

# <sup>1</sup> Who benefits from utility subsidies?

Based on

Water, Electricity, and the Poor: Who Benefits from Utility Subsidies?

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# Consumer utility subsidies are widespread

- Most residential customers are not charged the full cost of the water and electricity service they receive
  - Especially in the water supply sector
  - And in lower income countries
  
- Average residential tariffs only cover O&M plus some capital costs in:
  - 3% of water utilities and 25% of electricity utilities in low-income countries
  - 39% of water utilities and 29% of electricity utilities in upper middle income countries

# Cost recovery

- Percent of utilities in sample where average residential tariff appears to be...

## WATER

## ELECTRICITY

Country income level	WATER		ELECTRICITY	
	Too low to cover basic O&M	Covers O&M and partial capital	Too low to cover basic O&M	Covers O&M and partial capital
HIC	8%	50%	0%	83%
UMIC	39%	39%	0%	29%
LMIC	37%	22%	27%	23%
LIC	89%	3%	31%	25%

## Subsidies take many forms

- General subsidies to all, or subsidies targeted to a subset of consumers
- Consumption, or connection, subsidies
- Most common consumption subsidy is “quantity-based”
  - 80% of water utilities and 70% of electricity utilities
  - Usually an increasing block or “stepped” tariff
- Administrative selection and self-selection are also used to identify beneficiaries
- Subsidies may be funded by tax payers, customers, or commonly “unfunded”

## 5 Why are utility subsidies so prevalent?

- Utility subsidies are often a central plank of utility policy....
  - Cost recovery prices are not considered “affordable”
  - Subsidies are assumed to help guarantee service for the entire population
- Moreover, they can also be envisaged as an element of social policy
  - Transfers in kind may be practical alternative to cash transfers
  - Subsidies may be justified by merit good or externality arguments

# Subsidies as social transfers

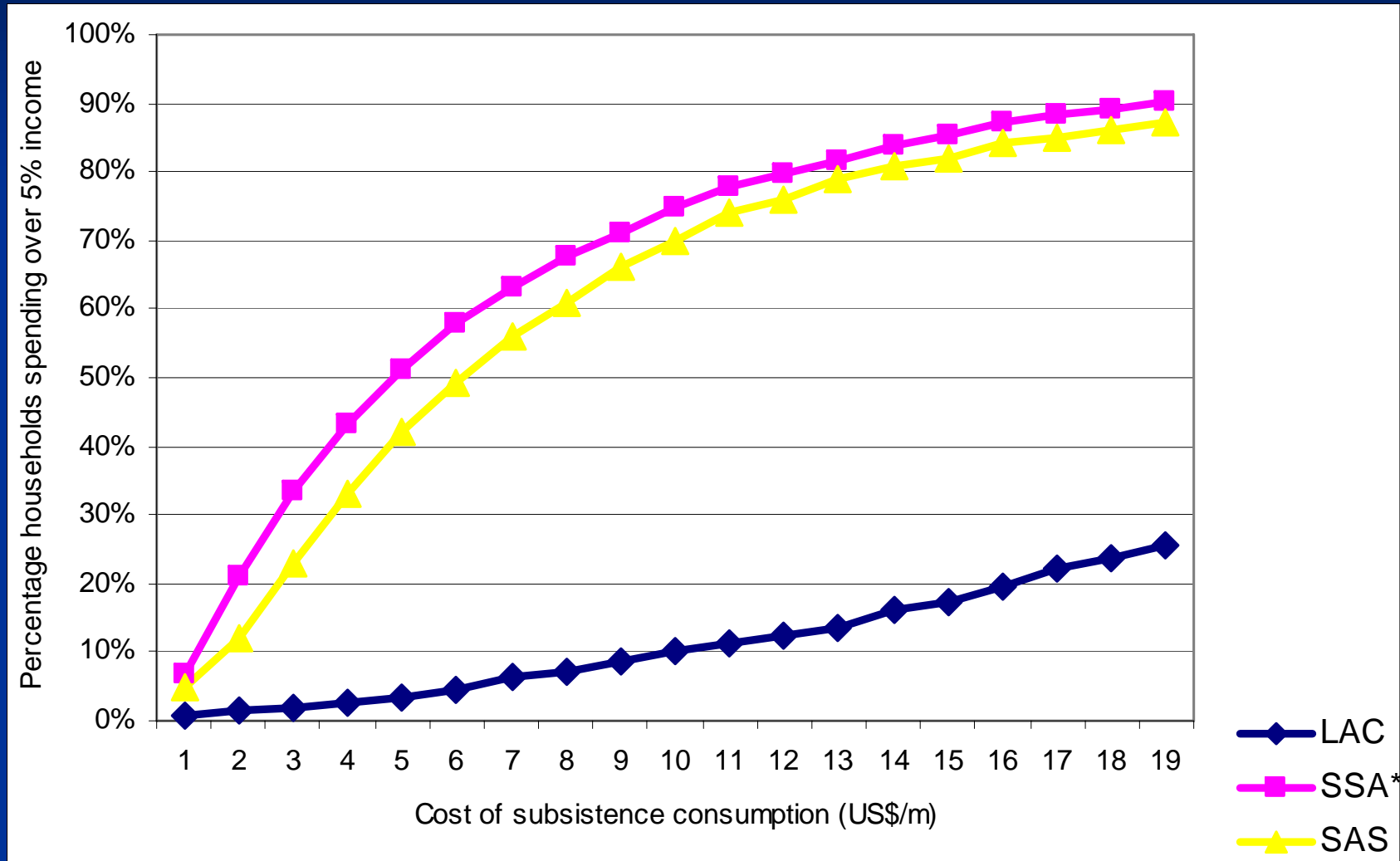
- Utilities are not obviously better candidates than other services for in-kind transfers

