

## **The Regulation of Public Utilities of the Future in Latin America and the Caribbean**

### **RG-K1198**

#### **1. Background and Justification**

The regulation of public utilities has been evolving across the world, and Latin America and the Caribbean (LAC) is no exception. Privatization has often transformed public enterprises to private firms with monopoly power, and many lessons have been learned in regard to regulating such entities over the years. Those privatizations, though, have also included some forms of deregulation and liberalization in different segments of the markets involved. Increased opportunities for competition have been introduced in several instances, and technology has already been an important driver of change.

Regulation necessarily requires trade-offs reflecting multiple objectives. Static allocative efficiency, universal access / distributive concerns and stimulating adequate investment have been common goals—and ones that frequently create tension in regulatory design. More recently, environmental issues and accommodation to likely disruptive technological changes have become further pressing concerns.

These trends are visible in several sectors. In energy, the trade-off between allocative efficiency and equity has long produced tension in setting tariffs, whereas ensuring adequate incentives for investment and future capacity has been a constant underlying concern. More recently, environmental goals have become key, and technology has dramatically brought down the cost of renewables. More radical changes may well be underway with the increasing possibility of household and small business generation driving network decentralization. In transport, electric and autonomous vehicles may revolutionize current habits and allow environmental goals to become more attainable as the technology advances and becomes accessible to wider populations, particularly in Latin America's large urban centers. In water, desalination technologies, either centralized at scale or more local, decentralized and specific to industry or agriculture, may dramatically change the economic structure of the sector.

These structural changes are likely to lead to a paradigm shift with fundamental implications for public policy. The public infrastructure service companies of today will likely face radical changes. Technological change may bring decentralization, greater competition, foster tighter links between sectors (e.g., electric vehicles suggest that the

## The Regulation of Public Utilities of the Future in Latin America and the Caribbean

---

future of energy and transport will be closely intertwined) and will bring new challenges for public policy, including regulation.

Some believe we are on the cusp of monumental changes akin to the invention of the internal combustion engine—or perhaps even more fundamental in nature. In this context, while a good diagnosis of the current challenges is useful, it is also important to think ahead. How can regulation today allow for the gains such changes may bring in an orderly fashion as well as adapt to what is required going forward? What institutions will we need for the future regulation of utilities? What will be the right institutional, policy and instrument designs for the regulation of infrastructure services of the future?

In this network project we seek to advance knowledge in these areas for Latin America and the Caribbean. Like other network projects, this one will be an exercise in joint learning with several teams working across different countries and sectors and with the opportunity to share common methods and exchange information on experiences and ideas. The results of the project will be a series of papers that will serve as inputs to the 2020 IDB flagship publication *Development in the Americas*, which will be dedicated to infrastructure services. The teams will also have the opportunity to have their own individual papers published by the IDB and, depending on the outputs produced, we hope that there will be space for a separate publication such as a journal special issue, a separate book or other publication opportunities.

### 2. Objective

This network project has several related objectives. The first is to map the current regulatory institutions, policies and instruments in a set of countries and sectors. This information, which will be standardized across teams as far as possible, will then form a database (largely qualitative in nature) regarding the current state of regulation across specified countries/sectors in LAC.

Second, this knowledge base will then be used to gain a good understanding of the challenges being faced. Challenges may relate to how far current regulatory design is from achieving the competing goals of regulation, such as those outlined above (efficiency, equity, investment, environmental and technological adaptation). Additional challenges may also include how current regulatory structures can allow competition to flourish as well as challenges of a more institutional or political character.

Third, the idea is to consider specifically current and future challenges arising from potentially disruptive technological change. Comprehending and analyzing these challenges will require a perspective on how specific technologies will advance and impact the market and its economic structure. Of particular interest would be ambitious

## The Regulation of Public Utilities of the Future in Latin America and the Caribbean

---

attempts to delineate scenarios where technological advances fundamentally alter current economic structures.

A final objective is to provide policy recommendations. One issue is to determine what policies should be pursued today in order to allow for beneficial technological changes as well as further the various objectives relevant to the transition to anticipated new economic structures. Another concern is to envision what regulatory institutions, policies and instruments will be needed for the future.

