



# **NEW ZEALAND INSTITUTE FOR THE STUDY OF COMPETITION AND REGULATION INC.**

## **OWNERSHIP VS. REGULATION IN ELECTRICITY REFORM: THE ROLE OF GOVERNANCE**

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### **Abstract**

Electricity reform typically involves little regard to the possibility that customer ownership might substitute for the “protections” of state ownership, or for investor ownership under regulatory safeguards, where market power is a concern. Recognising that regulation is itself costly, and that market contracting, ownership and regulation are partly substitutable forms of governance, this paper argues that state ownership of natural monopolies in electricity distribution (and transmission) is inefficient. Unregulated customer ownership of these activities is superior, better aligning monopolist and customer incentives at lower cost. Even unregulated investor ownership of distribution is predicted to better balance the costs of market contracting, ownership and regulation than does state ownership. Regulation of customer-owned distribution (and transmission) is also shown to be inefficient, imposing regulatory costs without compensatory gains. Examples of widespread customer ownership of distribution in New Zealand, and of distribution and sometimes transmission in the US, illustrates how such ownership has evolved as an effective substitute for regulation. Policy implications are drawn.

### **1. INTRODUCTION**

What sense does it make to subject a customer-owned distribution company to price controls, since those customers share

in any of its monopoly profits or can align its objectives more closely with their own? Similarly, why subject a state- or customer-owned grid company to price regulation? More generally, what role does ownership play in mitigating concerns about market power exercised by natural monopolies such as those in electricity distribution and transmission, and how should regulation be crafted to recognise and accommodate any such role? As Hart and Moore (1998, p. 41) put it, “the ownership of assets confers power”, so it is natural to ask whether ownership is more or less powerful than regulation in protecting customers against monopolies in electricity.

These questions subsume but extend the familiar debate regarding the relative efficiency of state and private ownership, and questions regarding the relative efficacy of different types of regulation. They recognise that different classes of natural monopoly owners face different risks of market power abuse. This then motivates consideration of whether regulation is efficient under all classes of monopoly ownership, and whether it limits efficient ownership options.

The aim of this paper is to show the overlaps between market contracting, ownership and regulation as means of aligning the interests of customers and natural monopolies in electricity – i.e. as “governance” mechanisms following the definition of Tirole (2001). This definition is

given content using the framework of Hansmann (1996), showing that ownership efficiently belongs with the parties minimising the combined costs of market contracting, ownership and regulation. The analysis concentrates on electricity distribution, but is later extended to transmission. For simplicity it is assumed that transmission and distribution are unbundled from competitive activities such as generation and energy retailing.

The paper is organised as follows. Section 2 describes examples of customer ownership of distribution and transmission. Section 3 explores the costs of regulation. Section 4 sets out the scheme under which different ownership and regulation arrangements are compared. The alternatives are assessed in Section 5. Section 6 extends the analysis to transmission. Section 7 draws policy implications and concludes.

## **2. EXAMPLES OF CUSTOMER-OWNED DISTRIBUTION AND TRANSMISSION**

Consideration of ownership's role in mitigating market power is warranted in the light of examples where customers voluntarily adopt ownership of distribution (and even transmission). Hansmann (1996) notes that while investor-owned utilities (IOUs) dominate electricity supply in the US, rural customer electricity cooperatives formed since the 1940s number almost 1,000, appear in 46 of 50 states, own almost 45% of all lines, cover 67% of the nation's land area, and supply around 10% of the population. Municipal electric utilities, a more diffuse form of customer ownership, number 1,500 and serve a larger and more diverse customer base. Smaller electricity cooperatives in turn band together to own upstream generation and transmission (G&T) cooperatives (Hansmann (1996), Burr (2004)). Such US cooperatives are operated to minimise operating costs while maintaining service levels. While they are non-profit and do not seek to earn monopoly rents, they might still manifest market power in terms of (e.g.) cost inefficiencies. Such inefficiencies could be exacerbated by their non-tradable ownership (Karpoff and Rice (1989), Porter

and Scully (1987)). Yet many customers have opted for this form of ownership.

