

**Engineering, Economics & Regulation of
the Electric Power Sector**

ESD.934, 6.974

Session 24

Module N

**Universal access to
electricity**

Regulatory approaches to rural electrification

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One of the major obstacles to energy sustainability is the lack of universal access to modern energy services

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What is meant by “a sustainable energy model”?

- **Tolerable environmental impact**
- **Adequate economic development**
 - Security of supply
 - Lasting & dependable access to primary energy sources
 - Adequate capacity of production, transmission & distribution
 - Plus security in system operation and power delivery
 - Acceptable or even beneficial impact on economic competitiveness although not necessarily indefinite growth
- **Socially acceptable**
 - Reasonably fair **universal access** (*worldwide*) to modern forms of energy supply

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Regulatory reforms in the electricity sector & energy access to the poor

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*Electrification and Regulation: Principles and a Model Law.
K. Reiche, B. Tenenbaum, C. Torres; July 2006 WB Group

*Reforming Power Markets in Developing Countries: What
Have We Learned?

J.E. Besant-Jones; September 2006 WB Group

*Energy for Sustainable Development: Policy Options for
Africa

May 2007, UN Energy/Africa

*Regulatory Approaches to Rural Electrification and
Renewable Energy: Case Studies from Six Developing
countries

E. Martinot, K. Reiche; June, 2000, WB Group

Power sector reform & universal access

- Diverse studies have examined the impact of energy sector reforms on energy access for the poor in developing countries
 - The questions
 - How have energy policy reforms addressed the energy access by the poor & what have they contributed?
 - What are the proven energy options that lead to improved & more sustainable energy services for the poor in developing countries?

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Significant findings On the impact of regulatory reforms (1)

- Over the past two decades, developing countries have often implemented market-led energy sector reforms
 - Impetus was given to this approach by major international funding agencies, which often required restructuring as a condition for loans
 - The role of the government was meant to be reduced to creating and enabling the environment within which the private sector would take the initiative to provide services

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Significant findings

On the impact of regulatory reforms (2)

- Evidence has accumulated that in many cases the reforms have not produced the expected results
 - In particular, the poorer members of society remain excluded from modern energy services
- The situation is the result of the nature of the reforms introduced
 - Market-led reforms on improved efficiency, with a reduced role for governments & no direct program focused on increased access, cannot address the energy problems of the poor

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Significant findings

On the impact of regulatory reforms (3)

- Safeguards should be introduced to avoid “cherry picking” by private investors
 - For example, electrification targets could be made a prerequisite for the purchase of attractive distribution rights
- Reforms should make sure that tariffs are affordable by the poor
 - Fixed charges & connection fees should be minimized

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Significant findings


Regulation for universal access (1)

- Rural electrification agencies should be autonomous & must have ambitious targets
 - Their governing boards should include representatives of the communities to be supplied to ensure that their concerns are properly addressed
- Countries whose reform is not at an advanced stage should make provisions for increased rural electrification before embarking on large scale privatization
- Avoid dependency from subsidies: if possible assign just once

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Significant findings

Regulation for universal access (2)

- The following elements have been identified as necessary part of any reform if access to electricity services for the poor is to be improved
 - A political commitment to improve access to electricity by poor households
 - Ring-fencing of finances for electrification
 - Explicit focus on poor households
 - Focus on the sequencing of reforms
 - Consultations with poor households on the electrification process (*successful projects are typically addressed to satisfy some basic needs of the people, e.g. get drinkable water, make possible some local industrial activity*)
-  The needs of the poor must be taken into account when designing reforms & this must be backed by political commitment

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Significant findings

Regulation for universal access (3)

- Characterization of electrification projects
 - Technology (*from grid extension to off-grid*)
 - Form of ownership
 - Delivery model (*fee-for-service, dealers, hybrids*)
 - Types of subsidies (*connection vs. consumption; targeted vs. untargeted*)
 - Process of selection of operators (*competition in the market or for the market, by project, by cluster, by yardstick*) & parameters to be bid (*tariffs, connection charges, minimum required subsidies, number of new connected consumers*)
 - Risk allocation (*between consumers, suppliers & government*)
 - Quality of service standards
 - Financing mechanisms

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Significant findings

Regulation for universal access (4)

- Universal access is (*or should be*) the priority concern, not subordinated to sustainable development in the political agendas
- The use of renewable energy (*isolated solar systems in particular*) needs proper investigation
 - Affordability issues (difference between grid & off-grid developments)
 - Education, adequate training & information are crucial in realizing any expected benefits

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Significant findings

Regulation for universal access (5)

- The four basic regulatory principles (*)
 1. Adopt light handed & simplified regulation
 - Do not suffocate small entrepreneurs / entities with red tape
 2. The national or regional regulator should be allowed (or required) to “contract out” or delegate, either temporarily or permanently, regulatory tasks to other entities
 - Make use of specialized agencies whose only purpose is rural electrification

(*) K. Reiche et al. “Electrification & regulation”, World Bank, 2006

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Significant findings

Regulation for universal access (6)

- The four basic regulatory principles (*cont.*)
 3. The regulator should be allowed to vary the nature of its regulation depending on the entity that is being regulated
 - Not the same regulatory treatment to a cooperative than to a for-profit private supplier
 4. Quality of service standards must be realistic, affordable, monitorable & enforceable
 - Standards should be based on consumers’ preferences & capacity to pay

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Significant findings

Regulation for universal access (7)

- Involvement of private capital is critical → define a viable business model
 - **Example: Chile.** Governmental agency issues a request for proposals each year, indicating the total amount of subsidies to be awarded
 - Selection criteria: maximize the social impact of subsidy: largest number of connections & lowest cost for end user
 - The subsidy turns unattractive projects for the private firms into attractive ones
 - Once built, the new facilities must be treated as any other distribution facility of the winning firm

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Thank you for your attention

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ESD.934 / 6.695 / 15.032J / ESD.162 / 6.974 Engineering, Economics and
Regulation of the Electric Power Sector
Spring 2010

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