"Regulation and Electrification Four Principles And A Model Law"*

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“Can you recommend a regulatory system that will ‘help’ rather than ‘hurt’ my government’s electrification programs?”

African regulator 2005

Outline

1 – Electrification Models (Offgrid and Grid)

2 – Two Golden Rules of Regulation

3 – Four Regulatory Principles for Electrification

4 – Elements of a Model Electricity Law

"a first installment…."

Electricity Access in Developing Countries, 2002

Country or region	Population without Electricity (million)	% Population with Electricity	% Urban Population with Electricity	% Rural Population with Electricity
South Asia	814	40	69	33
Sub-Saharan Africa	531	17	52	8
North Africa & ME	39	87	99	88
East Asia	216	88	96	83
Latin America	47	88	98	61
Developing Countries	**1,620**	**70**	**85**	**72**

Sources: World Bank, 2000, IEA 2002.

Form of Ownership		Technologies			
		grid extension	connected village minigrid	isolated village minigrid	single user system
		Grid ←			→ **Offgrid**
	small, decentral	Small grid reseller (India)	Hydro minigrids selling to local customers and to the main grid (China, Nicaragua) Formerly isolated minigrid now connected to grid, (Cambodia)	Diesel or hydro minigrid (Cambodia, Ethiopia)	SHS (Honduras, Kenya, Indonesia, Sri Lanka) PV/wind/diesel water pumping (Brazil, Chile, Mexico) WHS or pico hydro (Argentina, Mongolia, Nepal)
	private (for profit)	Privatized concessionaire extends/fills grid (Argentina, Chile, Guatemala, Uganda, …)		Offgrid concession (Argentina)	
	large, central		Technology neutral electrification concession (Senegal)		SHS (Bangladesh, Bolivia, Morocco, South Africa)
	cooperative	Cooperative finances grid extension (Costa Rica, Bangladesh, US)		Multi-service Coop with diesel or hydro microgrid (Bangladesh, Bolivia, Philippines)	Agricultural Coop using diesel genset (Bolivia)
	non governmental	Small “community gateways” (Bolivia)		Community microgrids (Brazil, Cambodia, Honduras, Indonesia, Nicaragua, Sri Lanka)	Diesel genset or renewable energy to power a school, clinic, community center,(Argentina). PV Battery Charging Stations (Nicaragua)
	other community organizations				
	small, decentral	Small state-owned utility extends/fills grid (Colombia, Brazil)		Municipal diesel or hydro minigrid (Bolivia)	
	public (state owned)	State utility extends/fills grid and sells at retail (Botswana, Mozambique, Thailand, Tunisia)		Residual state-owned isolated diesel-minigrids with fuel subsidies (Nicaragua, Cambodia)	SHS (Mexico)
	large, entral				

Two “golden rules” of regulation

Rule 1 - Regulation is a means to an end

What ultimately matters are outcomes (sustainable electrification) not regulatory rules.

“Performance, not process.”

Rule 2 - The benefits of regulation must exceed the costs

The economics of offgrid electrification are fragile.

Villager -- “The most expensive electricity is no electricity.”

Why regulate off-grid electrification in a different way?

➔ **Low demand density:**
- typical demand about 50kWh/month
- affordability and liquidity issues
- many users are remote and/or dispersed

➔ **Therefore:**
- revenues are low
- costs are high
- low-return, high-risk markets

➔ Often SME suppliers with specific problems (financial and technical capacity)

➔ Monitoring remote and/or small systems is difficult.

➔ Other government entities (e.g., Rural Electrification funds) are often *de facto* regulators (at least, initially).

Principle #1 Adopt light handed and simplified regulation - especially for offgrid electrification

➔ Minimize

- Number of regulatory requirements/decisions
- Number of government entities making separate (coordinated?) decisions
- Amount of information required for the entities performing electrification

Too Much Unnecessary Regulation is Not Good for a Country

"It takes two days to start a business in Australia, but 203 days in Haiti and 215 days in the Democratic Republic of Congo"