Similarly, when New Zealand's urban and rural electricity customers were given a choice over distribution ownership in 1992, they predominantly opted for ownership of already for-profit distribution companies by customer trusts (Evans and Meade (2005)). This entitles customers to share in distribution company profits, providing a compensation for any excess profits arising from market power in some proportion to each customer's level of demand. A driving force behind such customer ownership in both the US and New Zealand has been the mitigation of potential market power abuse by these natural monopolies. This mirrors, for example, the formation of supplier cooperatives to mitigate downstream market power in dairy processing (Porter and Scully (1987)).

Importantly, while IOUs have been subject to rate regulation for much of the past century, most US rural electricity cooperatives have long escaped the regulatory net. As of June 2003, 47% of them were not subject to rate regulation, and a further 19% were subject to optional regulation, with those opting out of regulation outweighing those opting in by almost 8:1 ([www.nreca.coop](http://www.nreca.coop)). Where rate regulation is applied it is sometimes "streamlined" relative to that applied to IOUs. Notably, even G&T cooperatives are in some cases permitted to avoid rate regulation, even though they are more removed from their ultimate customers than their distribution counterparts, and hence offer more diffuse protection against market power abuse. While these arrangements might be argued to reflect regulatory capture (Stigler (1971), but see also Joskow and Rose (1989)), Hansmann (1996) argues it instead reflects a natural balancing of costs (more below). He concludes (p. 170) that "By aligning the firm's interests with those of its customers, cooperatives can avoid not only the costs of monopoly but also the costs of rate regulation."

By contrast, New Zealand customer ownership of distribution was adopted when only general competition law protections were offered against market power abuse – so-called "light-handed"

regulation. Since 2003, however, even customer-owned distribution has been subjected to CPI-X price controls similar to those commonly applied elsewhere, despite falling real distribution costs (Evans and Meade (2005)). This then begs the question – if customer ownership has long proved an effective bulwark against market power abuse in the US, is it necessary or useful to uniformly regulate natural monopolies in electricity across all ownership classes?

### **3. COSTS OF REGULATION**

The imperfections of various types of regulation are well known (e.g., see Newbery (1998), Sappington (2002)). More fundamentally, the “nirvana” view of government and regulators operating wisely, benevolently and costlessly with full information, has long been abandoned (Joskow and Rose (1989), Crew and Kleindorfer (2002)). Instead, a more sober view of regulation has emerged after years of regulatory experience, recognising the direct and indirect costs regulation entails.

The direct costs of regulation are apparent and large. Regulators face their own administration costs. Regulated firms face regulatory compliance costs, and like customers, regulatory participation costs (including the costs of lobbying and collective action). These costs fall to customers either wholly or in some part.

From the customer’s perspective, the indirect costs of regulation are equally clear. Regulatory objectives can be mis-specified by legislators, whether due to imperfect understanding of customer preferences, process capture by concentrated interests, other voting system imperfections, or outright conflict between government and customer interests. Similarly, regulators can misapply even well-specified objectives, whether due to imperfections in regulatory models, information asymmetries relative to both regulated firms and customers, simple human fallibility, or regulator self-interest (such as the vested interest in perpetuating and expanding regulation for the sake of ongoing tenure, irrespective of customer interests). Where the right goals are not specified, not pursued, or pursued with cost

and error, customers’ interests cannot be assumed to be served.

Additionally, regulation itself gives rise to distortions. It inherently influences prices, costs, quality, investment and bankruptcy risk in both intended and unintended ways. It affects both efficiency and distributional equity. Regulatory constraints can become self-fulfilling prophecies, pre-empting any actual competitive pressures on regulated firms. And lags, costs and frictions in changing regulation mean it can outlive its usefulness, and is slow to respond to changing circumstances or shocks. Combined with governments’ inability to make credible regulatory commitments, its very application raises investment risks affecting the timing, scale and nature of regulated firm investments, impacting current and future prices, quantities and qualities. All of these imply costs to customers.

It is therefore no surprise that calls are growing for feedback mechanisms to be added to the regulatory process, including merit reviews of regulatory decisions (e.g. House of Lords (2004)). As noted by Helm (1994, p. 18), “Intervention by government is only efficient if the costs of the market failures it addresses exceed the costs of intervention . . . Market failures must exceed regulatory failures.” Indeed, Glachant (2002, p. 4) states that “public regulation is not better in principle than private negotiation for dealing with market failure.” Given the costs of regulation, it is natural to ask whether existing or feasible alternatives to regulation might better serve customer interests.

