



World Bank / ESMAP
Energy Access for the Urban/Peri-Urban Poor

Achieving Balance Between Investment
Cost Recovery and Benefits to Consumers

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Claudio Damiano
Argentina

cdamiano@enre.gov.ar
cladamiano@yahoo.com



Electricity is Pioneer in servicing slums:

Let us picture two different attitudes, from the “Restrictions-to-illegal-energy” point of view:



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HIGH RESTRICTION



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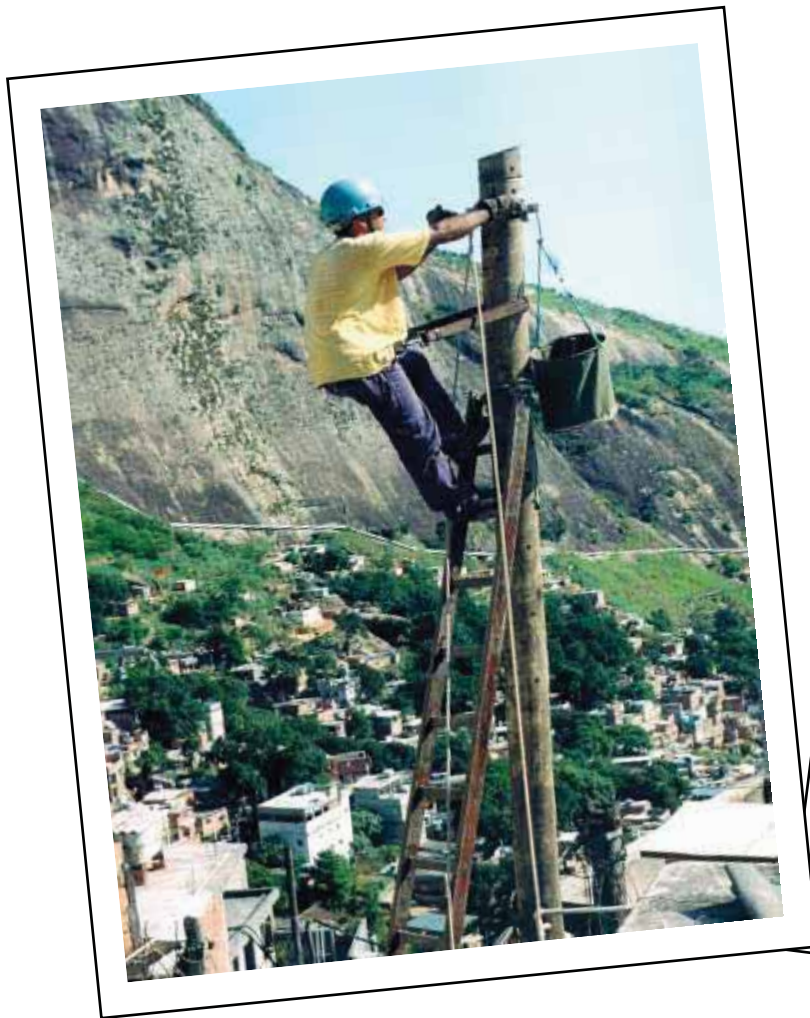
HIGH RESTRICTION



LOW RESTRICTION

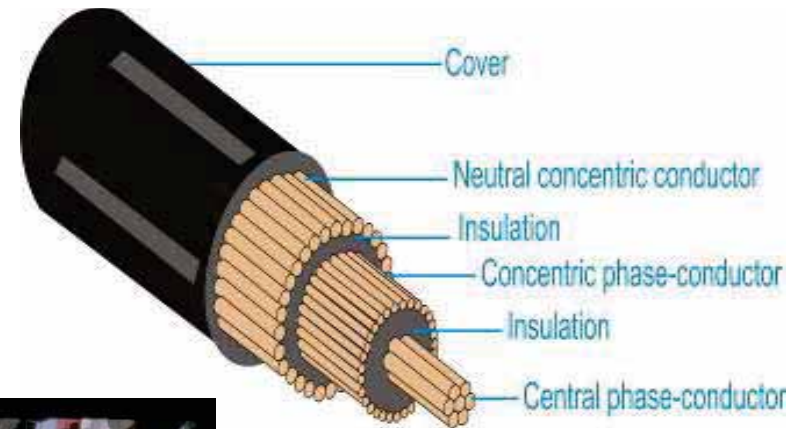
Their characteristics....

High Restriction: high operational costs in disconnecting-reconnecting (danger)



