

# ANNOTATED READING LIST FOR A BODY OF KNOWLEDGE ON INFRASTRUCTURE REGULATION

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## **Chapter VI. Quality, Social, and Environmental Issues**

### **Introduction**

Regulators often focus on issues of price, incentives, and market structure.<sup>1</sup> However, issues of service quality, achieving social objectives, and the environment – sometimes collectively called non-price issues – also receive considerable attention. As in the case of tariff design, there are instances in service quality, social, and environmental issues in which the interests of the operator and the interests of the government may coincide. An example is the case of prepaid cards for mobile service in telecommunications described in Chapter V. Telecommunications operators developed these cards without government direction and many among the poor are now able to have phone service as a result of these cards.

Situations, however, where the interests of the government differ from the interests of the operator.<sup>2</sup> For example, if the customers at the margin – i.e., the customers who are most indifferent about whether or not to purchase the service – are not very responsive relative to other customers to changes in service quality, then the operator has an incentive to under invest in quality. Furthermore, it may be difficult for customers to ascertain quality before making their consumption decision or to adjust their purchasing if quality is poor. In these situations the pricing mechanism does not provide the operator with an incentive to invest in the appropriate amount of quality.

Also, if the environmental impact of the utility service is an externality, then a profit-maximizing operator would under invest in environmental protection. An externality is an effect that is visited on someone who is not a party to the transaction. For example, if producing electricity causes air pollution, people who are not purchasing the electricity may suffer from the air pollution. Absent government intervention or some other extra-market effort, this pollution effect does not affect the operator's profits, so the operator does not make production decisions that are beneficial from a welfare perspective.

When the interests of the operator and the interests of the government do not coincide, the government may find it optimal to establish incentives for the operator to pursue the government's goals with respect to service quality, social issues, and the environment. These issues are considered in this chapter, as are service quality issues, environmental issues, and finally social issues. Following this chapter's narrative is a list of references, organized by topic.

### **Quality of Service**<sup>3</sup>

In certain instances, regulatory schemes that incent the operator to decrease costs also incent the operator to lower service quality. This may be especially true for access sold to rivals because the operator not only saves costs of quality, but the lower quality access also decreases

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<sup>1</sup> Pricing, incentive regulation, and market structure are covered in Chapters V, IV, and II respectively.

<sup>2</sup> See Chapter I for a discussion of the importance of asymmetries between the operator and the government.

<sup>3</sup> See Section A.

competitive pressure. The regulator may respond to these incentives by regulating service quality. Such regulations may take the form of minimum standards, rewards for improving quality, and penalties for substandard quality. Regulating service quality involves the steps of identifying the preferred level of service quality, designing a system for providing the operator with the incentive to offer this service quality, and developing a system for monitoring service quality and enforcing the standards.

The preferred level of service quality should reflect the value customers place on quality and the operator's cost of providing service quality. The appropriate level of quality equates marginal benefit and marginal cost.<sup>4</sup> In principle, the marginal benefit should be the marginal benefit to the average customer. This is difficult to determine in practice, but regulators nevertheless attempt to learn customer quality preferences through survey instruments, the complaint process, benchmarking studies, and choice of quality options. It is generally preferred that preferences be aggregated into a few indices that reflect the tradeoffs that customers make between various dimensions of service quality. This allows the operator to make economic tradeoffs when trying to achieve the preferred level of customer satisfaction in the least costly way. A customer tradeoff in service quality might be that the customer places more value on the purity of water than on consistent water pressure. The relative importance of these two dimensions of service quality would be reflected in their relative weights in the aggregate index. With respect to cost, the operator may find that achieving an incremental improvement in water purity is very costly, but that an incremental improvement in water pressure is inexpensive. The operator can offer customers and optimal balance of cost and quality if the operator has the flexibility to make production choices.

In some situations, it may be optimal for operators to offer grades of service, so that each customer can choose the service quality that best serves her need. This approach overcomes the need to identify the marginal benefit for the average customer because individual customers reveal their preferences in the purchasing choices that they make. The levels of quality offered and the prices charged should reflect both the marginal costs of quality and differences in customers' quality preferences. Price differences will generally be greater than the differences in marginal cost. If the operator failed to deliver the promised quality, customers would receive a refund based on the price paid and the price that would have been paid for the lower quality level, if the customer had chosen it.

Regulators can economize on costs of regulating service quality by monitoring a small number of quality indicators on a regular basis. These indicators may be sufficient for determining whether there is a quality problem. Once a problem is indicated, a more thorough analysis, including collection of additional data, can be done.

The enforcement of service quality standards commonly occur annually or at price reviews, but other options are available. If quality is a problem, frequent monitoring may be in order because waiting to address the problem until the next price review might allow the problem to persist too long.

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<sup>4</sup> Chapter V describes marginal cost and how regulators estimate marginal cost.

Penalties for low service quality should reflect the customers' loss of value. Conversely, rewards for exceeding service quality standards should reflect customers' gain in value. (Where feasible, offering customers a menu of options eliminates the need to quantify penalties and rewards.) Publishing statistics of operator performance can provide a powerful incentive to meet quality standards, especially if there is competition. This can be particularly useful when services take on the characteristics of what economists call experience goods, which means that customers cannot determine service quality unless they actually purchase and use the service. Publishing service quality monitoring results lets prospective customers learn what existing customers experience and make effective choices among service providers in situations where customers have competitive choices.

In some situations poor customers cannot afford cost-based prices for service that is equal in quality to that purchased by the general population. Regulators sometimes respond to this situation by allowing the operator to offer lower quality services to poor customers. Operators choosing this approach may find it profitable to serve poor customers, which would make both the poor and the operator better off. Section C in this chapter contains information on pro-poor policies. Chapter V Section C provides information on pricing for the poor.

### Environmental and Safety Issues<sup>5</sup>

The three main trends in environmental regulation in recent years have been: (a) a shift from command and control regulation towards economic instruments that provide incentives for operators to choose optimal investments in environmental protection; (b) an increasing availability of information on the monetary value of environmental costs and benefits; and (c) an increasing tendency for environmental objectives to be determined in international fora. In addition, interactions between environmental regulation and utility regulation have grown in importance. There are a number of important interactions between the economic and environmental regulation of these sectors:<sup>6</sup> (a) environmental regulations may be a critical determinant of investment programs; (b) the rate setting process may affect a regulated company's incentives to respond to economic instruments; and (c) the economic regulator may be particularly well-placed to deal with certain sector specific environmental problems.

Despite the trend towards the use of economic incentives, there remains a predominance of command and control in environmental regulation in which the government establishes standards and a penalty system for enforcing the standards. Even command and control systems can operate as incentive systems because operators sometimes weigh the costs of compliance against the costs non-compliance in making their production decisions. As a result, governments often carefully weigh the costs and benefits of environmental regulations to ensure that customers and citizens receive a net benefit from the regulations. The regulator may be involved in this cost-benefit analysis because of the regulator's expertise in understanding operator costs.

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<sup>5</sup> See Section B.

<sup>6</sup> See Chapter I Section C, and Sections B and L of Chapter III for information on roles for utility regulators and relationships with other government agencies.

The interactions between economic and environmental regulation raise several issues. For example, they raise the question as to whether the economic and environmental regulation of the water and energy sectors should be institutionally integrated.<sup>7</sup> Also, regulatory policies for rate setting affect the operator's incentives in complying with environmental regulations.<sup>8</sup> One option for dealing with externalities in rate setting is to allow full pass through of externality charges. However, this reduces the operator's incentives to reduce its creation of externalities. Another option is for the regulator to forecast the cost of controlling the externality and to adjust the price-cap accordingly.<sup>9</sup> A third approach would be to allow partial pass through of the externality cost.<sup>10</sup> In some cases, the regulator may be able to shift the externality charge on to the users, rather than to the operator. This might be appropriate if customer demand is the primary driver of the externality and the operator cannot affect the amount of the externality nor its cost.

### Social Aspects<sup>11</sup>

Social issues generally focus on access to and affordability of a service.<sup>12</sup> Some countries address these issues by including access or connection targets in concession contracts. This avoids trying to set up subsidy mechanisms later because the operator can consider the cost of the obligation at the time of bidding on the contract. However, once the contract is given the operator has an incentive to try to renegotiate or renege on the obligation, so monitoring and enforcement procedures, as well as evaluation criteria for the scheme itself, should be set out at the time of bidding.<sup>13</sup> The service obligation is generally based on what customers need and would be willing to pay, but for their poverty.

Sometimes service can be made affordable by changing price structures, as Chapter V on Tariff Structure discusses. For example, poor customers can sometimes afford cost-based usage fees, but not cost-based initial connection fees. In these situations, it may be optimal for the operator to provide customers with the option of paying their connection fee over time, perhaps through usage fees.<sup>14</sup> Customers may also prefer prepaid service, which allows customers to use only what they can afford. This has proven successful with mobile telephone service.