### **4. COMPARATIVE SCHEME**

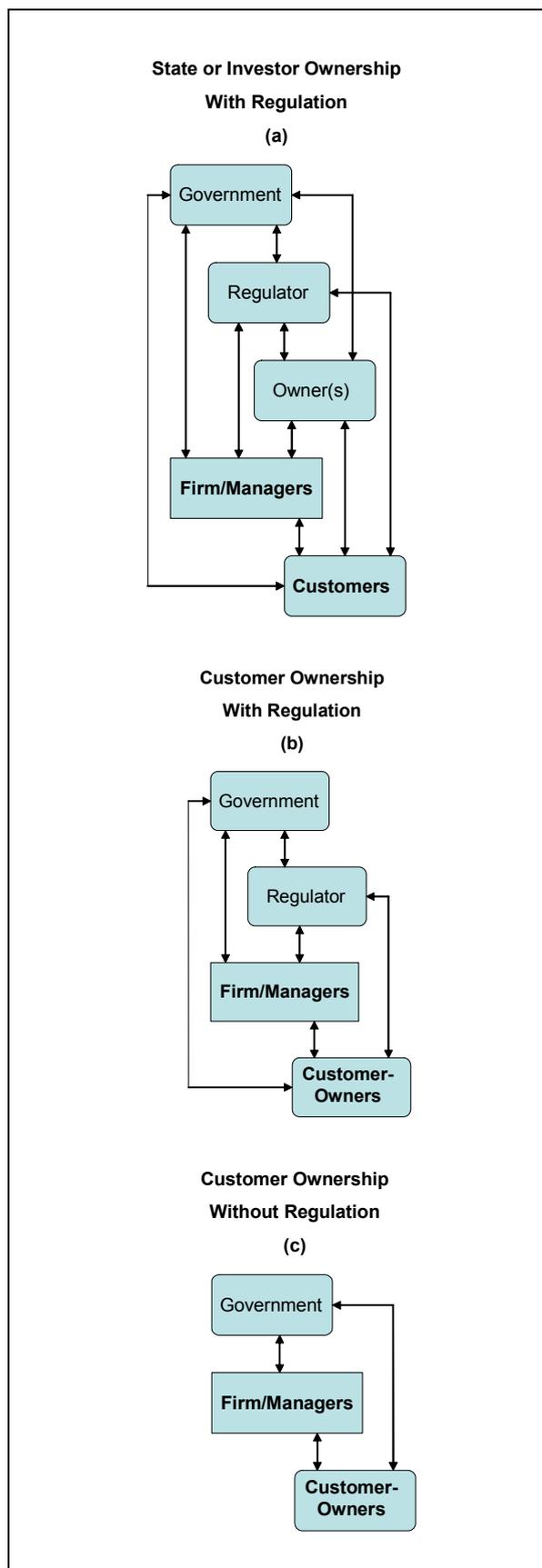
#### **4.1. Market Contracting, Ownership and Regulation as forms of Governance**

Tirole (2001, p. 4) defines corporate governance as “the design of institutions that induce or force management to internalize the welfare of stakeholders.” In this context the importance of customers as a relevant stakeholder class is presumed, as the protection of customers from market power abuse by distribution is a common concern of electricity reformers. Here management is taken to mean those who

run distribution companies, and who set their pricing and investment policies and control operating costs. Assuming that our goal is to best induce distribution managers to serve the interests of their customers, we thus have a governance problem.

This construction highlights the fact that market contracting, regulation and ownership occupy overlapping points on the governance spectrum. Where distribution companies are owned by parties other than their customers, market power prevents efficient market contracting for most smaller customers and hence it should be expected that such firms will not be governed so as to reflect those customers' preferences. This parallels the classic principal-agent problem as between shareholders and managers where ownership and control of the firm do not coincide (Jensen and Meckling (1976)). In this case third-party regulation might be expected to force a better alignment of owner and customer preferences, the mitigation of market power abuse in particular. But just as the separation of distribution ownership from customer patronage can be predicted to harm distribution customers, the separation of regulators and customers must also be predicted to impose costs on those customers. The problem is to some extent transformed without being eliminated. Indeed, Laffont and Tirole (1991) explain how the distribution company managers' dual accountability – to both shareholders and the regulator – gives rise to additional inefficiencies. In any case, an imposition of third-party regulation stands in place of market-based solutions to any problems of distribution market power, such as customer ownership.