	Utilities			Other goods and services			
	Water	Sanit	Elec	Food	Educ	Health	Trans
Universal reach	*		**	***(1)	**	**	**
Inferior goods	**	**	*	***	*	*	*
Differentiable	**	**	*	***	***	***	**
Nontradable	*	**	*		***	***	*

*Note:* \*\*\* = often applies; \*\* = sometimes applies; \* = occasionally applies.

(1) Though lower for particular types of food

# Illustration of affordability issue



# Why do utilities lend themselves to subsidization?

- Cost structure makes it possible to get away with under-pricing in the near term
  - Capital costs account for 70-90% of total
  - Asset lives of 20 years or more are typical
- High percentage of non-attributable costs
  - Hard to assign costs to particular customers
- Monopoly services
  - Simplified monitoring & “non-tradability” of subsidy schemes

# <sup>9</sup> Why are these subsidies the subject of much debate?

- Concern about whether subsidies actually reach the poor...
- ...and whether in the process they produce collateral effects of various kinds
  - Impact of “unfunded” subsidies on customers
  - Effect on incentives
    - Inefficient water and electricity consumption
    - Disincentives on utilities to reduce costs, expand service

# <sup>10</sup> Who benefits from utility subsidies?

- Beneficiary targeting: Do subsidies reach the poor?
- Benefit targeting: What percentage of the benefits go to the poor?
- And why?
- Why care about targeting?
  - Lower subsidy budget
  - More bang for the buck
  - Fewer distortions in consumption decisions

# How did we answer these questions?

- Systematic comparison of case studies
  - Existing and simulated subsidies
  - From 13 water utilities and 27 electrical utilities from Asia, Latin America, Africa, and E.E./C.A.
  