### 3. Scope, Methodology and Data

**Scope:** Each study is likely to focus on one country and on one or more related sectors. The sectors we wish to cover in the project as a whole are energy, transport and/or water and sanitation. Each team may propose to analyze one sector or more than one, especially where there is a close relation between them. Other sectors may be proposed with suitable justification. Broadband or other internet network services, for example, may be of interest, but we do not anticipate sponsoring work on telecoms. In exceptional cases, teams may wish to consider one or more related sectors across countries. This might be appropriate for considering smaller countries in Central America and/or the Caribbean and/or where there are significant cross-country interactions in the sectors under consideration. As discussed above, for every country/sector chosen, each study should consider current challenges as well as likely developments in the coming years and the longer term, assuming that significant technological changes have taken place.

**Methodology:** While we have some thoughts as to appropriate methodological approaches (see box below) we are particularly interested in innovative and novel approaches. These include methodologies to: a) assess current regulatory policies according to how they provide incentives for meeting various competing objectives today (efficiency, equity, investment, environmental goals); b) assess how current regulations allow or hinder the introduction of beneficial technology; c) assess how technological advances may change economic structures in the future; and d) assess how regulations of the future may need to be structured given these changes and assumed objectives. While descriptive accounts backed by data are very useful, we are particularly interested in proposals containing ideas regarding an analytical treatment of at least some of these issues. Of particular interest would be proposals on how to evaluate regulations in the light of competing objectives and given some technological change. For example, while under existing technologies the regulation of a natural monopoly may be justified as a means to reach an acceptable (or optimal) trade-off between objectives, this may become unfeasible or dominated as new technology implies changing economic

## The Regulation of Public Utilities of the Future in Latin America and the Caribbean

---

structures. Under new technologies, greater decentralization and/or competition may imply an alternative regulatory design that would yield superior results in the longer run.

**Data:** Each team will be expected to assemble a dataset on the country (or countries) and sector(s) chosen. This dataset may include basic information regarding the sector(s) and information regarding the current regulatory structure(s). It may also include information on the technological changes that have taken place and assumptions on how forthcoming technological advances may progress.

We are looking for research teams who will detail the current institutional and regulatory design and challenges in a selected sector or sectors. The teams should be knowledgeable in the sector(s) chosen and should be able to make realistic assumptions as to how the sector(s) may change in the future and how current regulatory structures may allow or hinder such developments. Reference to developments in other countries or regions in the world that are at the leading edge of the chosen sector(s) may be useful in this regard.

The teams will also be required to consider what the regulation of the future may look like given potentially deep structural changes in the sectors chosen. This design will no doubt have to bear in mind the multiple objectives alluded to above, including allocative efficiency, equity, adequate investment, environmental and climate change objectives and allowing beneficial technological change. Beyond these basic elements, the teams may wish to suggest additional specific analyses that are relevant to the countries or sectors chosen. Teams may also wish to analyze the complementarity between sectors or the technological advances in the chosen sector(s) and other challenges facing the country, such as equity, environmental or climate change goals.

## The Regulation of Public Utilities of the Future in Latin America and the Caribbean

### ***Box. An example of a possible methodological approach***

The fundamental stylized principles of optimal regulation, whether of the present or the future, could be seen in the following terms. First, assume that optimal regulation is defined generically as the intervention required to correct “market failures,” using direct tools that try to mimic incentives that characterize competitive markets (which deliver static and dynamic efficiency); using potential and effective competition as complementary tools; and dealing with social and environmental demands in the least distortive way (i.e., taking into account the effects caused by policy interventions on price signals). Departures from optimal regulation entail social costs that are proportional to the alternatives sacrificed. For example, if there is no potential competition in a given segment of the regulated industry, the lack of pricing regulation (i.e., prices and tariffs) that reflect the true costs of provision of services may entail some *allocative* inefficiency (the quantities of services supplied and demanded may not exhaust gains from trade). That would not entail a real sacrifice of *productive* efficiency, however, because—even with cost-reflective prices—there would be no competition to discipline the monopolist. Taking a case from the electricity sector, the absence of wholesale price signals reflecting the true generation cost incurred within, for example, five-minute frequencies, would not entail a relevant inefficiency if users do not have smart meters to capture those varying costs, or if they cannot sufficiently accommodate their demands to those price signals.