In other instances, the social policy for the poor uses an explicit subsidy. Not disconnecting households for non-payment is a form of subsidy. When the subsidy is included in a concession contract, the operator commits to a certain number of connections and a retail tariff in exchange for a subsidy. The concession, which may not be exclusive, is awarded to the operator asking for the lowest subsidy. Chile and other countries have applied this for establishing telecommunications in remote areas. Another strategy is for the country to provide consumption subsidies directly to customers.

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<sup>7</sup> See Chapter I Section C and Chapter III Section B for information on roles of regulators and the scope of regulatory institutions.

<sup>8</sup> See Chapter IV for information on regulating the overall price level and Chapter V for information on price design.

<sup>9</sup> See Chapter IV Section B for details on price cap regulation.

<sup>10</sup> See Chapter IV Section A for information on other cost pass-through issues.

<sup>11</sup> See Section C.

<sup>12</sup> See Chapter V Sections C and E for information on pricing for the poor and funding subsidies for the poor.

<sup>13</sup> See Chapter II Section C for information on renegotiation of concessions and franchises. See Chapter VII for information on negotiation processes.

<sup>14</sup> See Chapter V Sections A and B for information on optional tariffs.

Some regulators have found that, *ceteris paribus*, it is better to subsidize access than consumption. These regulators have found that access subsidies are superior to usage subsidies for encouraging poor customers to obtain access. It also encourages efficient usage because consumers base their consumption decisions on prices that reflect marginal costs. If consumption is subsidized, regulators generally limit the subsidy to a specified level of usage considered adequate to promote universal access.<sup>15</sup>

If subsidies are to be used, the regulator or policy maker should establish methods for determining the amount of the subsidy, how funding for the subsidy will be collected, and how the subsidy will be distributed. It is generally accepted that the amount of subsidy should be the difference between the incremental cost of providing the service and the customer's ability to pay. In other words, the amount of subsidy should be just enough to ensure that the service provider does not receive a negative profit from serving the targeted customer, including any cross-elastic effects.<sup>16</sup> Funds should be collected and distributed in the least distortive manner. If markets are competitive, this means that the fund collection and distribution should be done in a competitively neutral manner. In monopoly markets, operators can efficiently internalize the subsidy, but the competition for the market should be competitively neutral. A transparent subsidy system may be more necessary than in monopoly markets.

As explained previously, a case can be made that subsidy schemes should have sunset provisions, be separately funded from the regulatory system, and be administered by an agency separate from the regulatory agency. The sunset provision forces a conscious decision to continue the scheme, which should be more effective at ensuring a substantive review than would be allowing the scheme to continue indefinitely. Furthermore management and funding of the scheme by the infrastructure regulator might inappropriately tie the subsidy to regulated services, which may not be the most cost effective for serving the poor.

### Concluding Observations

Experience is demonstrating that competition is an important instrument for service quality and social issues. Competition may not result in operators offering the optimal quality, but it is difficult for regulators to improve on competitive market results without significant information on customers' willingness to pay for quality. Competition provides operators with incentives to develop services, service qualities, and pricing arrangements that make services to the poor commercially viable. In situations where commercially viable services to the poor are technically infeasible, then subsidies may be needed. Competitive markets may also contribute to resolving some environmental issues if regulators and policy makers can create markets that allow operators to internalize the environmental externalities.

Regulators need information on operators and markets to optimally solving both price and non-price issues. Chapter III describes ways that regulators collect and manage information.

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<sup>15</sup> The authors thank Winston Hay for this insight.

<sup>16</sup> A cross-elastic effect occurs when a change in the output of one service changes the demand or cost of another service. For example, an increase in the output of telecommunications sometimes causes an increase in the demand for electricity.

## Case Studies

Covarrubias, Alvaro J. and Kilian Reiche, “A case study on exclusive concessions for rural off-grid service in Argentina,” in Energy Services for the World’s Poor, Washington, D.C.: The World Bank, 2000, pp. 84-90.

Econ One Research, Inc. and ESG International, “Uganda Telecommunications: A Case Study in the Private Provision of Rural Infrastructure,” July 30, 2002.

Economic Consulting Associates and Mercados de Energia S.A., “Emerging Lessons in Private Provision of Rural Infrastructure Services: Final Report – Guatemala,” the World Bank, August 2002.

Foster, Vivien and Caridad Araujo, “Does Infrastructure Reform Work for the Poor? A Case Study from Guatemala,” The World Bank, December 2001.

Galperin, Hernan, and Bruce Gerard, “Microtelcos in Latin America and the Caribbean,” in A.K. Mahon and W.H. Melody, eds. Diversifying Participation in Network Development, Montevideo, Uruguay: World Dialogue on Regulation, 2007, pp. 111-120.

Hankins, Mark, “A case study on private provision of photovoltaic systems in Kenya,” in Energy Services for the World’s Poor, Washington, D.C.: The World Bank, 2000, pp. 92-99.

Jadresic, Alejandro, “A case study on subsidizing rural electrification in Chile,” in Energy Services for the World’s Poor, Washington, D.C.: The World Bank, 2000, pp. 76-82.

Ofgem, “Development of Multiple Interruption and Other Standards for Electricity Distribution: Consultation on Draft Determination of Overall Standard and Implementation Arrangements for Guaranteed Standard,” March 2004.

OFWAT Final Determinations. Future Water and Sewerage Charges 2000-05: Periodic Review 1999. November 1999.

OFWAT Setting water and sewerage price limits for 2005-10: Framework and Approach. Periodic Review 2004. March 2003.

OFWAT, Ofwat Annual Report 2003-2004, 2004.

Pennsylvania Public Utilities Commission, 2002 Customer Service Performance Report: Pennsylvania Electric Distribution Companies & Natural Gas Distribution Companies, 2003.

Pennsylvania Public Utilities Commission, Report on 2002 Universal Service Programs & Collections Performance of the Pennsylvania Electric Distribution Companies & Natural Gas Distribution Companies, 2003.

Serra, Pablo, "Subsidies in Chilean Public Utilities," World Bank Policy Research Working Paper No. 2445, 2000.

Tremolet, Sophie and Joanna Neale, "Emerging Lessons in Private Provision of Infrastructure Services in Rural Areas: Water and Electricity Services in Gabon," The World Bank, Reference No. 8524, September 2002.

Table 6. Chapter VI Cases by Topic Area

	Cases														
	Covarrubias and Reiche, 2000.	Econ One Research, Inc. and ESG International, 2002.	Economic Consulting Associates and Mercados de Energia S.A., August 2002.	Foster and Araujo, 2001.	Galperin and Gerard, 2007	Hankins, 2000.	Jadresic, 2000.	Ofgem, 2004.	OFWAT, 1999.	OFWAT, 2003.	OFWAT, 2004.	Pennsylvania Public Utilities Commission, 2003a.	Pennsylvania Public Utilities Commission, 2003b.	Serra, 2000.	Tremolet and Neale, 2002.
<u>Chapter VI. Quality, Social, and Environmental Issues</u>															
A. Quality of Service								X	X	X		X			
B. Environmental and Safety Issues											X				
C. Social Aspects	X	X	X	X	X	X	X						X	X	X

## References

### A. Quality of service

#### 1. Rationale for regulation of quality of service

##### Core References

Baldwin, Robert, and Martin Cave, Understanding Regulation: Theory, Strategy, and Practice, Oxford: Oxford University Press, 1999, Chapter 19.

Describes regulation of service quality. Considers quality parameters, performance targets, economics of quality, and ways to value quality.

Forsyth, P., "Environmental Externalities, Congestion and Quality under Regulation," in Infrastructure Regulation and Market Reform: Principles and Practice, edited by Margaret Arblaster and Mark Jamison. Canberra, Australia: ACCC and PURC, 1998, pp. 185-196.

Argues that price cap regulation creates an incentive for the firm to supply a less than optimal level of quality, especially when access prices are regulated. Explains that congestion is essentially another aspect of quality, one that depends on the relationship of demand to capacity. Holds that because the firm cannot convert reductions in congestion into higher revenue because its price is capped, the firm has an incentive to provide too little capacity and allow congestion to be inefficiently high.

Green, Richard, and Martin Rodriguez Pardina. Resetting Price Controls for Privatized Utilities: A Manual for Regulators. Washington, D.C.: World Bank, 1999, Chapter 8.

States that price controls provide an incentive to the firm to reduce quality, so performance standards may be necessary. Explains methods of control.

Kahn, Alfred. The Economics of Regulation: Principles and Institutions. Cambridge, MA: MIT Press, 1988, Reissue Edition, vol. I, Chapter 2.

