



International Copper
Association Mexico
Copper Alliance

Positive impacts of energy efficiency on the electricity services for the urban and peri-urban poor in Brazil

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- ❑ Pilot project overview
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- ❑ Community involvement
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- ❑ Outcomes
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Leading organization promoting copper worldwide

Headquartered in New York, regional offices in

- **Brussels, New York, Santiago, Singapore**

31 offices in 24 countries on 6 continents

Active in over 60 countries

Sustainable Energy

- Energy efficiency
- Renewable energy
- Electrification – slum, rural

Other initiatives: Building Construction, Health and Environment, Technology

Natural partner in sustainable development and energy efficiency

1 billion people live in urban/peri-urban slums

- 1/3d of world urban population, many in megacities
- growing 5% per annum

Brazil: 52 million people live in favelas (29%)

Inadequate access to electricity services

- theft of power
- unsafe conditions
- waste of energy

Background

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24 municipalities in 4,526 km²

1.82% of SP state

8.8% of BR population

12.2% of BR GDP

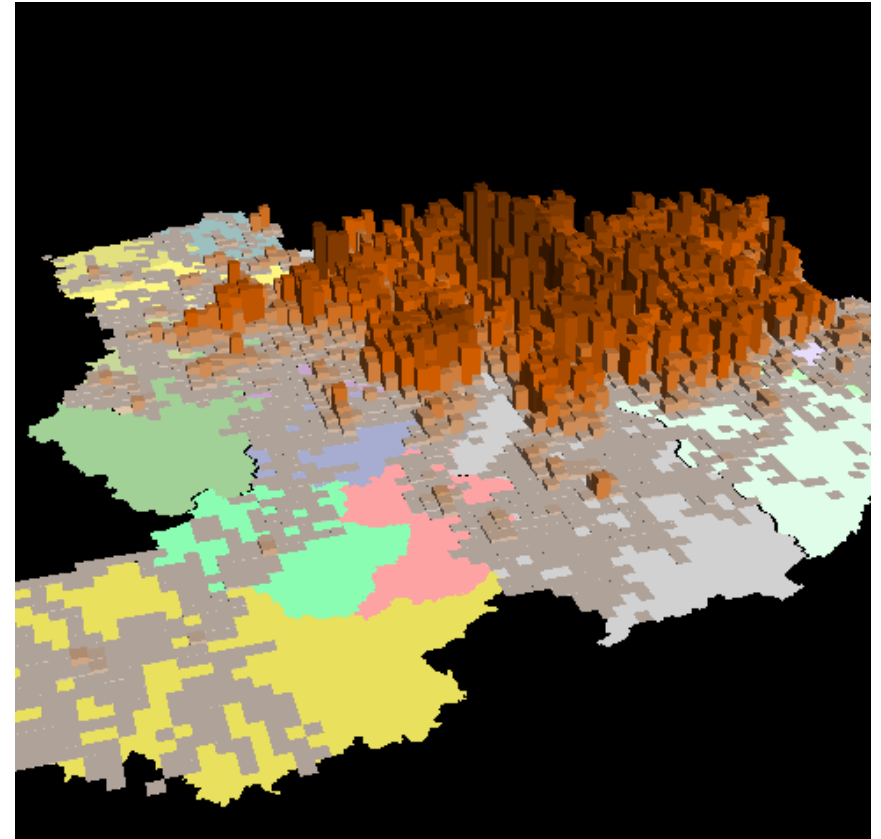
36.7% of SP GDP

6.0 million clients and

18.0 million inhabitants

1,126 clients / km²

10%BR's and 35%SP's
(consumption)