Thus, current regulation allowing only partial competition in predetermined segments of public infrastructure services (e.g., electricity generation); or administering other inefficient interventions regarding the structure of prices and tariffs (both cross-subsidies in the transportation and distribution—T&D—network and the lack of high-frequency flexible prices signaling true scarcity—i.e., rigidities) and/or the correction of externalities and/or the handling of social demands to assist poor users, could have only a limited impact. This limited impact stems from a lack of potential competition, which means that sub-optimal regulation does not actually prevent significant potential gains from any relevant competitors. Moreover, rigid prices that do not signal real-time scarcity do not really miss the opportunity to induce demand responses. Therefore, while regulatory regimes might have been to this date somewhat distant from the optimal design in terms of mimicking competitive markets, sub-optimal regulation might have been relatively costless in relation to a counterfactual where competition or technological adoption was not feasible.

In the future, however, effective competition might be feasible and relevant in segments and dimensions of the regulated services where it was previously not thought to be possible. Examples include competition to conventional energy generators from decentralized users supplying distributed energy to the distribution network and competition to distribution companies from retail suppliers inducing final consumers to minimize the use of the distribution network through decentralized investment in small non-conventional generators and storage devices. Then, cross-subsidies and inefficiencies in the current pricing of energy and T&D would entail sacrificing the new competition that would otherwise be feasible. In such cases, a challenge for regulation of the future would be how to avoid the higher costs caused by not adopting optimal regulation. The cost effectiveness of the proposed regulatory reforms can then be benchmarked against the estimated costs of not doing anything.

## The Regulation of Public Utilities of the Future in Latin America and the Caribbean

---

### 4. Possible Outline of the Studies

1. Brief review of the sector(s) chosen to be studied and the regulation thereof (i.e., institutions, policies and instruments).
2. How is regulation adapting to the disruptive forces of climate change, increasing demand for distributional equity, and technological changes in the selected sector(s)?
3. How should regulation (institutions, policies and instruments) adapt in the years ahead in the face of the three disruptive forces mentioned above?
4. What is the appropriate regulatory framework to reap the full benefits of ongoing technological changes in the sector(s)? What changes are required? What is the sequence of those changes? Can we learn from experiences in other regions?

Be ambitious. We would welcome efforts to direct the analysis to the understanding of the implications that disruptive technologies have on the overall organization of infrastructure services and their optimal regulation. For this purpose, we envisage that an analytical approach should understand and separate two different types of technological/organizational disruptions. The first type are those that have a clear impact on the working of wholesale upstream markets, such as the introduction of nonconventional renewables in electricity markets, the development of new technologies for urban mobility (both public and private transport) or the emergence of new technologies for bulk water production or sewage treatment. A second type of disruption, and more fundamental for infrastructure, is the introduction of technologies that decentralize production, make the efficient working of the infrastructure network more important than before, and enlarge competition through outside opportunities (and eventual grid defection) by some customers. Technology disruption is expected to make infrastructure sectors more interdependent (e.g., the electrification of transportation). Teams are expected to consider how this increasing interdependency should be reflected in the regulatory landscape, through possible changes in the institutional architecture.

5. Does allowing for more competition in the sector(s) mean that less reliance on regulation would be required?

## The Regulation of Public Utilities of the Future in Latin America and the Caribbean

---

### 5. Content of the Research Proposals

To participate in the project, research institutions must submit a proposal detailing the following:

- Each team should select one or more sectors in one or more countries which will be the focus of their study. Priority may be given to teams that consider more than one sector and where those sectors may be related (e.g., energy and transport).
- Relevance of the case: what are some specific insights that the case will bring to the overall project? Why should we include the case in the study? What particular features of the regulatory game will be highlighted by the case study? In other words, why is the case of interest for this project?
- Brief discussion of the main actors and institutions, and the workings of the regulatory process in the case proposed.
- Each team should state what technological advances they will be considering (for example, the widespread adoption of autonomous electric vehicles).
- Each team should review the current relevant regulatory frameworks pertinent to the sector(s) chosen and detail the challenges in the short and longer term.
- Considering the shorter term (i.e., the next few years), the teams may wish to consider how the transition should be managed and more specifically discuss how regulation may need to be adapted to provide appropriate incentives for the technology to be adopted while at the same time providing for a stable transition period.
- Considering the longer term (i.e., ten years or more), the teams should assume that the technology chosen for the analysis is adopted in a widespread fashion and discuss the implications for the regulation of the sector(s).
- The teams should also consider how climate change goals and universal access / distributive objectives should be included in the transition and longer-term regulatory structures.
- Teams may wish to specifically address how the new technology considered will change competition in the sector(s) and how regulation may then need to adapt especially as a response to more competitive structures that technological advances may promote.
- List of proposed interviews, as well as a statement regarding the degree of access to the main interviewees.
- Potential relevance of the lessons and conclusions to be extracted for the regulatory policy debate in the country.

## The Regulation of Public Utilities of the Future in Latin America and the Caribbean

---

In addition, proposals must include:

- The name of the research leader and a list of the researchers who will be involved in the project. The center should justify the choice of the research team, highlighting their capacity to meet the objectives of the project, including relevant prior experience. Curricula vitae of the researchers may appear in a separate annex. Subsequent substitutions for researchers originally specified in the proposal may be made with prior approval from the IDB Network coordinator, but the project leader should lead the entire project to completion.
- A budget (in a separate annex) indicating the time and resources that will be used within the context of the research work plan. The budget proposed by the research center should disaggregate items financed by the IDB contribution and those financed by the research center. The budget should distinguish between amounts assigned to professional honoraria, data collection, overhead and other major categories of research expenditures. The proposal and corresponding budget must be sent in separate files.
- Institutions need to provide the name and contact information of their legal representative, with authority to sign contracts with the IDB, if selected to conduct the study.
- An indicative proposal for the diffusion strategy of the final version of the paper and its policy implications.

**Note: Proposals must be submitted in English.**

### 6. Selection Criteria

**Only research institutions** (including think tanks) may present proposals. Research teams will be selected according to three main factors:

- i) **Relevance.** Research teams must spell out in detail the relevance of the country case and the episodes chosen to meet overall project objectives stated above, and how they will contribute to the understanding of the challenges and opportunities to adapt current regulation to the regulation required by future technological-environmental-social demands.
- ii) **Data and Methodology.** The proposals should explain in as much detail as possible how they will approach the subject under study. Data collection issues should be spelled out in detail (what sources of data will be used, what interviews the team plans to conduct, the chances of success in obtaining such data/interviews, the channels they are planning to use to obtain data, etc.).

## The Regulation of Public Utilities of the Future in Latin America and the Caribbean

---

- iii) Team Experience. The relevance of the team's experience for the proposed project will be a very important criterion in the selection process. Previous experience in economic regulation of public utilities, or research showcasing the team's ability to clearly describe policymaking processes using qualitative sources of information, would be a plus.

### 7. Proposal Submission

Interested research institutions should submit a proposal no later than **July 23, 2018** using the web submission form that is provided in the Call for Proposals announcement. If you are unable to submit the form electronically, please send an e-mail to [red@iadb.org](mailto:red@iadb.org).

Proposing research institutions should be registered as Research Network members (contact Elton Mancilla at [red@iadb.org](mailto:red@iadb.org)) and should be based in the Latin American and Caribbean region. US and European institutions do not qualify as members of the Research Network. However, researchers from the United States and Europe can participate in research teams from proposing institutions.

### 8. Coordination and Schedule

The project will be administered by the Research Department (IDB/RES), under the technical coordination of Eduardo Cavallo (IDB/RES), Andrew Powell (IDB/RES) and Tomás Serebrisky (IDB/INE), and external advisors Fernando Navajas and Santiago Urbiztondo (FIEL, Argentina).