- Doing Business 2004, Pg. xxxi

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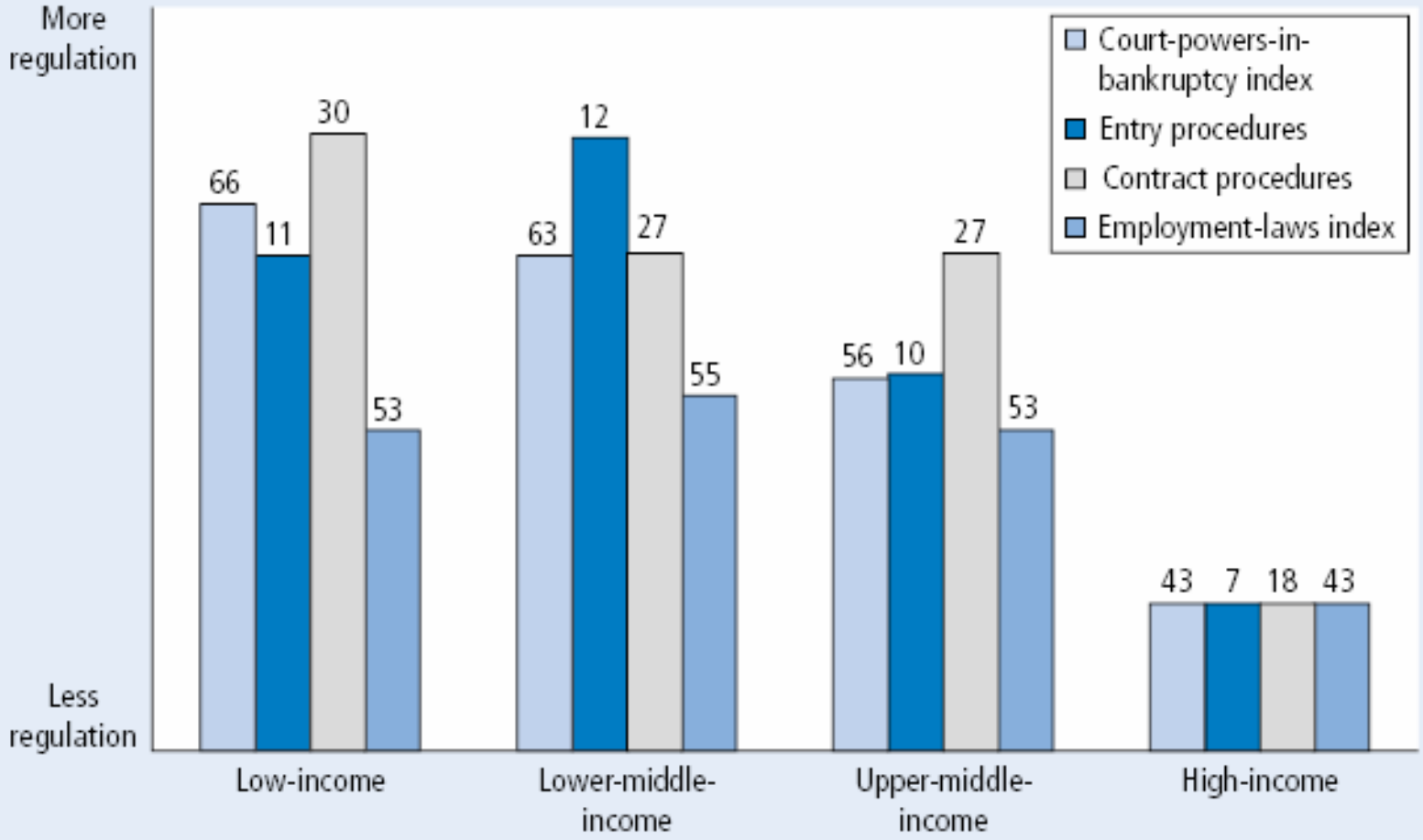
Poor Countries Regulate Business the Most



Note: The indicators for high-income countries are used as benchmarks. The average value of the indicator is shown above each column.

Source: World Bank, Doing Business in 2004, pg. xiii

Principle #1 Light handed regulation …continued …

- Do I really need this information?
- What will I do with it?
- Can the number of review and approval steps be reduced?
- Can I delegate regulatory tasks to other entities?

Principle #1 Light handed regulation …continued …

Examples (Reality)…

➔ **"Heavy Handed" Regulation**

- **Bolivia 2002:** Rural mini-grid survey – (i) many small operators not registered (reporting requirements too costly, capacity lacking) (ii) coops cannot be concessionaires

  Interim Solutions- "contrato de adecuacion" and raise filing threshhold

- **Philippines 2004:** Requiring individual cost of service filings for more than 100 rural electricity cooperatives.

Principle #1 Light handed regulation …continued …

➔ "**Light Handed" Regulation:**

- **Cambodia 2006:** Tariff tables for several hundred mini-grid operators (proposed) (Similar for Peru)
- **Nicaragua 2004:** New mini-grids regulated by contract and law -> streamline reporting requirements and formal steps

➔ **"Non Existent" Regulation:**

- **Cambodia 2003 (mini-generators):** *de facto* deregulation (Fiona Woolf)
- **Bolivia 2002 (mini-generators):** *de facto* deregulation (Enrique Birhuett)

Don't make "smallness" an end in itself. Create incentives for consolidation and "regularization."

Principle #2 The national or regional regulator should be allowed (required?) to "contract out" or delegate, either temporarily or permanently, regulatory tasks to other government or non-government entities.