Explains why regulators should pay attention to the regulation of quality.

##### Sectoral References

ELECTRICITY

Meyrick and Associates, Electricity Service Quality Incentives Scoping Paper, Prepared for: Queensland Competition Authority, 4 July 2002.

Argues that price cap regulation provides incentives for the firm to decrease quality.

Ofgem, “Development of Multiple Interruption and Other Standards for Electricity Distribution: Consultation on Draft Determination of Overall Standard and Implementation Arrangements for Guaranteed Standard,” March 2004.

Summarizes responses on proposed Multiple Interruption performance standards in electricity distribution.

#### TRANSPORTATION

Estache, Antonio Privatization and Regulation of Transport Infrastructure: Guidelines for Policymakers and Regulators World Bank Institute Development Study, World Bank, Washington, D.C., 2000.

Discusses price and quality regulation issues that characterize the transport sectors.

CPCS Transcom, Urban Bus Toolkit: Tools and Options for Reforming Urban Bus Systems Public-Private Infrastructure Advisory Facility, World Bank.

Offers practical advice to enact fundamental system reforms.

Kerf, Michael et al. Concessions for Infrastructure: A Guide to Their Design and Award Finance, Public Sector, and Infrastructure Network, WTP 399, World Bank, Washington, D.C., 1998.

Provides a guide to the complex range of issues and options related to design, award, implementation, monitoring, and modification of concessions.

#### WATER

Savedoff, William, and Pablo Spiller. “Government Opportunism and the Provision of Water,” in Spilled Water: Institutional Commitment in the Provision of Water Services, edited by William Savedoff and Pablo Spiller. Washington, D.C.: Inter-American Development Bank, 1999, pp.1-34.

Discusses the causes of leakage, linking the problem with issues of commitment, opportunism, and finances. Describes the political context of water services and determinants of becoming stuck in an equilibrium that provides poor service. Discusses how to overcome these problems and ways of sustaining success.

Shirley, Mary M., and Claude Ménard. "Cities Awash: A Synthesis of the Country Cases," in Thirsting for Efficiency, edited by Mary M. Shirley. Washington, D.C.: The World Bank, 2002, pp.1-41.

Discusses quality issues in the context of yardstick competition, monitoring, performance targets, assignment of risks and rewards, incentives in tariff policies, and the roles of regulatory, judicial, and political institutions.

### **Key Words**

Access pricing, Service quality, Customer value, Incentives

## **2. Developing a framework for quality of service regulation**

### **Core References**

Arblaster, Margaret, "Quality of Service Monitoring: Utility Regulators Forum," Discussion Paper prepared for the Australian Competition and Consumer Commission, Victoria, Australia, 1999.

Outlines several features of an effective monitoring program. Discusses periodic reporting, explanations and justifications by service providers, roles of complaints-handling bodies and relevant regulators, and benchmarking studies and audits.

Forsyth, P., "Environmental Externalities, Congestion and Quality under Regulation," in Infrastructure Regulation and Market Reform: Principles and Practice, edited by Margaret Arblaster and Mark Jamison. Canberra, Australia: ACCC and PURC, 1998, pp. 185-196.

States that regulation of quality is the most difficult problem regulators face because regulation breaks the nexus between price and quality. Further states that typically there is an attempt to identify what physical aspects of quality are important. Discusses relevant quality indicators and trade-offs.

Kahn, Alfred. The Economics of Regulation: Principles and Institutions. Cambridge, MA: MIT Press, 1988, Reissue Edition, vol. I, Chapter 2, vol. II, Chapter 5.

Explains why regulators should pay attention to the regulation of quality. Explains the relationship between quality and the concept of destructive competition.

### **Sectoral References**

#### ELECTRICITY

Bakovic, T., B. Tenenbaum, and R. Woolf, "Regulation by Contract: A New Way to Privatize Electricity Distribution?" Energy and Mining Sector Board Discussion Paper Series Paper no. 7, March 2003.

Describes quality and performance targets for electricity distribution. Provides country examples.

Council of European Energy Regulators, Quality of Electricity Supply: Initial Benchmarking on Actual Levels, Standards and Regulatory Strategies, 2001.

State that quality of service regulation should relate to transactions between companies and customers (for example, accuracy of estimated bills and actual meter readings), continuity of supply (for example, planned or unplanned service, their duration, and low voltage levels), and voltage quality.

Meyrick and Associates, Electricity Service Quality Incentives Scoping Paper, Prepared for: Queensland Competition Authority, 4 July 2002.

Details recommendations for focusing on performance standards most valued by customers.

#### TELECOMMUNICATIONS

Berg, Sanford, and John Lynch, "The Measurement and Encouragement of Telephone Service Quality," *Telecommunications Policy* 16(3): 1992, pp. 210-24.

Details an overall assessment index that combines multiple dimensions of quality, assigns weights to them (based on importance to customers), and aggregates the weights into a single score. Explains that this approach simplifies review of the company's performance and the company can be afforded flexibility to respond to technological advances

and invest in those services that enhance its own self-interests and those of its customers.

## WATER

OFWAT Updating the Overall Performance Assessment (OPA) – A Consultation.  
December 2003.

Examines alternative performance measures for water utilities. Considers weighting of measures, performance ranges, funding of enhanced service levels, water supply measures, drinking water quality, sewerage service measures, customer service measures, and environmental performance measures.

OFWAT, Linking service levels to prices, February 2002.

Examines policies for linking service levels to prices. Considers incentives that regulation creates for service (formal linkages and regulatory lag), weighting measures, differentiating between operators, and parameters for water supply, sewage, customer service, and environmental.

### Key Words

Access pricing, Service quality, Customer value, Incentives, Benchmarking, Incentive regulation, RPI – X regulation

### 3. **Developing and introducing performance standards**

#### Core References

Arblaster, Margaret, “Quality of Service Monitoring: Utility Regulators Forum,” Discussion Paper prepared for the Australian Competition and Consumer Commission, Victoria, Australia, 1999.

Describes a general framework in which performance indicators serve as “triggers” to amassing additional information. Explains that information must be reliable, verifiable, and subject to periodic review. Also explains that publishing findings of the company’s performance requires regulators to determine how that information should be imparted, the breadth of the disclosure, the intended audience, mitigating circumstances that might affect the data, which agency(s) has responsibility for ultimate oversight, and the timing of report releases.

Baldwin, Robert, and Martin Cave, Understanding Regulation: Theory, Strategy, and Practice, Oxford: Oxford University Press, 1999, Chapter 19.

Describes regulation of service quality. Considers quality parameters, performance targets, economics of quality, and ways to value quality.

Green, Richard, and Martin Rodriguez Pardina. Resetting Price Controls for Privatized Utilities: A Manual for Regulators. Washington, D.C.: World Bank, 1999, Chapter 8.

Explain that one possible approach to regulating service quality is to collect and publish data on the company's overall performance against a range of indicators, which may be most effective if there are several companies or if tougher price controls are threatened for the future unless standards improve. Describe a second method, which is to compensate consumers who are the victims of bad service. A third method is to include a direct link between the company's allowable revenue and its quality of service in the price control formula, which may be particularly beneficial in areas unsuited to individual compensation payments, such as fluctuations in voltage.

### **Sectoral References**

#### ELECTRICITY

Bakovic, T., B. Tenenbaum, and R. Woolf, "Regulation by Contract: A New Way to Privatize Electricity Distribution?" Energy and Mining Sector Board Discussion Paper Series Paper no. 7, March 2003.

Explains that quality-of-service standards and associated penalties and rewards may be phased-in over time; however with regulation by contract, standards may not be changed during a multi-year tariff period unless the changes were pre-specified at the beginning of the tariff period or are agreed to by the licensee. Considers how standards may be based on the licensee's own past performance or the performance of other comparable licensees in the country and elsewhere in the world. Describes characteristics of a monitoring system and the system's purpose. Explains that the licensees should be allowed to recover costs of quality and compliance in their tariffs.

Davis, Ron, "Acting on Performance-Based Regulation," *Electricity Journal* 13(4): 2000, pp. 13-23.

Holds that performance standards should be set with respect to reliability, customer call centers, employee safety, and billing and customer complaints. Recommends that measures and targets to improve service quality be consistent with the company's business plan and long-term interests. States that in developing performance standards, an electric utility should: 1) understand its historic performance in order to develop an appropriate baseline for yardstick comparisons; 2) determine those areas where cost savings may be realized and quality may be approved; and 3) begin collecting information on service quality and develop measures to be used for benchmarking performance.

Meyrick and Associates, Electricity Service Quality Incentives Scoping Paper, Prepared for: Queensland Competition Authority, 4 July 2002.