Figure 1 illustrates the multiple governance relationships, with conflicts of interest possible for each, arising under different ownership and regulation permutations (ignoring third party conflicts). Panel (a) applies whether the monopoly is state- or investor-owned, with government/owner conflicts under state ownership referring to any conflicting objectives arising under state ownership (e.g. efficiency versus equity). As for Panel (b), the distribution company's managers



**Figure 1.** Governance conflicts (represented by arrows)

must satisfy two masters, with inevitable tradeoffs and costs. In both cases an elaborate governance apparatus – regulation mediated via the political process – stands in the place of competition and other market-based solutions to the monopoly problem. While this apparatus is intended to serve an obvious purpose in Panel (a), it complements or even conflicts with the moderating role of customer ownership in Panel (b), adding costs but potentially without any additional benefits. Panel (c) illustrates the most parsimonious solution to aligning customer and distribution company manager interests. Potential conflicts with government remain even in this case, although they should be reduced to the extent that customer ownership is an effective buffer against market power abuse. It is difficult, *a priori*, to predict which permutation of ownership and regulation should most effectively serve customers, but it is easy to see how governance conflicts might arise most under Panel (a), subject to any offsets between conflicts, and how Panel (b) might involve unnecessary costs. In any case, the alignment between firm/manager and customer incentives will be weakest in Panel (a), with customer ownership providing a stronger alignment, and hence governance benefits, in Panels (b) and (c).

#### 4.2. Efficient Organizational Forms

Hansmann (1996) argues that when left to market forces, ownership of organizations will fall to those organization patrons who bear the lowest sum of two types of cost:

- The costs of market contracting; and
- The costs of ownership.

In our case the costs of market contracting include the costs to distribution company customers of market power abuse. These costs might be expected to vary inversely with customer size, as larger distribution company customers should have greater capacity than smaller ones to negotiate supply contracts on favourable terms. Hansmann treats the costs of regulation as implicit in the costs of market contracting. In this paper we treat these costs as a third, distinct class faced by

distribution customers, to emphasise the tradeoffs of interest.

Conversely, the costs of ownership include Jensen and Meckling's (1976) "agency costs" arising where distribution company owners do not themselves manage those companies, such as the costs of managerial slackness, excessive perks or inefficient investments, and the costs of mechanisms to reduce such costs (e.g. incentive-based compensation, audit costs and other monitoring). Ownership costs also include the costs of collective decision-making, which increase with the number and heterogeneity of owners.

Using this framework Hansmann then explains the predominance of various organizational forms over a wide range of economic activities. He explains the dominance of customer cooperatives in the rural US as a consequence of their minimisation of the costs of both market power and regulation, and advantageous costs of ownership. The latter advantage arises due to the relative homogeneity of distribution service quality and rural distribution customers, as well as stable customer base, implying relatively low levels of inter-member conflicts and hence low costs of collective decision-making. Despite rural distribution's relatively high capital intensity (low customer density) compared with urban networks, it remains highly bankable and hence requires relatively little by way of member equity, reducing members' investment risk and mitigating well-known problems of cooperative member exit and entry (e.g. Evans and Guthrie (2002)).

By contrast he argues that municipal (i.e. local authority) owned utilities, in which customers have more diffuse control over the distribution activities mediated via local political processes, represent an efficient ownership solution to the greater heterogeneity and transience of urban customers. Both features increase scope for conflicts of interest among present and future customers, and hence imply higher costs of collective decisions, which must be weighed against the benefits of more direct customer ownership of distribution.

By extension, state ownership of distribution companies is an extreme example of municipal ownership. It involves

the weakest correlation between market power costs and compensatory customer returns via state ownership of any monopoly profits. It also involves the most attenuated customer participation in distribution company governance. In this case customer ownership is so indirect as to be an inefficient solution to market power abuse, suggesting a need for regulation. Should regulation be imposed in this case, however, the costs of state ownership must then be weighed against those of private ownership in determining distribution's optimal organizational form, given the costs of market power and regulation, with regulated non-customer private (i.e. investor) ownership being an obvious contender.