The tentative schedule of activities is as follows:

- **July 23, 2018:** Due date for **proposal submissions**. Institutions should make sure to submit complete documentation to the evaluation committee. Complete documentation includes: registration form with all requested information, the research proposal, budget, and curricula vitae (CVs up to three pages long).
- **July 31, 2018:** Announcement of **selected research proposals**.
- **September 5 and 6, 2018:** **First Discussion Seminar** in Washington, D.C., with the technical directors of the projects and the coordinating committee for the purposes of discussing methodological issues, as well as presenting a preliminary analysis of some of the main issues to be explored in each study.
- **September 21, 2018:** Due date for receiving an **annotated outline** of the research paper, incorporating the changes associated with the comments received in the discussion seminar.
- **December 15, 2018:** Due date for receiving a **first draft** of the research paper.

## The Regulation of Public Utilities of the Future in Latin America and the Caribbean

---

- **January 18, 2019: Second Discussion Seminar** in Washington, D.C. with the technical directors of the projects and the coordinating committee to discuss the first draft of the research papers.
- **March 11, 2019:** Deadline for a **final version** of the research papers, including a summary that discusses policy lessons. Data should be submitted by this date. Deadline for presenting a list of the most relevant dissemination activities (e.g., events, seminars, workshops, etc.) to discuss the main policy lessons of the country study with local authorities. Research papers must follow the **IDB Manual of Style for working papers**.

Studies that are of good quality will be considered for publication in the IDB working paper series.

A selection of the best papers may be included in a special issue of an academic journal or in an edited volume on The Regulation of Public Utilities of the Future in Latin America.

### 9. Financial Contribution and Payment Schedule

The IDB will contribute up to **US\$30,000** (or domestic currency equivalent) to the total budget of each study, depending on the scope of work proposed. The payment schedule is as follows:

- 20 percent within 30 days of signing the formal agreement between the IDB and the respective research center.
- 10 percent within 30 days of presenting and approval by the IDB of the annotated outline following the first seminar.
- 35 percent within 30 days of presenting and approval by the IDB of the first draft of the research paper.
- 35 percent within 30 days of presenting and approval by the IDB of the final research paper and upon delivery of the datasets utilized by the study to the IDB.

## The Regulation of Public Utilities of the Future in Latin America and the Caribbean

---

### 10. References

- Bouton S., E. Hannon, S. Knupfer, and S. Ramkumar (2017) "The future(s) of mobility: How cities can benefit", McKinsey, <https://www.mckinsey.com/business-functions/sustainability-and-resource-productivity/our-insights/the-futures-of-mobility-how-cities-can-benefit>
- Cross-Call D., R. Gold, L. Guccione, M. Henchen, and V. Lacy (2018), "Reimagining the Utility: Evolving the Functions and Business Model of Utilities to Achieve a Low-Carbon Grid". Rocky Mountain Institute, January 2018. [www.rmi.org/reimagining\\_the\\_utility](http://www.rmi.org/reimagining_the_utility)
- Corneli S. and S. Kihm (2015), "Electric Industry Structure and Regulatory Responses in a High Distributed Energy Resources Future", Report N°1, Berkeley Lab, November, [https://emp.lbl.gov/sites/all/files/lbnl-1003823\\_0.pdf](https://emp.lbl.gov/sites/all/files/lbnl-1003823_0.pdf)
- von Hirschhausen C. (2017) "Prosumage and the future regulation of utilities: An introduction", *Economics of Energy and Environmental Policy*, 6, pp.1-5.
- Jones, L.E. and G. Olsson: "Solar Photovoltaic and Wind Energy Providing Water", Wiley Online Library, July 2017, available at: <https://onlinelibrary.wiley.com/doi/full/10.1002/gch2.201600022>
- MIT (2016), *The Utility of the Future: An MIT Energy Initiative response to an industry in transition*, Boston Mass: MIT.
- Pérez-Arriaga I., J.D. Jenkins and C. Batlle (2017), "A regulatory framework for an evolving electricity sector: Highlights of the MIT utility of the future study", *Economics of Energy and Environmental Policy*, 6, pp.71-92.
- Wolak, F. (2017): "Efficient Pricing: The Key to Unlocking Radical Innovation in the Electricity Sector", OECD Working Party No.2 on Competition and Regulation.