Describes sequential process for designing incentive schemes. Victoria, Australia, set minimum reliability standards for its distributors differentiating between short and long feeders, and in 2001 they plan to introduce quality incentives directly into the CPI – X price cap regulation as well as forcing payments to affected consumers. In South Australia, utilities receive points for quality achievements relative to specified targets.

Williamson, Brian, "Incentives for Service Quality: Getting the Framework Right," *Electricity Journal* 14(5): 2001, pp. 62-70.

Explains that to provide proper incentives, regulators should focus on all dimensions of quality that customers value directly and that can be expressed as objective, observable, and verifiable performance measures, not use comparative performance, establish a baseline, base the reward on the current level of quality, use a symmetric approach, consider capping rewards and penalties, and ensure that if an overall service quality index is used.

#### TELECOMMUNICATIONS

Berg, Sanford, and John Lynch, "The Measurement and Encouragement of Telephone Service Quality," *Telecommunications Policy* 16(3): 1992, pp. 210-24.

Provides a critique of the pass/fail minimum standards where regulators generally impose penalties for the performance of telephone companies below a targeted level but do not reward superior performance. In effect, they establish an asymmetric incentive system, giving companies little reason to surpass the minimum established benchmarks and respond effectively to technological changes in the industry.

Oodan, A.P., K.E. Ward, and A.W. Mullee, Quality of Service in Telecommunications, London: Institute of Electrical Engineers, 1997.

States that key steps for establishing a framework for regulation of service quality include developing a matrix to derive relevant quality of service criteria, identifying methods of determining customers' quality requirements and perceptions, identifying problems encountered in service-level agreements, outlining the process used by monitoring systems, identifying ways of protecting interconnected networks and testing interoperability, identifying cost drivers that contribute to network failures and heavy traffic congestion, and summarizing efforts of various organizations and countries to standardize measures for benchmarking purposes. Holds that regulators should publish quality information.

#### TRANSPORTATION

Rebelo, Jorge M. Benvenuto, Pedro P. *Concessions of busways to the private sector: the Sao Paulo Metropolitan Region experience*. Produced by: Policy Research Working Papers, World Bank , 1995.

Examines project in Sao Paulo, Brazil. Tender documents for ten bus corridors (one state and nine municipal) and rules for private concerns to bid for implementing and operating trunkline services are discussed.

#### WATER

OFWAT Final Determinations. Future Water and Sewerage Charges 2000-05: Periodic Review 1999. November 1999.

Identifies performance standards and their rationale in U.K. water.

OFWAT Setting water and sewerage price limits for 2005-10: Framework and Approach. Periodic Review 2004. March 2003.

Describes quality standards and how they are incorporated into the 2004 price review.

#### **Other References**

Kingdom, Bill, and Vijay Jagannathan, "Utility Benchmarking," Viewpoint, Note No. 229. Washington, D.C.: World Bank Group, March 2001.

Says benchmarking can include quality, efficiency, affordability, or other aspects of performance that are conducive to comparative analysis.

### **Key Words**

Service quality

## **4. Strategies to provide consumers' choice on QOS standards/price options**

### **Core References**

Baker, Bill, and Sophie Tremolet, "Regulating Quality." Note no. 221 in Public Policy for the Private Sector. Washington, D.C.: World Bank Group, October 2000.

State that quality is often a matter of consumer choice, so offering different levels of quality in such instances is equivalent to changing the economic value of the service, so the regulator should expect a different willingness to pay from each customer or group of customers. Recommends that regulators allow for the delivery of various price and quality bundles.

Meyrick and Associates, Electricity Service Quality Incentives Scoping Paper, Prepared for: Queensland Competition Authority, 4 July 2002.

Explains that higher reliability can be achieved for customers who choose such an option for a higher price by providing them with a primary selective service where they have access to multiple feeders so they are less susceptible to one feeder failing. Further explains that reliability guarantees are another variant on the price/service-offering concept. Information asymmetries and the resulting free-rider problem create problems.

### **Sectoral References**

TRANSPORTATION

Bureau of Infrastructure, Transport and Regional Economics (BITRE). *Working Paper 54 - Regional Public Transport in Australia: Economic Regulation and Assistance Measures*. Government of Australia. April 2003.

Provides information on Commonwealth, State and Territory government regulatory arrangements and assistance measures relating to regional public transport in 2001-02.

## WATER

OFWAT, Linking service levels to prices, February 2002.

Examines policies for linking service levels to prices. Considers incentives that regulation creates for service (formal linkages and regulatory lag), weighting measures, differentiating between operators, and parameters for water supply, sewage, customer service, and environmental.

OFWAT Updating the Overall Performance Assessment (OPA) – A Consultation. December 2003.

Examines alternative performance measures for water utilities. Considers weighting of measures, performance ranges, funding of enhanced service levels, water supply measures, drinking water quality, sewerage service measures, customer service measures, and environmental performance measures.

### Key Words

Benchmarking, Incentive regulation, RPI – X regulation, Service quality

## 5. Penalties and incentives for compliance with QOS standards

### Core References

Arblaster, Margaret, “Quality of Service Monitoring: Utility Regulators Forum,” Discussion Paper prepared for the Australian Competition and Consumer Commission, Victoria, Australia, 1999.

Provides a framework that regulators can use to monitor quality of service. Methods discussed for securing compliance with regulatory requirements include: comparative performing (benchmarking), enforcement of service standards through statutory penalties, price controls that include price adjustment mechanisms if performance falls below or exceeds benchmarks (depending upon whether a symmetric or asymmetric reward system is adopted), guaranteed payment requirements if performance fails to meet minimum standards, and prospective

sanctions from courts or complaint handling bodies if the company's performance results in loss or damages.

OFWAT, Linking service levels to prices, February 2002.

Examines policies for linking service levels to prices. Considers incentives that regulation creates for service (formal linkages and regulatory lag), weighting measures, differentiating between operators, and parameters for water supply, sewage, customer service, and environmental.

### **Sectoral References**

#### ELECTRICITY

Bakovic, T., B. Tenenbaum, and R. Woolf, "Regulation by Contract: A New Way to Privatize Electricity Distribution?" Energy and Mining Sector Board Discussion Paper Series Paper no. 7, March 2003.

Explains that, after a phase-in period, sanctions or penalties may be imposed for failure to meet pre-specified quality-of-service standards. Penalties should be related to estimates of the disutility experienced by the customer (based, where feasible, on estimates of the cost to the customer of not being served) and the costs likely to be incurred by the licensee in meeting the standards. Rewards may be granted. Penalties may be paid to individual consumers or to a general fund, administered by the Commission, which can be used to provide subsidies to economically disadvantaged customers.

Meyrick and Associates, Electricity Service Quality Incentives Scoping Paper, Prepared for: Queensland Competition Authority, 4 July 2002.

Explains that utilities in the U.K. have faced fines and forced compensation to consumers for failure to meet quality targets. At the time of publication, regulators in the U.K. planned to introduce a reward system based on performance relative to an estimated cost-quality frontier, though that plan was criticized for not taking account of consumer willingness to pay. The regulator of San Diego Gas & Electric used 'performance-based ratemaking', which uses financial incentives and disincentives to influence utility behavior in the desired direction.

#### TRANSPORTATION

World Bank Transport Group, Port Reform Toolkit, 2<sup>nd</sup> Edition Public-Private Infrastructure Advisory Facility, World Bank.

Provides guidance for undertaking sustainable and well-considered reforms of public institutions that provide, direct, and regulate port services in developing countries.

Groupe Egis and Courdert Brothers, Toolkit on Public-Private Partnerships in Highways Public-Private Infrastructure Advisory Facility, World Bank.

Provides low- and middle- income countries guidance in the design and implementation of Public-Private Partnerships in the highway sector. Covers all types of road projects and both with and without private funding.

CPCS Transcom, Urban Bus Toolkit: Tools and Options for Reforming Urban Bus Systems Public-Private Infrastructure Advisory Facility, World Bank.

Provides guidance on evaluating existing and alternative urban bus systems in developing and transitional countries. Offers practical advice to enact fundamental system reforms.

Kopicki, Ron and Louis Thompson Best Methods of Railway Restructuring and Privatization CFS Discussion Paper Series, number 11, World Bank, Washington, D.C., 1995.

Provides context and guidance to public policymakers and railway executive managers to restructure the railways. Addressed are the distinct structural issues associated with rail enterprise reform, the design of specialized intermediary institutions that carry out much of the work of railway restructuring, and the management techniques that are appropriately adapted to railway reform and restructuring. Focuses on "best" methods and is built on seven case studies of recent railway restructuring efforts. The case studies cover Japan National Railway, New Zealand Railways, Argentina Railways, Swedish Railways, British Railways, and railroads in the United States, and Canadian Railways.

## WATER

OFWAT, Linking service levels to prices, February 2002.