It should be noted that models of customer ownership are not confined to US-style non-profit customer cooperatives. Customer trust ownership of for-profit distribution companies, as in New Zealand, is another model. In certain circumstances cooperatives represent an efficient ownership form, but also feature well-known governance and hence efficiency problems (Hart and Moore (1998), Porter and Scully (1987)). The fact that they survive despite such deficiencies suggests the scale of the market power problems they address. Alternative forms of cooperative, such as those operating for-profit and allowing members to trade ownership at market value (*inter alia*) are predicted to result in greater efficiency (Cook and Iliopoulos (1999), Evans and Guthrie (2002)).

It is beyond the scope of this paper to survey the relative efficiencies of each ownership form, but sufficient to note that multiple classes of customer ownership are possible. We now compare selected permutations of ownership and regulation to help identify where ownership and regulation appear most substitutable, simply assuming some unspecified form of customer ownership as one alternative.

## 5. ASSESSING THE ALTERNATIVES

### 5.1. Relative Costs

Table 1 compares the relative combined governance costs arising under state,

investor and customer ownership, both with and without regulation. The cost classes chosen reflect dimensions materially different in each case, but ignore dimensions expected to be relatively alike under each scenario.

**Table 1.** Relative combined governance costs

Ownership Class, and Regulation	Cost Class		
	Market Power	Ownership	Price Regulation
State: • Regulated • Unregulated	Low ?	High High	Med. Nil
Investor: • Regulated • Unregulated	Low High	Low Low	High Nil
Customer: • Regulated • Unregulated	Low Low	Med. Med.	Med. Nil

### 5.2. State Ownership

Assuming regulation is effective, market power should be checked with regulation. Absent regulation the costs of market power under state ownership are unclear. Government may exploit market power for non-customer related (e.g. fiscal) goals, or weak ownership might foster monopolistic inefficiencies (e.g. X-inefficiency). Alternatively, state ownership might provide a buffer against market power abuse.

Ownership costs are relatively high due to higher agency costs and associated inefficiencies (e.g. more diffuse objectives, fewer managerial monitoring and incentive options, lack of takeover threat), and high costs of collective decision-making due to heterogeneous interests and variation in interest concentration.

Direct regulation costs should be lowest under state ownership. Indirect costs would be significant, although possibly less than under investor ownership due to its softer objectives dampening regulatory distortions (such as on investment). As for the other two ownership classes, no costs from price regulation arise in its absence.

### **5.3. Investor Ownership**

Market power costs are highest under unregulated investor ownership, in the main due to its tight profit focus. Assuming regulation is effective, these costs should be attenuated.

Conversely, investor ownership is argued to carry the lowest agency costs and associated inefficiencies, in the main due to its relatively tight objective function (profit maximisation) and greater array of options for monitoring, incentivizing and sanctioning management (e.g. alienable ownership, market for corporate control).

Regulation costs will be highest in this case, not only because the direct costs of regulation will be high, but also because regulatory distortions should be their worst with investor ownership's tight profit focus.

### **5.4. Customer Ownership**

Market power costs should be the lowest under customer ownership, whether or not there is regulation. Customers can influence the firm's objective function and/or share in any excess returns.

Ownership costs will lie between those of investor and state ownership, reflecting governance inefficiencies such as those noted for cooperatives, in part due to softer objectives and managerial disciplines, but also because of the conflicts of interest and higher collective decision-making costs arising with mixed owner-customer objectives and exacerbated by member heterogeneity and transience.

Regulation costs will be intermediate, since customer ownership's broader objectives and/or softer profit focus will dampen the effects of regulatory distortions. Regulated customer-owned firms, like investor-owned firms, otherwise bear the full costs of regulation.

### **5.5. Overall rankings**

For a local distribution concern customer ownership should be superior to state ownership whether price-regulated or not. This stems from lower ownership costs, likely comparable regulation costs, and uniformly low market power costs. The ownership cost advantage is primarily due

to superior governance arising from more direct customer-owner control, but possibly also in other agency cost and efficiency terms. It is perhaps for these reasons that state ownership of distribution, except via fully integrated electric utilities, is less common than municipal or customer ownership.