- Estimation of the financial value of the subsidy:
  - Avg. cost of water or electricity received – amount paid
  
- Benefit targeting indicator:
  - % of benefits going to poor / % of pop that is poor
  - <1.00 regressive; > 1.00 progressive
  
- Determinants of targeting performance
  - Access rate, connection rate, targeting, subsidy per unit, quantity consumed

# Framework

All households:  $H$

Share of households with potential access:  $A_H$

Share of households with connections:  $A_H * U_{H|A}$

Share of households receiving the subsidy:

$$B_H = A_H * U_{H|A} * T_{U|A}$$

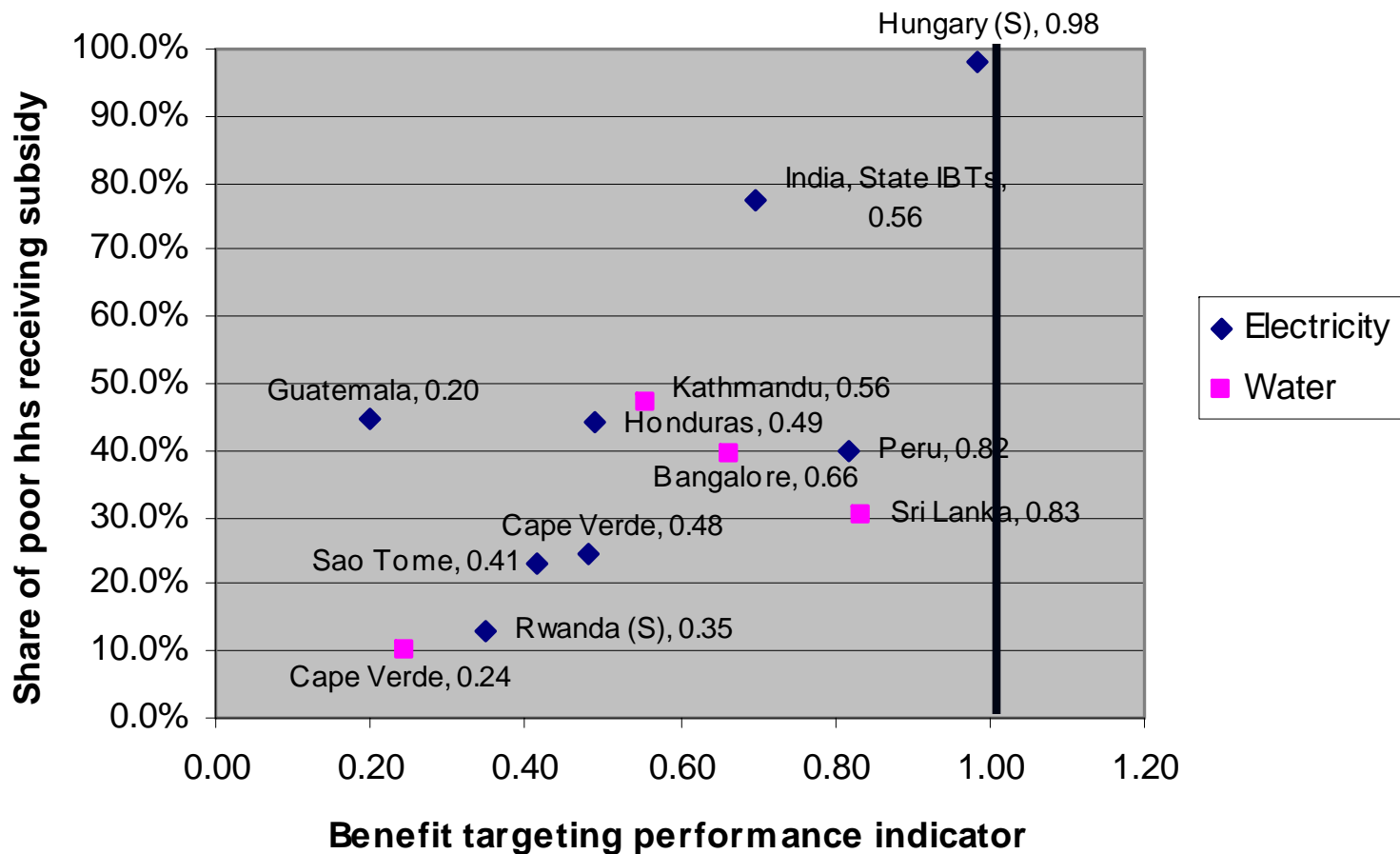
Average value of the subsidy received by  
a subsidy recipient:  $R_{HT} * Q_{HT} * C$