Examines policies for linking service levels to prices. Considers incentives that regulation creates for service (formal linkages and regulatory lag), weighting measures, differentiating between operators,

and parameters for water supply, sewage, customer service, and environmental.

OFWAT Updating the Overall Performance Assessment (OPA) – A Consultation.  
December 2003.

Examines alternative performance measures for water utilities. Considers weighting of measures, performance ranges, funding of enhanced service levels, water supply measures, drinking water quality, sewerage service measures, customer service measures, and environmental performance measures.

## **6. Incorporation of QOS issues into price reviews**

### **Core References**

Baldwin, Robert, and Martin Cave, Understanding Regulation: Theory, Strategy, and Practice, Oxford: Oxford University Press, 1999, Chapter 19.

Explains the conceptual attractiveness of linking changes in service quality levels to the price cap formula, but that such an approach could result in an oversupply or undersupply in quality levels if the marginal costs or benefits are estimated incorrectly and lead, in turn, to selection of an inappropriate quality coefficient in price cap formula. Identifies another problem, namely the difficulty of ensuring that all attributes of quality (since quality is multidimensional) are adequately captured in the price cap formula. Omission of any attribute might lead to quality deterioration.

### **Sectoral References**

ELECTRICITY

Meyrick and Associates, Electricity Service Quality Incentives Scoping Paper, Prepared for: Queensland Competition Authority, 4 July 2002.

State that rewards and penalties should reflect the marginal willingness to pay for quality while exceeding the marginal cost of supplying it, and in the first scheme penalties and rewards should be capped. These incentives should be included in the revenue cap of the form  $CPI - X + S$ , where  $S$  is a service quality parameter. Considers design issues.

## WATER

OFWAT Final Determinations. Future Water and Sewerage Charges 2000-05: Periodic Review 1999. November 1999.

Describes quality improvement programs and their linkages with the price review.

OFWAT Setting water and sewerage price limits for 2005-10: Framework and Approach. Periodic Review 2004. March 2003.

Describes quality parameters and how they are incorporated in the 2004 price review.

### **Key Words**

Information disclosure, Monitoring, Sanctions, Benchmarking, Incentive regulation, RPI – X regulation, Service quality

## **7. Effects of Competition on service quality**

### **Core References**

Baker, Bill, and Sophie Tremolet, “Utility Reform: Regulating Quality Standards to Improve Access for the Poor.” Note no. 219 in Public Policy for the Private Sector. Washington, D.C.: World Group, October 2000.

Explains why quality standards, as part of privatization efforts, are generally set high for utility providers in developing countries. States that: (1) Regulator can authorize alternative providers to supply services at lower prices than the incumbent carrier; (2) Another option is to allow the carrier to offer diversified services assuming such services lend themselves to differentiated tariffs and the targeted group for the lower-price, lower-quality services can be identified; (3) Contracts between the government and provider should explicitly authorize flexible choice arrangements, including flexible payment arrangements, so that providers are not penalized for offering differentiated services.

Kahn, Alfred. The Economics of Regulation: Principles and Institutions. Cambridge, MA: MIT Press, 1988, Reissue Edition, vol. II, Chapter 5.

Discusses linkage between service quality and the concept of destructive competition.

## **Sectoral References**

### TELECOMMUNICATIONS

Roycroft, Trevor R., and Martha Garcia-Murrilo, "Trouble Reports as an Indicator of Service Quality: The Influence of Competition, Technology, and Regulation," *Telecommunications Policy* 24(10-11): 2000, pp. 947-967.

Shows that companies subject to competition invest in quality to differentiate products.

### TRANSPORTATION

World Bank and Sub-Saharan Africa Transportation Project Africa Infrastructure Country Diagnostic: Stuck in Traffic: Urban Transport in Africa Working Paper number 44980, World Bank, Washington, D.C., 2008.

Summarizes recent research on urban transport in 14 large African cities. Provides comprehensive overview of the state of urban transport in Africa, with a view to drawing out the main challenges facing the sector and illustrating the different ways in which these have been addressed.

## **Key Words**

Information disclosure, Monitoring, Sanctions

## **8. QOS standards and the poor**

### **Core References**

Baker, Bill, and Sophie Trémolet, "Regulating Quality." Note no. 221 in Public Policy for the Private Sector. Washington, D.C.: World Bank Group, October 2000.

Explains that quality is often a matter of consumer choice. Furthermore, offering different levels of quality in such instances is equivalent to changing the economic value of the service, so the regulator should expect a different willingness to pay from each customer or group of customers. Explains that if a private provider wants to serve the poor and remain profitable, it must diversify its pricing or supply arrangements, or both. Also, while data on poor consumers is scant, studies suggest that

they are willing to pay a higher percentage of their income for infrastructure services than the rich—a measure of their desire for service.

Baker, Bill and Sophie Trémolet, “Utility Regulation: Regulating Quality Standards to Improve Access for the Poor Utility Reform,” in Public Policy for the Private Sector. Note No. 219. Washington, D.C.: World Bank, October 2000.

Explains why quality standards, as part of privatization efforts, are generally set high for utility providers in developing countries and that these higher standards often result in higher costs for services, thus reducing access of low-income households to those services. An example of a government’s agreement with alternative providers was an experiment in Buenos Aires in Barrio San Jorge. Residents paid a higher fee for water from the piped network or a lower fee for water drawn from groundwater sources that was too salty for drinking but was acceptable for other purposes.

Chisari, Omar O., Antonio Estache, and Catherine Waddams Price, “Access by the Poor in Latin America’s Utility Reform Subsidies and Service Obligations,” Discussion Paper No. 2001/75, World Institute for Development Economics Research, United Nations University, Helsinki, September 2001.

Discusses access and affordability for the poor. Cheaper technologies and various financing/lending schemes can lower costs for serving the poor, which increases access and affordability. Examines Latin American experiences.

## **Sectoral References**

### ELECTRICITY

Bakovic, T., B. Tenenbaum, and R. Woolf, “Regulation by Contract: A New Way to Privatize Electricity Distribution?” Energy and Mining Sector Board Discussion Paper Series Paper no. 7, March 2003.

Says quality-of-service standards need not be uniform across all customer categories or geographic areas. Instead, standards should be based on customers’ preferences and their willingness to pay for the costs of providing the specified level of quality.

### TRANSPORTATION

World Bank Cities on the Move: A World Bank Urban Transport Strategy Review China Financial and Economic Publishing House, Beijing, China, 2002.

Connects the urban and transport strategies with a focus on poverty. Concentrates on the problems of the very poor, not only in relation to income, but also in terms of the broader dimensions of social exclusion. Offers a better common understanding of urban transportation problems in developing and transitional economies and to identify an urban transport strategy framework for national and city governments.

World Bank, Sustainable Transport: Priorities for Policy Reform World Bank, Washington, D.C., 1996.

Describes how strategies and programs in the transport sector can be designed to make more efficient use of public resources, facilitate trade and other economic activity, foster competitive markets, and better serve users' needs--in particular, expanding poor people's access to services and opportunities.

### **Key Words**

Social policy, Distributional justice, Universal service, Subsidies, Cross-subsidy, Poor, Information disclosure, Monitoring, Sanctions

## **B. Environmental and safety issues**

- 1. Role of economic regulators in developing and overseeing environmental and safety issues, including effects of regulation on incentives for using renewable energy sources**
- 2. Developing standards related to health, safety, and environmental factors**
- 3. Models of interaction with agencies charged with concurrent oversight of health, safety, and environmental issues**

### **Core References**

Forsyth, P., "Environmental Externalities, Congestion and Quality under Regulation," in Infrastructure Regulation and Market Reform: Principles and Practice, edited by Margaret Arblaster and Mark Jamison. Canberra, Australia: ACCC and PURC, 1998, pp. 185-196.

Explains that one option for dealing with externalities is to allow full pass through of externality charges; however, the operator would have no incentive to reduce its creation of externalities. Another option is for the regulator to forecast the cost of controlling the externality and to adjust the price-cap accordingly. A third approach would be to allow partial pass through of the externality cost. In some cases, the regulator may be able to shift the externality charge on to the users, rather than to the operator, which would be appropriate if customer demand

is the primary driver of the externality, i.e., the operator cannot affect the amount of the externality nor its cost.

Kahn, Alfred. The Economics of Regulation: Principles and Institutions. Cambridge, MA: MIT Press, 1988, Reissue Edition, vol. I, Chapter 7.

Explains that externalities are generated to some degree in every economic transaction, and those transactions involving regulated firms are no different. Therefore, regulated firms and unregulated firms to behave in the same manner and whether the firm is regulated or unregulated the same review process should apply.