Background

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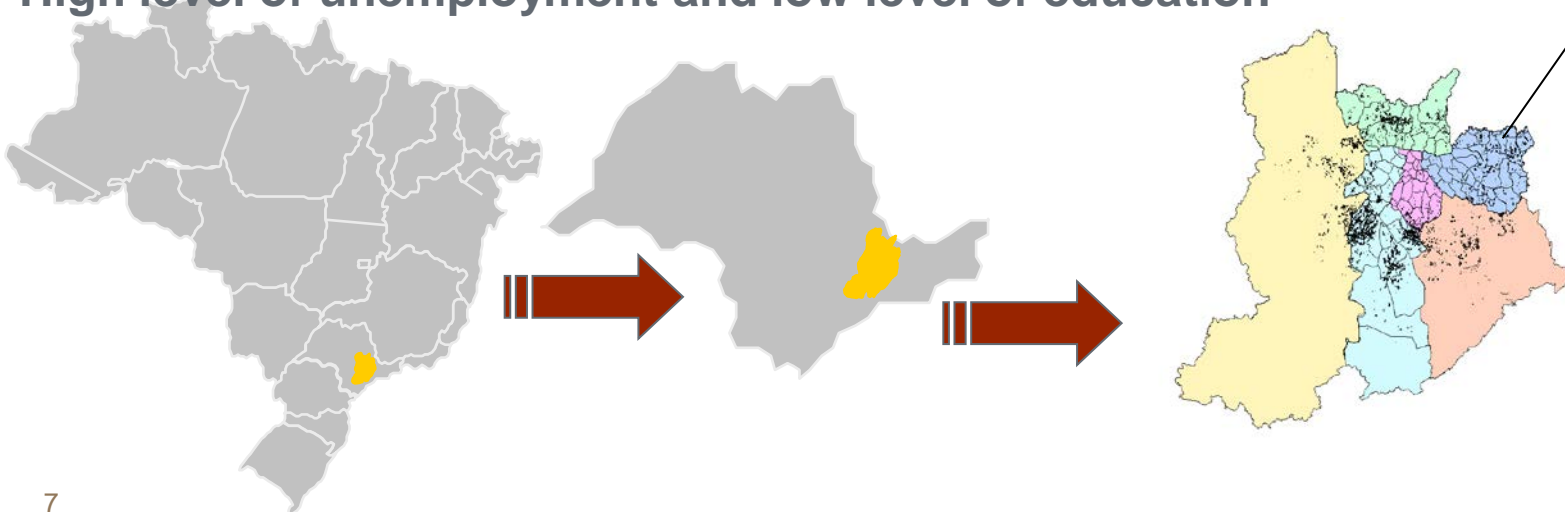
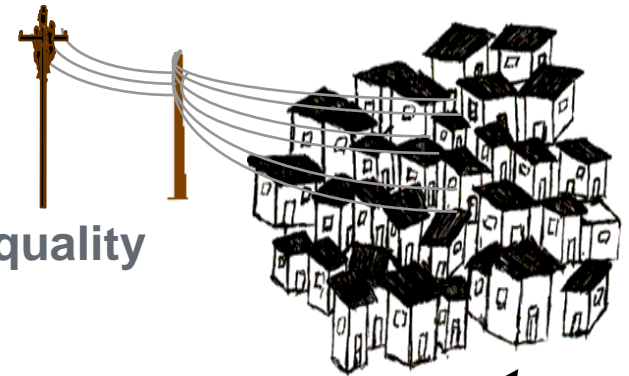
2,000 slums with more than 1.5 million people

At least one fire per month

Many domestic appliance are damaged due to low quality power supply

Over consumption due lack of paying culture by customers

High level of unemployment and low level of education



Paraisopolis Project – AES Eletropaulo / ICA / USAID

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Pilot project to test the methodology and package of solutions

ICA provided co-funding and technical support.

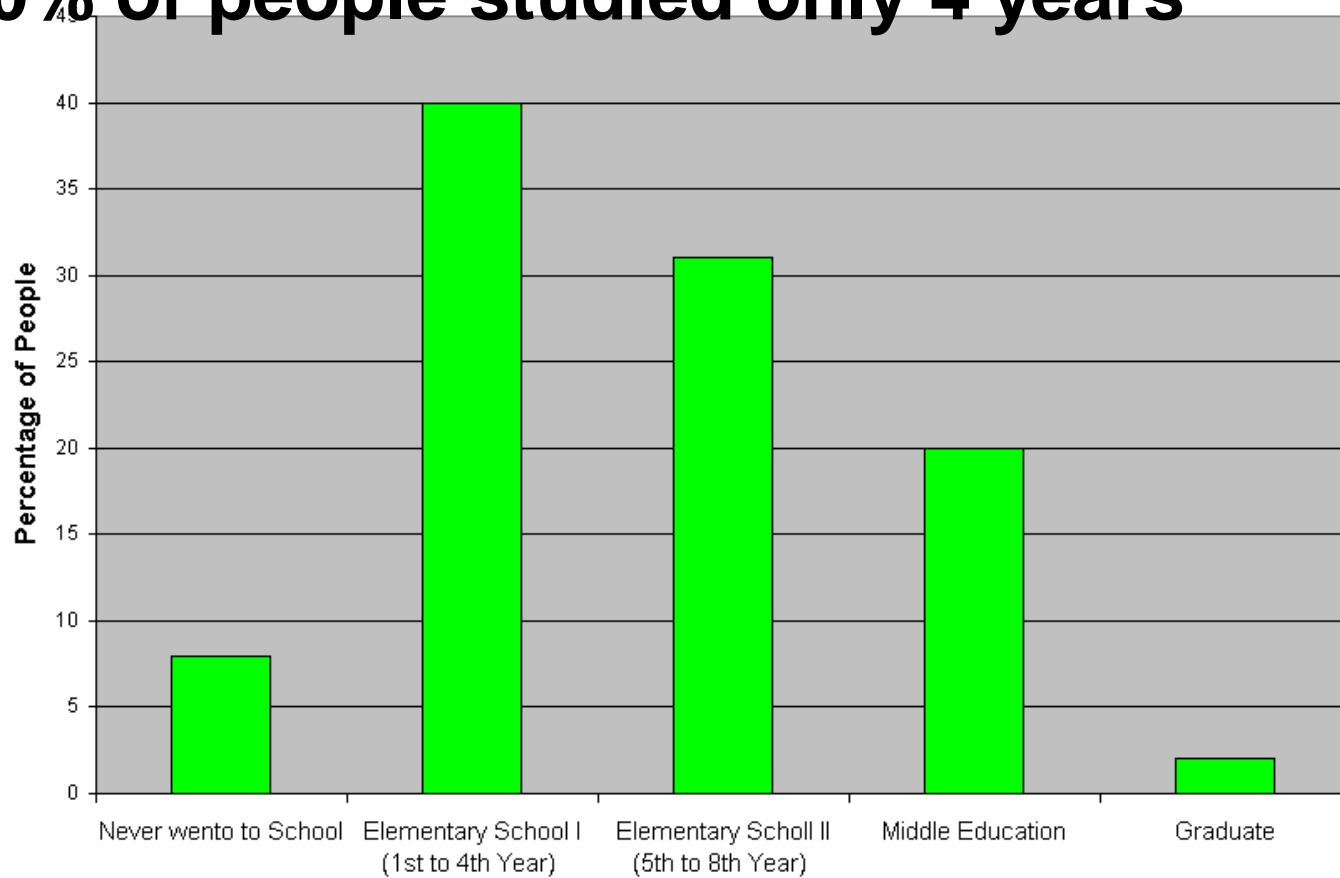
USAID provided co-funding and social worker support