Reality:

The rural electrification agency or rural electrification fund are inevitably *de facto* regulators

Why:

- A de facto regulator because of the conditions/requirements imposed on the operator to receive subsidies (e.g. service level).
- Often more knowledgeable than the regulator about the operations of electrification providers (especially offgrid).
- Better appreciation of the cost implications of imposing regulatory requirements.
- Coordination between different government entities is slow and tends to produce conflicts.

Recommendation:

Make the *de facto* regulator the *de jure* regulator (at least for off grid electrification)

Principle #2 Delegate regulatory tasks to other entities …continued …

Examples:

- **Bangladesh Rural Electrification Board** – "Regulation by the banker"
- **Cambodia** – *De facto* delegation to a village electricity committee. Model documents are very important.
- **Bolivia** – Self-reporting plus random audits for SHS (Vice Ministry for Electrification, Alternative Energies and Telecommunication)

How can delegation be implemented?

Types of delegation

1. **Full and Permanent Delegation**
   - Rural electrification agency decides on tariff and concession terms.
   - No further formal review by the electricity regulator.

2. **Partial and Conditional Delegation**
   - National/provincial regulator designates the rural electrification agency as its agent.
   - Rural electrification agency makes recommendations to the regulator.
   - Regulator decides on a “no objection” basis.
   - Regulator has “call-back” rights.

Principle #3 The regulator should be allowed to vary the nature of its regulation depending on the entity that is being regulated.

→ **Realities of isolated hydro mini-grids**

Private owner → incentives is for high prices

Vs.

Cooperative → incentives is for low prices

→ **Good Example: Sri Lanka** (Successful self-regulation)

- Govt. sets technical specifications and safety standards
- Coop sets prices / membership fees

→ **Bad Example: Philippines:** (Unsuccessful self-regulation)

→Prices too low

→Overstaffed

If there is self-regulation, regulator needs "step-in" rights

Principle #3 The regulator should be allowed to vary the nature of its regulation depending on the entity that is being regulated.

→ **Recommendation:**

The electricity or regulatory law should be written (or amended) to give the regulator explicit authority to vary its regulatory rules and procedures (concessions vs. licenses vs. permits) depending on the nature of the entity that is being regulated (small vs. large, grid vs. off-grid, private vs. community based).

Principle #4 Quality of service standards must be realistic, affordable, monitorable and enforceable

➔ **Realities:**

- Quality costs money
- Initial standards (technical and commercial) are often set by the government entity that provides subsidies
- Customers (and politicians) will get angry if the regulators fails to enforce the standards
- Uniform national Q of S standards hurts electrification

➔ **Key Questions (All Technologies):**

- Minimum attributes of the components versus performance of the system or both?
- How many quality-of-service parameters?
- How large are the penalties?
- Penalties paid to whom?

Principle #4 Quality of Service Standards …continued …

➔ **Key Questions for Solar Home Systems:**

- Who is responsible for non-performance? Operator, customer or God?
- How do you decide?

➔ **Examples:**

- **Argentina SHS 2000:** Jujuy off-grid concessionaire – (i) response times too short; (ii) operator responsible - for all SHS battery failures
- **Bolivia SHS 2005:** Technical Control Unit TCU + two reporting forms + user can complain to municipality + TCU contracts out sample audits
- **Philippines:** distribution code “lite” for mini-grids?

Principle #4 Quality of Service Standards …continued …

➔ **Recommendations:**

- Base standards on customers' preferences and willingness to pay.
- Standards need not be uniform across all customer categories or geographic areas.
- Standards for both technical and commercial dimension of service.
- Service levels and penalties/rewards should be phased in over time.
- Where feasible and efficient, penalties should be paid to individual consumers.
- Any changes in standards should be synchronized with changes in tariff levels. (Quality costs money.)

Not just for electrification!

Elements of a Model Law

➔ The four regulatory principles should be embedded in legal instruments (law or decree)

1. Flexibility To Allow Other Entities to Act On Behalf of the Regulator.
2. Flexibility In Regulatory Methods.
3. Eligibility And Authorizations.
4. Tariff Setting.
5. Subsidies.
6. Quality Of Service.
7. Coordination with Other Government Entities
8. Model Documents.

Success in Tanzania—the new draft Electricity Act!

“The First Installment”

- Focus was on off-grid electrification
- Future work (Grid and Off-Grid Electrification)
  - Tariff levels and structures (with and without metering)
  - Need to coordinate tariffs and subsidies
  - “Regularization” of informal service providers
  - Varying regulation to accommodate different forms of bidding (minimum subsidies, minimum connection charges and minimum tariffs)
  - More on delegated regulation
  - Franchising of SMEs? (A marriage between the “big” and “little”)
- Future work needs to go “deeper” (more examples) and “wider” (more principles)