Kojima, Masami, “Leapfrogging Technology: Cost-Effective Solution for Pollution in Developing Countries?” Note no. 254 in Public Policy for the Private Sector, Washington, D.C.: World Bank Group, February 2003.

Explains that governments in developing countries should be cautious with technology-based environmental regulations – industrial-country practices may be costly because these countries have already “picked the low-hanging fruit,” that is, they have already taken low-cost-high-impact measures, such as providing water connections and controlling disease. Recommends that developing countries try to leapfrog to existing industrial-country practices may miss taking low-cost-high-impact steps. Also, developing countries may not have sufficient industrial infrastructure to maintain the more expensive technologies. Lastly, the combination of country risk and technology risk may make it too costly to invest in some newer technologies.

OECD, “Feasible Financing Strategies for Environmentally Related Infrastructure,” 2003.

Describes the application of a software tool FEASIBLE that matches environmental investment timetables with funding availability.

OFWAT, Ofwat Annual Report 2003-2004, 2004.

Describes collaborations with environmental regulators, use of environmental considerations in pricing, getting consumer input on environmental issues, environmental policy recommendations, effects of incentives on decisions that affect the environment, and monitoring environmental impacts.

Smith, Warrick, “Utility Regulators: Roles and Responsibilities.” Note no. 128 in Public Policy for the Private Sector. Washington, D.C.: World Bank Group, 1997.

Explains that utility regulators’ main focus is economic regulation to control market power. However, utilities are also subject to other regulation, including safety and environmental. Suggests that putting these different

regulations under one agency concentrates expertise and avoids coordination costs, duplication of effort, and greater complexity. However, keeping economic regulation separate from safety and environmental regulation may be required to avoid conflicts and problems of having sector-specific regulations and general regulations under a single agency.

## **Sectoral References**

### ELECTRICITY

Hunt, Sally, Making Competition Work in Electricity. New York: Wiley & Sons, 2002, Chapter 5.

Explains that under traditional regulation, the costs of complying with environmental regulations were passed along to consumers; however, in restructured competitive markets, there is no explicit mechanism like this and operators view these as any other costs. Explains that spot prices will normally include the marginal environmental costs of the marginal generator. Also, the three methods of environmental control include best available control technology, output limitation, and cap-and-trade. Suggests that the cap-and-trade mechanism is the preferred method since it prices clean air and the cost of the permits goes directly into the market price of electricity, rather than indirectly through temporary or permanent closures of generating plants. As for green power, suggests that the aim should be to make it easy for them to enter competitive markets whenever they are economic and, if they are to be subsidized, to subsidize in a way that does not impact the mechanisms that make the market competitive.

OFGEM, Transmission investment and renewable generation: Consultation document, October 2003.

Examines how transmission investment affects renewable generation. Considers wind power, generation in remote areas, cost recovery, the effects of price controls, business risk, and policy options.

### TRANSPORTATION

Assum, Terje, Road Safety in Africa: Appraisal of Road Safety Initiatives in Five African Countries Sub-Saharan Africa Transport Program Working Paper, number 33, World Bank, Washington, D.C., 1998.

Examines road safety in five African countries. There are a wide range of problems resulting in low safety levels and, even, in problems assessing what

those levels are. These range from low emphasis on the part of donors and, in many cases, local transport authorities, to corruption.

Babikci, Dzmitry and Stephan von Crammon-Traubadel *Regulating Public Automobile Transport: The Major Issues* Institute for Privatization and Management Research Center, Minsk, Belarus, 2005.

Examines public automobile transport in Belarus. As the structure of the sector changes with the development of private providers, the system of state regulation of public transportation needs to be reformed as well. The two major types of regulations needed are regulations on technical and safety standards, and market regulations. Paper focuses on the need for independent regulatory bodies to provide sound regulation for local transportation markets.

## WATER

OFWAT Updating the Overall Performance Assessment (OPA) – A Consultation. December 2003.

Examines alternative performance measures for water utilities, including environmental performance measures.

OFWAT, Linking service levels to prices, February 2002.

Examines policies for linking service levels to prices, including environmental issues.

### Key Words

Externalities, Tradable permits, Incentives, Penalties, Rewards, Monitoring, Environment

## C. Social aspects

[NOTE: Readers should cross-reference this section with Section A and with Chapter V Section C.]

### 1. **Regulatory strategies for promoting increased access and consumption affordability**

#### Core References

Baker, Bill and Sophie Trémolet, “Regulation of the Quality of Infrastructure Services in Developing Countries,” in Infrastructure for Poor People: Public Policy

for Private Provision, Penelope J. Brooke and Timothy C. Irwin, eds., Washington, D.C.: The World Bank, 2003, pp. 233-275.

Describes how regulation of service quality can sometimes preclude operators from using low-cost technologies that could make service affordable for the poor. Examines how to use differentiated quality and alternate suppliers for the poor.

Ehrhardt, David, “Impact of Market Structure on Service Options for the Poor,” in Infrastructure for Poor People: Public Policy for Private Provision, Penelope J. Brooke and Timothy C. Irwin, eds., Washington, D.C.: The World Bank, 2003, pp. 179-208.

Describes how mechanisms to ensure competitive markets improve service provision for the poor.

Estache, Antonio, Vivien Foster, and Quentin Wodon, Accounting for Poverty in Infrastructure Reform: Learning from Latin America’s Experience, Washington, D.C.: The World Bank, 2002.

Examines strategies for serving the poor. Explains macroeconomic and microeconomic linkages between infrastructure reform and the poor and discusses setting priorities. Describes reforms’ impacts on access and affordability for the poor. Describes approaches for improving access for the poor, including operator obligations, connection targets, low-cost technologies, subsidies and cross-subsidies, and open entry. Also describes approaches for improving affordability, including lifeline subsidies, means-tested subsidies, vouchers, balancing connection and usage charges, billing options, and prepaid service.

Komives, Kristin, Vivien Foster, Jonathan Halpren, and Quentin Wodon, Water, Electricity, and the Poor : Who Benefits from Utility Subsidies? Washington, D.C.: The World Bank, 2005.

Reviews how effective utility subsidies are in reaching the poor. Shows that while subsidies are widespread, their effectiveness in reaching and distributing resources to the poor is questionable.

Lovei, Laszlo, Eugene Gurenko, Michael Haney, Philip O’Keefe, and Maria Shkaratan, “Scorecard for Subsidies: How Utility Subsidies Perform in Transition Economies,” Note no. 218 in Public Policy for the Private Sector. Washington, D.C., October 2000.

Describes criteria for evaluating various subsidy schemes, including how well the poor are reached, the share of the subsidy that goes to the poor, the predictability of the benefit for the poor, the extent and

significance of unintended side effects, and administrative cost and difficulty. States that the main types of utility subsidies in Central and Eastern Europe and the former Soviet Union are analyzed using a scoring system developed by the authors. Instructions on how to apply the scoring system are provided.

OECD and The World Bank, Liberalization and Universal Access to Basic Services Telecommunications, Water and Sanitation, Financial Services, and Electricity. Washington, D.C.: The World Bank, 2007.

Provides a cross sectoral analysis of how infrastructure reforms affect universal access. Finds that efficiency improvements also improve access. Competition is more important than privatization in improving efficiency. Direct command mechanisms, such as direct financing and rollout requirements, and price controls provide poor results.

### **Sectoral References**

#### ELECTRICITY AND GAS

Jadresic, Alejandro, “Auctioning Subsidies for Rural Electrification in Chile.” Note no. 214 in Public Policy for the Private Sector. Washington, D.C.: World Bank Group, 2000.

Explains that in Chile, the central government allocates funds to regional governments on the basis of need and their past performance in meeting needs, while regional governments in turn allocate funds in a form of a one-time direct subsidy to private companies to help cover investment costs. Describes the allocation of these funds.

Powell, S., and M. Starks, “Does Reform of Energy Sector Networks Improve Access for the Poor?” Note no. 209 in Public Policy for the Private Sector. Washington, D.C.: World Bank Group, 1997, May 2000.

States that the fundamental cost characteristics of grid provision do not favor the provision of access to rural and poor populations, so grid-based electricity provision will not revolutionize access by the poor, but reductions in the fixed costs of transmission and distribution equipment, and innovations to reduce the costs of supplying remote areas, improve the prospects that grids will be extended to rural areas. However, the fixed costs of transmission and distribution equipment have not fallen enough to make it profitable to extend the grid to some rural populations. Concludes that extensions of the grid to these people must be subsidized.

Price, Catherine Waddams, “Better energy services, better energy sectors—and links with the poor,” in Energy Services for the World’s Poor, Washington, D.C.: The World Bank, 2000, pp. 26-32.

Examines direct and indirect effects of energy reforms on the poor. Considers effects of prices, quality improvements, access improvement, and environmental policies.