Average value of the subsidy across  
all households:

$$S_H / H = B_H * R_{HT} * Q_{HT} * C$$

# 13 Existing quantity-targeted subsidies are regressive

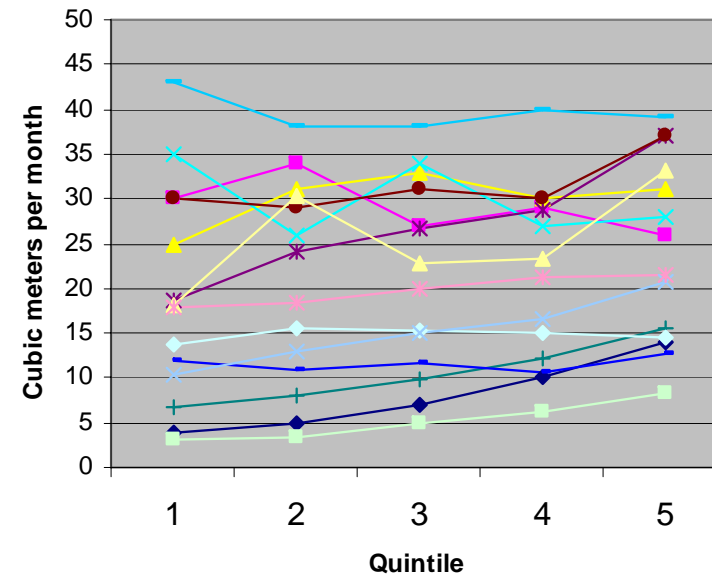
% of poor hhs receiving subsidy vs. benefit targeting performance



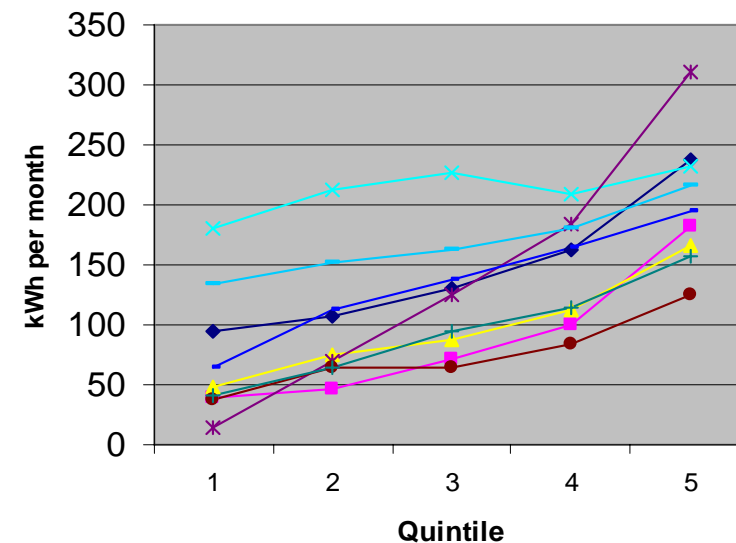
# Why? (1)

- Access, connection, and metering
  - Many poor households are simply not eligible
  
- But that is not all....
  
- Quantity-consumed is not necessarily a good indicator of poor households
  - Especially in case of water
  - The middle class and poor look very similar

Water consumption by quintile



Electricity use by quintile



## Why? (2)

- Most existing subsidies are general subsidies to all or almost all residential customers
  - Few households pay average cost or cross-subsidize others
- Quantity-targeted subsidies usually provide a greater subsidy per unit to low volume consumers, but...
  - A smaller subsidy over more units of consumption = a larger total subsidy
  - If there is a fixed fee, the smallest volume users pay the highest average price per unit
- Can quantity-targeted subsidies be improved by tinkering with the tariff structure?
  - E.g. reducing the size of the subsidized block of an IBT

