have not unbundled and do not operate in RTO markets,[5] Models 2 and 3 primarily apply to unbundled utilities. Model 2 provides for a utility role in aggregation and bidding that would apply in market settings. Model 3 applies to unbundled distribution rates. While Model 3 could be extended to encompass indexed ratemaking for bundled rates that include generation, the risks of indexing long term bundled rates is quite high and the model would most likely not be practically applied to bundled rates.

6. Sharing of DR Economic Cost Savings

In jurisdictions that intend to retain a bundled generation, transmission and distribution service, a different incentive model to supplement Model 1 is desirable. In these cases, generation savings would be reflected through utility cost savings and not a market.

The foundation of such a model would be to develop estimates of the net economic benefits of DR deployment. Net economic benefits are defined as the savings achieved from DR – in effect the avoided costs made possible by DR – less the costs[6] of DR implementation and operation. The benefits in the case of a bundled utility would span generation, transmission and distribution.

The incentive model, which is presented in Diagram zz, can be described in text as follows:

[5] This is not a complete distinction. There are also utilities that have not unbundled and do not operate retail choice environments that are in RTO settings. Many MISO utilities are in this category. For purposes of this paper the primary distinction is whether the utility offers only bundled service or is unbundled and offers retail choice.

1. Provide for basic DR cost recovery through rate basing and a tracking account to assure recovery of all DR costs. This would be similar to Model 1, but without the incentive component on the rate of return. The incentive would come from sharing in the net economic benefits as described below;

2. Periodically review the present value of DR total costs as compared to the present value of DR savings;

3. Compute the net present value of DR economic benefits; and

4. Provide for recovery of a percentage of these benefits so that such recovery is incremental to base earnings and provides a financial incentive.

This model would work to encourage DR deployment by bundled utilities that most efficiently integrated DR with generation, transmission and distribution investment and operation.

7. Summary

The models described above are designed to prompt a discussion about DR. They are also intended to be a practical guide to financial incentives that draw upon established regulatory procedures and could be implemented. As noted, the models can be combined. Further, the models can be further refined. When implemented, there are many details that would need to be specified and could be tailored to various situations. As discussed at the beginning of this section, the principles upon which the models are founded are to provide incentives that promote efficient DR, provide models that facilitate DR in the context of a market and an environment where competitive suppliers of DR services can flourish, and provide utilities with financial incentives that compensate for DR risk and spur the development of efficient distributed resources.

[6] Costs must also consider lost revenues as appropriate.