## TELECOMMUNICATIONS

GSM Association, “Universal Access: How Mobile can bring Communications to All,” London, U.K.: GSM Association, 2006.

Examines mobile development around the world. Concludes that governments should rely on market forces as the primary means to extend access and connections, that subsidies should play only a last resort role, and that universal access policies should be transparent and reviewed regularly.

ICT Regulation Toolkit. Washington, D.C.: infoDev and the International Telecommunications Union, 2007, Module 4.

Describes universal service and access mechanisms.

Stern, Peter A, and David N. Townsend, “New Models for Universal Access to Telecommunications Services in Latin America.” Washington, D.C.: World Bank Group, 2007.

Assesses universal access experiences in Latin America. Finds that telecoms has a significant economic impact, privatization and liberalization make significant improvements in sector performance, universal access programs and funds for community access to phones are quite successful, and subsidies for telecenters give mixed results. Makes policy recommendations.

Wellenius, Bjorn, “Extending Telecommunications beyond the Market.” Note no. 206 in Public Policy for the Private Sector. Washington, D.C.: World Bank Group, March 2000, pp. 1-12.

Explains that universal service support programs mainly seek to extend service to uneconomic areas and customers. Cost-effective measures to achieve widespread access focus on removing obstacles that prevent the market from working well, offering alternatives to standard service, and using market mechanisms to allocate responsibility for

extending service beyond the market and to quantify and allocate any necessary funding.

## TRANSPORTATION

World Bank Scoping Study – Urban Mobility in Three Cities: Addis Ababa, Dar es Salaam, and Nairobi Sub-Saharan Africa Transport Program Working Paper, number 70, World Bank, Washington, D.C., 2002.

Reports the results of a study of urban mobility in three Sub-Saharan African cities - Addis Ababa, Ethiopia; Nairobi, Kenya; and, Dar-es-Salaam, Tanzania. A major impediment is poor institutional structures and, consequently, a lack of leadership. Concludes that the only way to derive significant improvements in the performance of the urban transport sector, is to reorganize the way in which urban transport is planned, and developed.

CPCS Transcom, Urban Bus Toolkit: Tools and Options for Reforming Urban Bus Systems Public-Private Infrastructure Advisory Facility, World Bank.

Offers practical advice to enact fundamental system reforms.

## WATER

“Taking Account of the Poor in Water Sector Regulation,” World Bank: Water Supply and Sanitation Sector Board Working Note, Paper No. 11, August 2006.

Provides practical guidance on how regulatory frameworks can be designed and implemented in a way that is more conducive to expanding access and improving service to poor customers.

Foster, V., A. Gómez-Lobo, and J. Halpern, “Designing Direct Subsidies for the Poor – A Water and Sanitation Case Study.” Note no. 211 in Public Policy for the Private Sector. Washington, D.C.: World Bank Group, June 2000.

Explains that subsidies directed at public water companies have often benefited the middle class rather than the poor. States that the main advantages of direct subsidies to customers are that they are transparent and explicit, and minimize distortions in the behavior of water utilities and their customers. The main drawbacks are higher administrative costs and the difficulty of designing suitable eligibility criteria.

Komives, Kristin, and Penelope J. Brook Cowen, “Expanding Water and Sanitation Services to Low-Income Households.” Note no. 178 in Public Policy for the Private Sector, 1998.

Describes concession in La Paz and El Alto. Bidders identified the number of water connections they would make in exchange for a pre-specified tariff. Several service quality attributes were specified in the contract regarding water quality, continuity of service, water pressure and flow, and customer service. The contract also mandated that all new water and sewer connections must be in-house connections.

Rosenthal, Shane, “The Design of Manila Concessions and Implications for the Poor,” Washington, D.C.: The World Bank, 2002.

Examines the experience of Metro Manila's water and sanitation network. Concludes that the poor can benefit if the concessionaire has flexibility and alternative providers are allowed to serve markets where they have an advantage in doing so.

The World Bank, New Designs for Water and Sanitation Transactions Making Private Sector Participation Work for the Poor, Washington, D.C.: The World Bank (undated).

Considers policies that affect the poor, including tariff reform, governance, sector regulation, legal frameworks, competition, and private sector participation.

### **Key Words**

Costs, Social policy, Distributional justice, Subsidies, Universal service, Contracting out, Franchising

## **2. Development and funding of universal service obligations**

[NOTE: Readers should cross-reference this subsection with Chapter V Section E.]

### **Core References**

Chisari, Omar O., Antonio Estache, and Catherine Waddams Price, “Access by the Poor in Latin America’s Utility Reform Subsidies and Service Obligations,” Discussion Paper No. 2001/75, World Institute for Development Economics Research, United Nations University, Helsinki, September 2001.

Discusses access and affordability for the poor. Cheaper technologies and various financing/lending schemes can lower costs for serving the poor, which increases access and affordability. Examines Latin American experiences.

Irwin, Timothy, "Price Structures, Cross-Subsidies, and Competition in Infrastructure." Note no. 107 in Public Policy for the Private Sector. Washington, D.C.: World Bank Group, 1997.

Explains that the government can fund price subsidies from general tax revenue or simply rely on existing social safety nets rather than price subsidies. Criteria for evaluating this option include whether the costs are clear and measurable, whether administrative costs are as low as possible, whether the necessary revenue is raised at least possible cost, and how well the program is targeted toward those the government most wants to help.

### **Sectoral References**

#### ELECTRICITY AND GAS

Jadresic, Alejandro, "Auctioning Subsidies for Rural Electrification in Chile." Note no. 214 in Public Policy for the Private Sector. Washington, D.C.: World Bank Group, 2000.

Describes the Chilean system.

#### TELECOMMUNICATIONS

ICT Regulation Toolkit. Washington, D.C.: infoDev and the International Telecommunications Union, 2007, Module 4.

Describes approaches for funding universal service/access subsidies.

Wellenius, Bjorn, "Extending Telecommunications beyond the Market." Note no. 206 in Public Policy for the Private Sector. Washington, D.C.: World Bank Group, March 2000, pp. 1-12.

Evaluates approaches for funding universal service.

#### TRANSPORTATION

Starkey, Paul, Simon Ellis, John Hine, and Anna Ternell *Improving Rural Mobility: Options for Developing Motorized and Nonmotorized Transport in Rural Areas* World Bank, Washington, D.C., 2002.

Focuses on improving rural mobility by facilitating the provision of affordable means of transport and transport services. Concentrates on the many and varied types of transport that provide mobility such as bus service, freight trucks, bush taxis, transport animals, bicycles, and handcarts.

### **Key Words**

Costs, Subsidies, Universal service, Universal access, Competition

### **3. Connection and disconnection policies, alternative payment methods**

#### **Core References**

Lovei, Laszlo, Eugene Gurenko, Michael Haney, Philip O’Keefe, and Maria Shkaratan, “Scorecard for Subsidies: How Utility Subsidies Perform in Transition Economies,” Note no. 218 in Public Policy for the Private Sector. Washington, D.C., October 2000.

Explains that not disconnecting households who do not pay is one form of a utility service subsidy. States that this may seem to have no impact on a government’s budget, but in the long run it is costly for utilities, which strains the government’s budget by lowering corporate tax revenues and perhaps forcing the government to assume utility debt to prevent the utility from collapsing.

#### **Sectoral References**

WATER

Komives, Kristin, and Penelope J. Brook Cowen, “Expanding Water and Sanitation Services to Low-Income Households.” Note no. 178 in Public Policy for the Private Sector, Washington, D.C.: World Bank Group, 1998.

Describes features of La Paz and El Alto concession.

OFWAT, Dealing with Customers in Debt – Guidelines, October 2002.

Explains and describes policies for dealing with customer debt. Encourages operators to be proactive in seeking solutions, provide flexible payment policies, be non-threatening in customer interactions, consider customers' ability to pay, and not discriminate against customers who have debt problems.

OFWAT. Paying for Water Customer Research. Accent Research for WaterVoice and Ofwat September 2003.

Examines customers' attitudes towards paying their bills. Considers attitudes relative to paying for other services, customer priorities, reasons for water and sewerage debt, importance of water debt, size of debt, and motivations for resolving debt. Also examines what encourages customers to pay bills, including awareness of payment facilities, installment arrangements, billing frequency, prepayment schemes, payment of water charges with rent, trust funds, restart schemes, and customers' use of consumer assistance services. Also examines operator techniques for managing debt, including water companies' processes when customers fall behind in their payments, customer communication strategies, debt recovery strategies, and penalties. Lastly considers the water and sewage bill, including awareness of the supplier, the size of the bill, how bills are calculated, and cross subsidies.

### **Key Words**

Poor, Subsidies, Universal service, Universal access, Disconnection, Connection, Prices

#### **4. Options for pro-poor regulatory strategies, including impacts of competition and techniques for subsidizing the poor**

[NOTE: Readers should cross-reference this subsection with Chapter V Section E.]