# Can the targeting of quantity-based subsidies be improved?

- Tinkering with the tariff won't help households without access, connections, or meters
- Two changes could help **marginally** improve targeting performance:
  - Very small first block of an IBT
  - Moving from an IBT to a “volume-differentiated tariff”
- But **only if**
  - (1) poor consume significantly less than the nonpoor, and
  - (2) avg residential tariffs are at or near average cost
- Improvement would be easiest for **electricity** utilities with a **high degree of cost recovery**, located in areas with **high coverage** of connections and **meters**

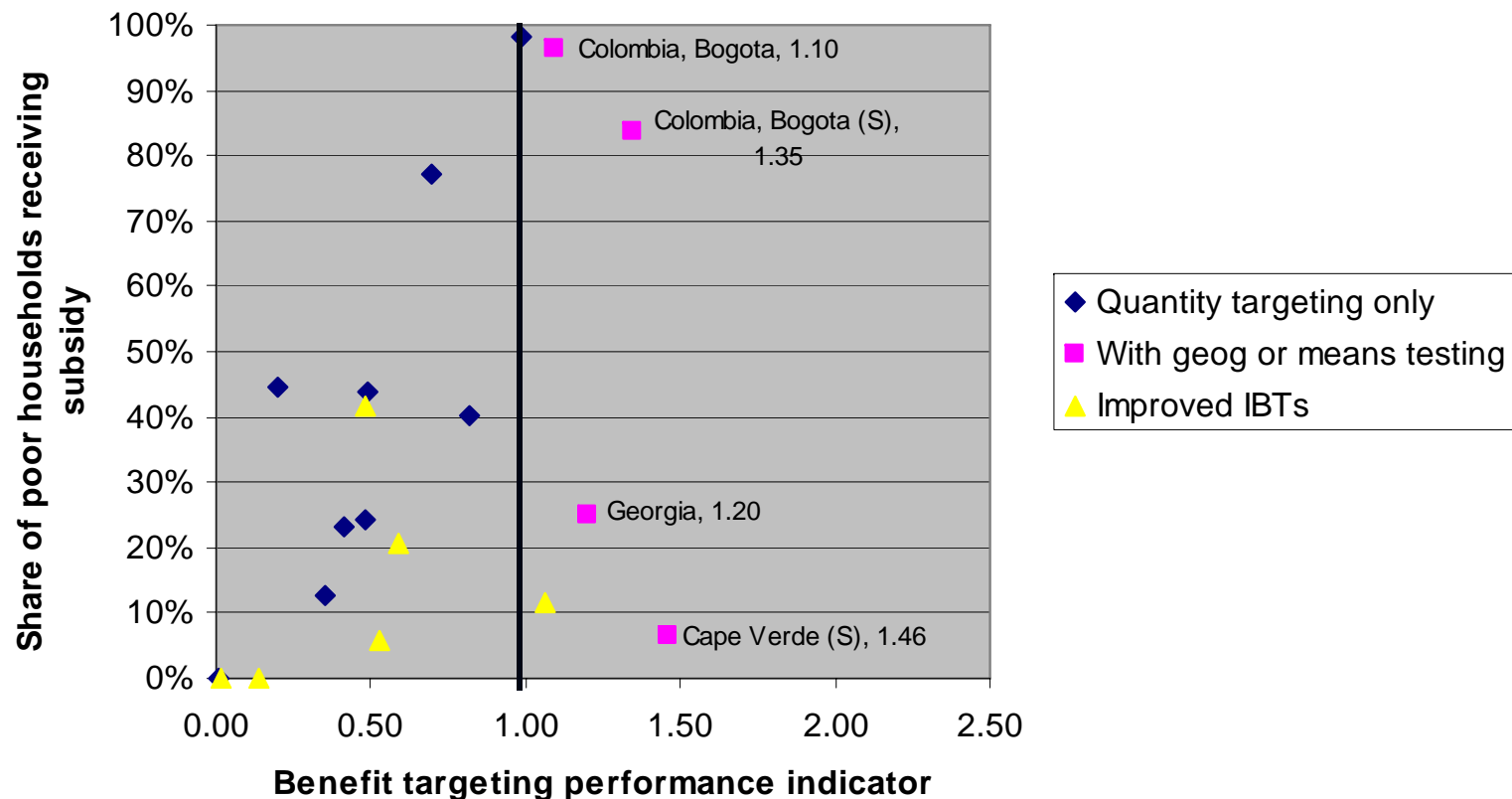
## Effects of Tariff Modifications on the Factors that Determine the Benefit Incidence of Quantity-Targeted Subsidies