Business plan shows a pay back time of 1.4 years and IRR of 276%

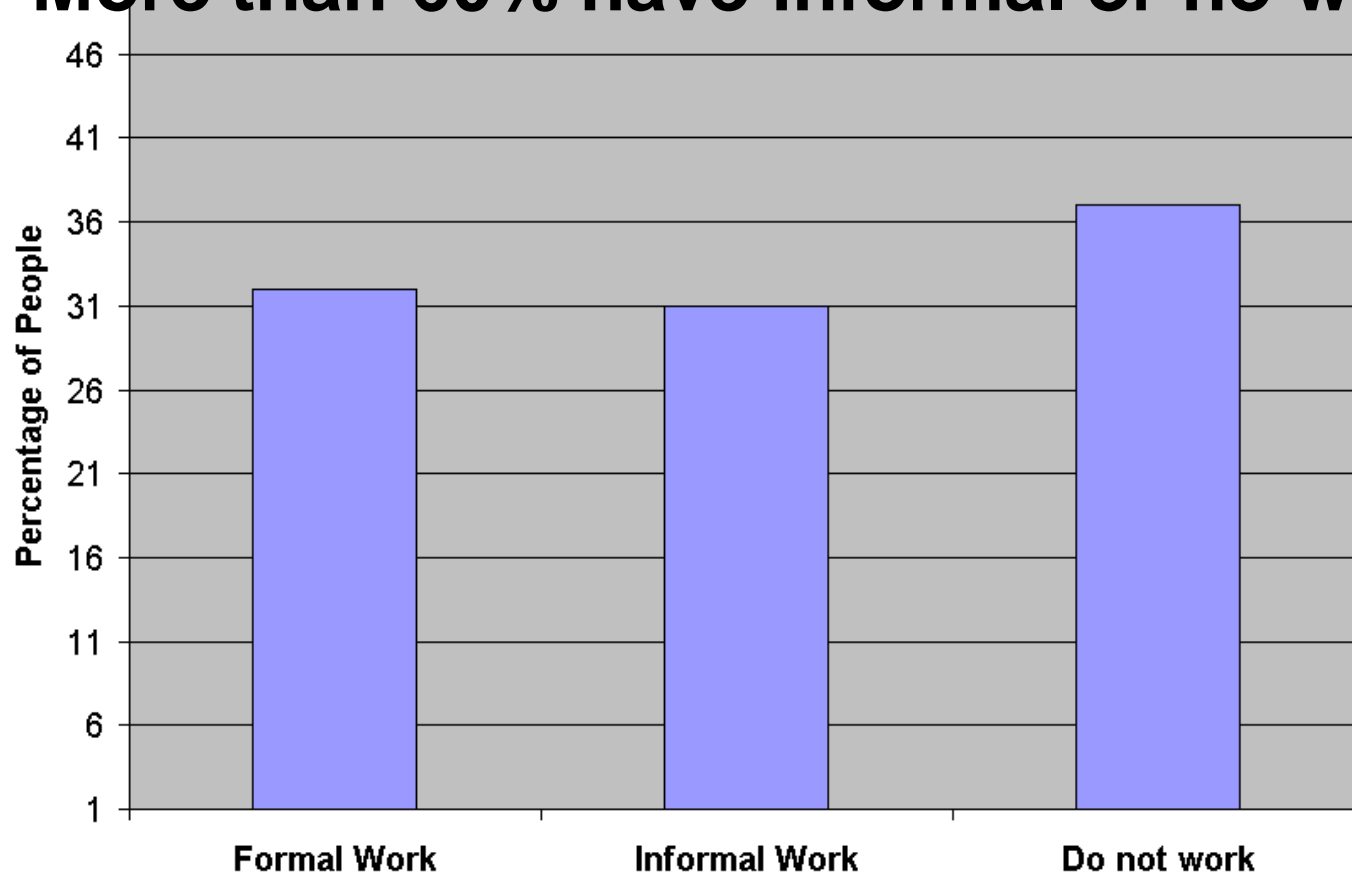
Customer consumption reduced on average by 40%