Despite the likely agency cost and efficiency advantages to investor ownership, once regulation costs are considered it is unclear whether regulated private ownership is superior to state ownership. This conclusion mirrors that of Laffont and Tirole (1991), and is consistent with the mixed empirical evidence on the relative performance of state- and investor-owned electric utilities (see the survey in Willner (2001)).

The clearest prediction is that regulated customer ownership should be a dominated ownership form, with unregulated customer ownership uniformly better or equal. In this case the costs of regulation are deadweight loss since ownership already resolves monopoly concerns, thus the imposition of regulation increases costs (including those of bankruptcy risks and investment distortions) without enhancing welfare.

Perhaps controversially, in the light of the significant costs of regulation it cannot be ruled out that unregulated investor ownership is just as preferable to state ownership as unregulated customer ownership. In this case market power costs will be higher, but the efficiencies of investor ownership may be sufficient to tip the balance. In political terms unregulated customer ownership would likely be a more defensible option.

## **6. EXTENSION TO TRANSMISSION**

For the same reasons that customer ownership can be an efficient solution to distribution's natural monopoly, it is natural to enquire as to whether this remains the case for upstream transmission. As noted earlier, US distribution cooperatives often combine to own upstream G&T cooperatives, in some cases continuing to avoid rate regulation. But what about direct customer ownership of transmission?

A significant difference between distribution and transmission is the former's location-specificity versus the latter's widespread (often national) coverage. This implies much greater ultimate customer heterogeneity, and coordination and investment issues, raising the costs of direct customer ownership – collective decision-making in particular. For this reason the balance of convenience might well shift from customer towards (unregulated) investor ownership, unless means were available to mitigate the higher costs of customer ownership for transmission.

Once again, the voluntary formation of cooperative-owned G&T cooperatives provides insight. The additional layer of governance between distribution cooperative customers and transmission managers raises the agency costs of ownership. However, a multi-lateral governance structure, via this intermediary layer, moderates collective decision-making costs and represents an efficient trade-off against the higher governance costs borne by customers through state or investor ownership of transmission. It also locates investment decisions near those bearing the costs of indecision and error.

This model reflects that recommended but never adopted in New Zealand, with 1989 recommendations that distribution companies “club” own the national grid operator (Evans and Meade (2005)). It also reflects the model temporarily adopted in the early 1990s in England and Wales, with regional electricity company (REC) ownership of the national grid company. In the former case the proposal failed in part due to distributor reluctance to finance the required purchase, and in the latter was abandoned amidst competition concerns associated with REC ownership of generation. As discussed in Evans and Meade (2005), there is good reason to separate generation ownership from any model of integrated transmission and distribution. Aside from the anti-competitive possibilities of subsidising competitive generation from monopoly operations, there is the additional problem of generators preferring grid congestion and inefficient grid investments (expanded on in Evans and Meade (2001)).

## 7. POLICY IMPLICATIONS AND CONCLUSIONS

Glachant (2002, 14)) notes that “some externalities and asset specificities can be managed within private clubs of partners or users, limiting the scope of intervention by public regulatory bodies.” The evidence and analysis above illustrates customer ownership solutions reducing the need for regulatory intervention. Indeed, it highlights the net welfare loss possible with the regulation of already-customer owned distribution and transmission. It also cautions against the automatic adoption of regulation where customer ownership options are feasible, since they may in fact be considerably more efficient than other ownership forms.

Furthermore, with unregulated customer ownership being an efficient “regulatory” option, there is merit in regulators offering regulatory “menus” conditioned on ownership. For example, where customer-owned distribution companies are offered for sale, regulation might be applied as a consequence of ownership passing to investors (or government). Based on the above, this imposition under even investor ownership may be welfare-reducing. Conversely, if control of investor-owned distribution passes to customers, this would justify the abandonment of regulation for so long as it persists (subject to anti-gaming provisions).

Finally, when electricity reformers consider unbundling options, this analysis implies that different issues arise depending on whether distribution (and transmission) are customer-owned or not. The general implication being that a uniform regulatory approach across all ownership classes is unlikely to be necessary or desirable.

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