	Reducing the first block of an IBT	Moving from an IBT to a VDT, or reducing the subsidy threshold in a VDT
Access ratio	No effect	No effect
Uptake ratio	No effect	No effect
Targeting ratio	No effect unless the prices in subsequent blocks exceeds average cost	Will improve
Subsidy rate ratio	Will improve	Will improve
Quantity ratio	Will remain $< 1.00$	Will remain $< 1.00$

*Note:* Predictions assume that poor households consume less on average than nonpoor households.

# What about consumption subsidies with other targeting methods?

Benefit and beneficiary incidence of electricity consumption subsidies



## Are alternative subsidies any better?

- Geographic targeting raises  $\Omega$  to around 1.00, with relatively low errors of exclusion (30%)
- Means-testing lifts  $\Omega$  to around 1.30, but at the cost of raising errors of exclusion (60%)
- Service-level targeting of consumption subsidies
  - Self-selection: are the poor more likely than non-poor to choose a lower service level?
    - Rare in electricity sector
    - Subsidies for public water taps
      - Bangalore  $\Omega = 2.14$ ; Kathmandu  $\Omega = 1.54$

# Are connection subsidies the answer?

- Benefit goes beyond the cost of the connection itself
- Lack of coverage is itself a good poverty indicator (particularly in higher coverage contexts)
  - Untargeted simulations:  $\Omega > 1$
  - Targeted simulations:  $\Omega = 1.5$
- However, there may be other serious barriers to connection
  - Difficulties in expanding networks to informal areas
  - Evidence of low hook-up rates even where network exists
  - Illegal tenure appears to be a major issue

# Do utility subsidies make a significant social policy impact?

- Utility subsidies are a significant percentage of the income of the poor
  - Water: 3-4%
  - Electricity: 2-8%
- Depending on access patterns utility subsidies may reduce or increase income inequality
  - Africa: increase inequality
  - Latin America: reduce inequality
- Simulations suggest that with 50% tariff increase poverty rates could increase by 1-2%

# 22 Targeting performance comparable to other social schemes by method

Median targeting performance, by type of subsidy and targeting method

	Consumption (Quantity)	Geographic	Means-testing	Self-selection (Service level)
<b>Water</b>				
Existing Cons	0.60	1.05	1.36	1.84
<b>Electricity</b>				
Existing Cons	0.63	0.90	1.23	-
<b>Other*</b>	1.00	1.33	1.40	1.78

\*From Coady et al study on targeting performance of social transfers

## Parting thoughts:

# Subsidies as “pro-poor” utility policy

- Keeping services affordable for the poor?
  - Only for the connected poor (with meters), who are accurately identified by the targeting mechanism
  
- What about low coverage situations?
  - Connection subsidies are most likely to reach the poor, but...
    - There may be other barriers to connections (tenure status, cost of fixtures, billing practices, good alternatives)
    - Connecting more households to a service burdened by “unfunded” subsidies will only further erode bankrupt utilities

## Parting thoughts:

### Prices, subsidies, and cost recovery

- There is no easy way around the need to increase levels of cost recovery if service is to be improved and expanded.
  - The removal of existing regressive subsidies is widely unpopular.
  - Improving the targeting of subsidies won't change that.
  
- But raising prices or securing alternative sources of subsidies are not the only possible tools:
  - Improving revenue collection
  - Reducing operating and especially capital costs
  - Removing impediments to more flexible service levels, technologies, and modes of provision