40% of people studied only 4 years



More than 60% have informal or no work



Pre-project status

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Low efficiency in distribution transformers and cables

Illegal connections (98% non-paying)

No public lighting in side streets, alleys, parks



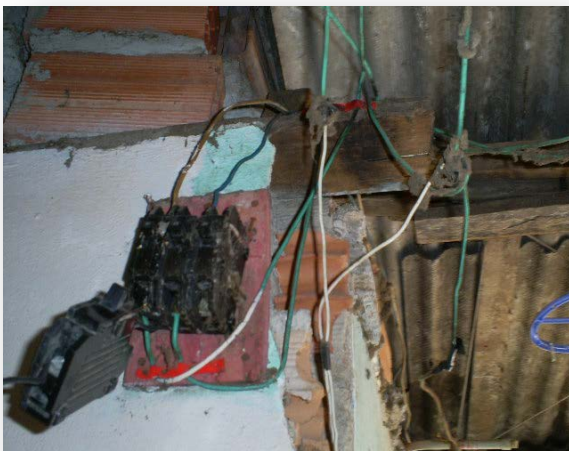
Pre-project status

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No or broken or bypassed meters

Unsafe home wiring (electrical fires, injuries)

Energy “in-efficiency” of lighting and appliances



Community involvement

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Pre- and post-regularization awareness campaigns



Lectures at schools



Upgrading distribution network

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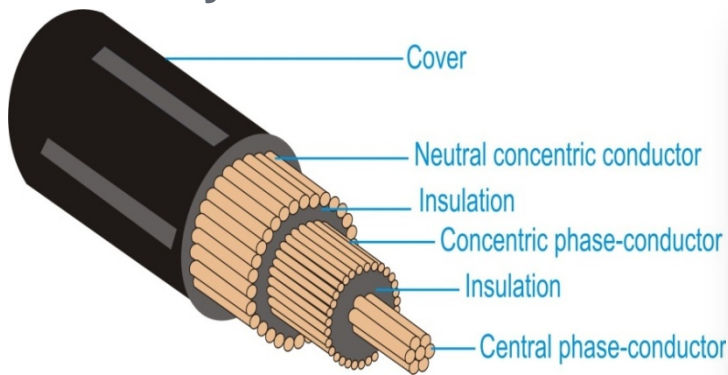
Energy efficient distribution transformers

Bi-coaxial drop cables

Public lighting

Electronic metering (remote control)

Secondary distribution cables



Reducing consumer energy consumption

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	Aver. Savings kWh/month/home
Upsized wiring:	11
EE refrigerators:	48
CFL lights:	38
Public lighting	4
EE showers	18



Budget and Outcomes

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\$1.9 Million pilot project

Energy savings in pilot area: 229,000 kWh/month

from EE transformers, EE refrigerators, homes rewired, EE water heating (with solar water heating added in subsequent roll-out), CFL's, metered connections

Average annual savings per household: 40~50%

Brazilian government planning replacement of 10million refrigerators with EE models

Post-pilot investment in Sao Paulo: \$70million to-date serving 1.1million people in 751 slums

Payback from utility perspective: 1.6 years

Community satisfaction

- Citizenship
- Affordable energy
- Safety
- Bad debt rate down to 12%
- Job protection through safeguarding of commercial enterprises

International Workshop

Adaptation projects planned: e.g. Mumbai, Dakar...

Dissemination of case study

Key requirements

- utility & community commitment
- public-private partnership
- financing

Thank you

For more information please contact
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