### **Core References**

Barja1, Gover and Miguel Urquiola, "Capitalization, Regulation and the Poor: Access to Basic Services in Bolivia," Discussion Paper No. 2001/34, World Institute for Development Economics Research, United Nations University, Helsinki, July 2001.

Analyzes privatization in Bolivia. Considers how the capitalization mechanism attracted foreign investment for the poor in urban areas, but not appreciably in rural areas.

Chisari, Omar O., Antonio Estache, and Catherine Waddams Price, "Access by the Poor in Latin America's Utility Reform Subsidies and Service Obligations," Discussion Paper No. 2001/75, World Institute for Development Economics Research, United Nations University, Helsinki, September 2001.

Discusses access and affordability for the poor. Cheaper technologies and various financing/lending schemes can lower costs for serving the poor, which increases access and affordability. Examines Latin American experiences.

Estache, Antonio, Vivien Foster, and Quentin Wodon, Accounting for Poverty in Infrastructure Reform: Learning from Latin America's Experience, Washington, D.C.: The World Bank, 2002.

Examines strategies for serving the poor. Describes approaches for improving access for the poor, including operator obligations, connection targets, low-cost technologies, subsidies and cross-subsidies, and open entry. Also describes approaches for improving affordability, including lifeline subsidies, means-tested subsidies, vouchers, balancing connection and usage charges, billing options, and prepaid service.

Klein, Michael, "Ways Out of Poverty: Diffusing Best Practices and Creating Capabilities – Perspectives on Policies for Poverty Reduction." Policy Research Working Paper No. WPS2990. Washington, D.C.: World Bank Group, March 2003.

Explains that the key to poverty reduction is the creation of productive jobs and growth processes in poor areas. Examines importance of rules that respect property rights. Holds that firms are the vehicles that spread best practices and productive jobs to areas where poor people live. Explains importance of competition to ensure that new firms can enter the market, good firms face few barriers to growth, and substandard firms are allowed to fail. Further explains that in spreading best practices and more productive jobs, however, the lives of some people will be disrupted even while in the end raising living standards broadly. Identifies keys to dealing with politically popular programs that protect some groups and may undermine the workings of sound markets and the development of world-class capability in firms.

### **Sectoral References**

#### ELECTRICITY AND GAS

Barnes, Douglas F. and Jonathan Halpern, "The role of energy subsidies," in Energy Services for the World's Poor, Washington, D.C.: The World Bank, 2000, pp. 60-66.

Examines the role of subsidies in serving the poor. Considers motivation for subsidies, access subsidies, targeting, non-payment of bill, excessive subsidies and technology choices. Reviews policies for deciding who and what to subsidize, where, when, and by how much. Also reviews institutional processes for subsidies.

Foster, Vivien, “Measuring the Impact of Energy Reform – Practical Options.” Note no. 210 in Public Policy for the Private Sector. Washington, D.C.: World Bank Group, May 2000.

Explains that to improve the accuracy in reaching the target population, policymakers should examine the poverty profile of water utility customers and collect evidence on willingness to pay in relation to the true costs of service provision. Argues that full-scale subsidies should be avoided, since they eliminate incentives for the efficient use of water. Furthermore, the subsidy should be capped at some pre-determined subsistence consumption level, to not encourage excessive use of the service. Eligibility for subsidies should not be reassessed too frequently.

Powell, Stephen and Mary Starks, “Key drivers of improved access—service through networks,” in Energy Services for the World’s Poor, Washington, D.C.: The World Bank, 2000, pp. 44-50.

States that the fundamental cost characteristics of grid provision do not favor the provision of access to rural and poor populations, so grid-based electricity provision will not revolutionize access by the poor, but reductions in the fixed costs of transmission and distribution equipment, and innovations to reduce the costs of supplying remote areas, improve the prospects that grids will be extended to rural areas. However, the fixed costs of transmission and distribution equipment have not fallen enough to make it profitable to extend the grid to some rural populations. Concludes that extensions of the grid to these people must be subsidized.

Villagran, Eduardo, “Key drivers of improved access—off-grid service,” in Energy Services for the World’s Poor, Washington, D.C.: The World Bank, 2000, pp. 52-59.

Examines off-grid solutions for service to the poor. Considers fuel reliability, cost of doing business, customer information, financing, technological and commercial innovations, and the role of government.

#### TELECOMMUNICATIONS

ICT Regulation Toolkit. Washington, D.C.: infoDev and the International Telecommunications Union, 2007, Module 4.

Describes universal service/access options and how regulators implement them.

## TRANSPORTATION

World Bank Cities on the Move: A World Bank Urban Transport Strategy Review China Financial and Economic Publishing House, Beijing, China, 2002.

Connects the urban and transport strategies with a focus on poverty. It concentrates on the problems of the very poor, not only in relation to income, but also in terms of the broader dimensions of social exclusion. Offer a common understanding of urban transportation problems in developing and transitional economies and to identify an urban transport strategy framework for national and city governments.

World Bank, Sustainable Transport: Priorities for Policy Reform World Bank, Washington, D.C., 1996.

Describes how strategies and programs in the transport sector can be designed to make more efficient use of public resources, facilitate trade and other economic activity, foster competitive markets, and better serve users' needs--in particular, expanding poor people's access to services and opportunities. Discussion is organized around the concepts of economic and financial sustainability, environmental and ecological sustainability, and social sustainability.

## WATER

Foster, V., A. Gómez-Lobo, and J. Halpern, "Designing Direct Subsidies for the Poor – A Water and Sanitation Case Study," Note No. 211 in Public Policy for the Private Sector. Washington, D.C.: World Bank Group, June 2000.

Considers direct subsidies for the poor. Examines the Chilean experience where the government paid a portion of the customer bill.

Galiani, Sebastian, Paul Gertler, Ernesto Schargrotsky, "Water for Life: The Impact of the Privatization of Water Services." Center for Research on Economic Development and Policy Reform Working Paper 154, Stanford University, CA, August 2002.

Considers impact of privatization on water services for the poor in Argentina. Finds that impacts have been positive. Further found that poor benefited the most from in terms of reductions in child mortality.

Komives, Kristin, and Penelope J. Brook Cowen, “Expanding Water and Sanitation Services to Low-Income Households.” Note no. 178 in Public Policy for the Private Sector, Washington, D.C.: World Bank Group, 1998.

Describes features of La Paz and El Alto concession.

The World Bank, New Designs for Water and Sanitation Transactions Making Private Sector Participation Work for the Poor, Washington, D.C.: The World Bank (undated).

Discusses the importance of considering the poor in water reforms. Examines various elements of water reforms, including tariff reform, governance, and management changes. Discusses legal issues for helping the poor, including the regulatory framework, using competition, private sector involvement, and methods for addressing legal issues.

### **Other References**

Clarke, George R. G., and Scott J. Wallsten, “Universal Service: Empirical Evidence on the Provision of Infrastructure Services to Rural and Poor Urban Customers,” in Infrastructure for Poor People: Public Policy for Private Provision, Penelope J. Brooke and Timothy C. Irwin, eds., Washington, D.C.: The World Bank, 2003, pp. 21-75.

Examines subsidies in infrastructure services. Finds little evidence that these subsidies benefit the poor.

### **Key Words**

Market reform, Poor, Social policy, Distributional justice, Subsidies, Universal service, Universal access

## **5. Models of operator obligations for serving the poor**

### **Core References**

Chisari, Omar O., Antonio Estache, and Catherine Waddams Price, “Access by the Poor in Latin America’s Utility Reform Subsidies and Service Obligations,” Discussion Paper No. 2001/75, World Institute for Development Economics Research, United Nations University, Helsinki, September 2001.

Discusses access and affordability for the poor. Cheaper technologies and various financing/lending schemes can lower costs for serving the poor, which increases access and affordability. Examines Latin American experiences.

Econ One Research, Inc. and EMCON Consulting Group, “Northern Electricity Distribution Service in Northern Namibia: A Case Study in the Private Provision of Rural Infrastructure,” July 31, 2002.

Examines rural electricity in Namibia. Draws lessons concerning policy preparation, government coordination, timeliness, private sector participation, customer relations, government interference with private operators, and political interference in the process.

Econ One Research, Inc. and ESG International, “Uganda Telecommunications: A Case Study in the Private Provision of Rural Infrastructure,” July 30, 2002.

Examines rural telecommunications development in Uganda. Draws lessons concerning privatization, competition, application of both commercial interests, subsidies, differences between rural and urban customers, regulation of prices, and regulatory skills.

**Key Words**

Market reform, Poor, Social policy, Distributional justice, Subsidies, Universal service, Universal access