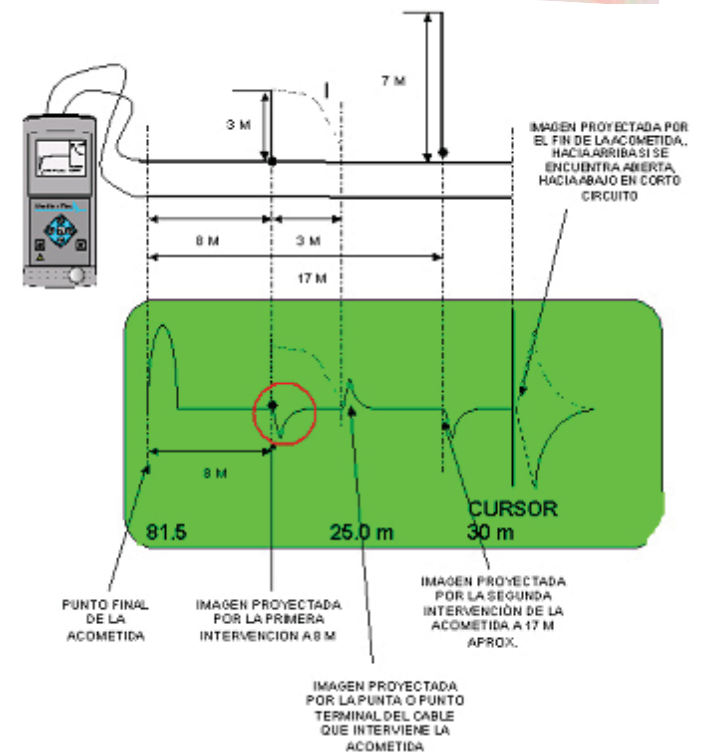
High Restriction:

- intensive use of anti-theft technologies,

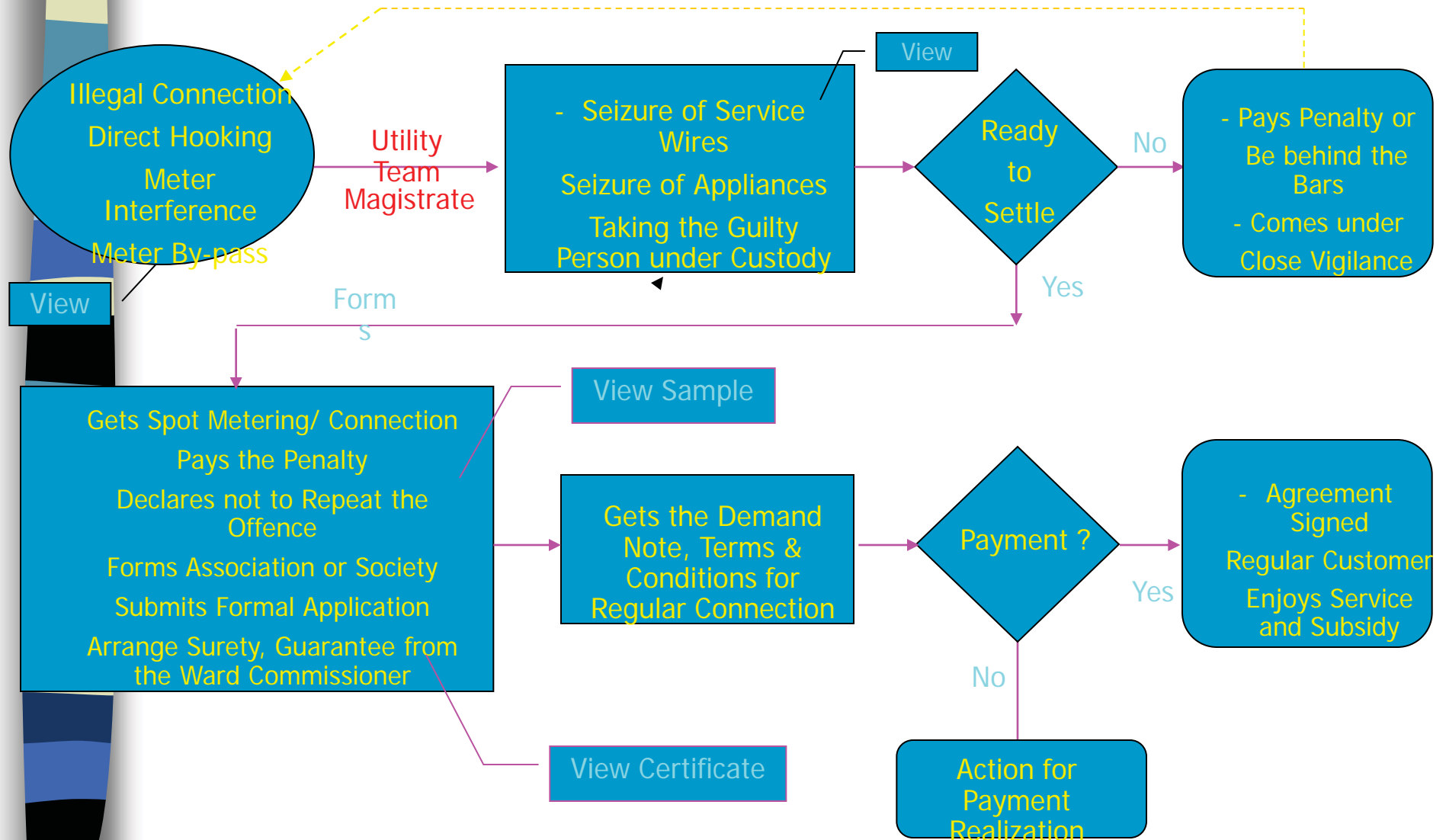


High Restriction:

- strong surveillance of the grid



High Restriction: developed anti-theft legal systems



And now ... Low Restriction:

- high non-technical losses
- low power quality



Low Restriction: Frequent electrical accidents



Low Restriction: few energy efficiency practices



24 x 7
ON!!





Intuitive cost estimation: A restriction coefficient - extremes

Low restriction

Coefficient 0% = all you can eat, for free.

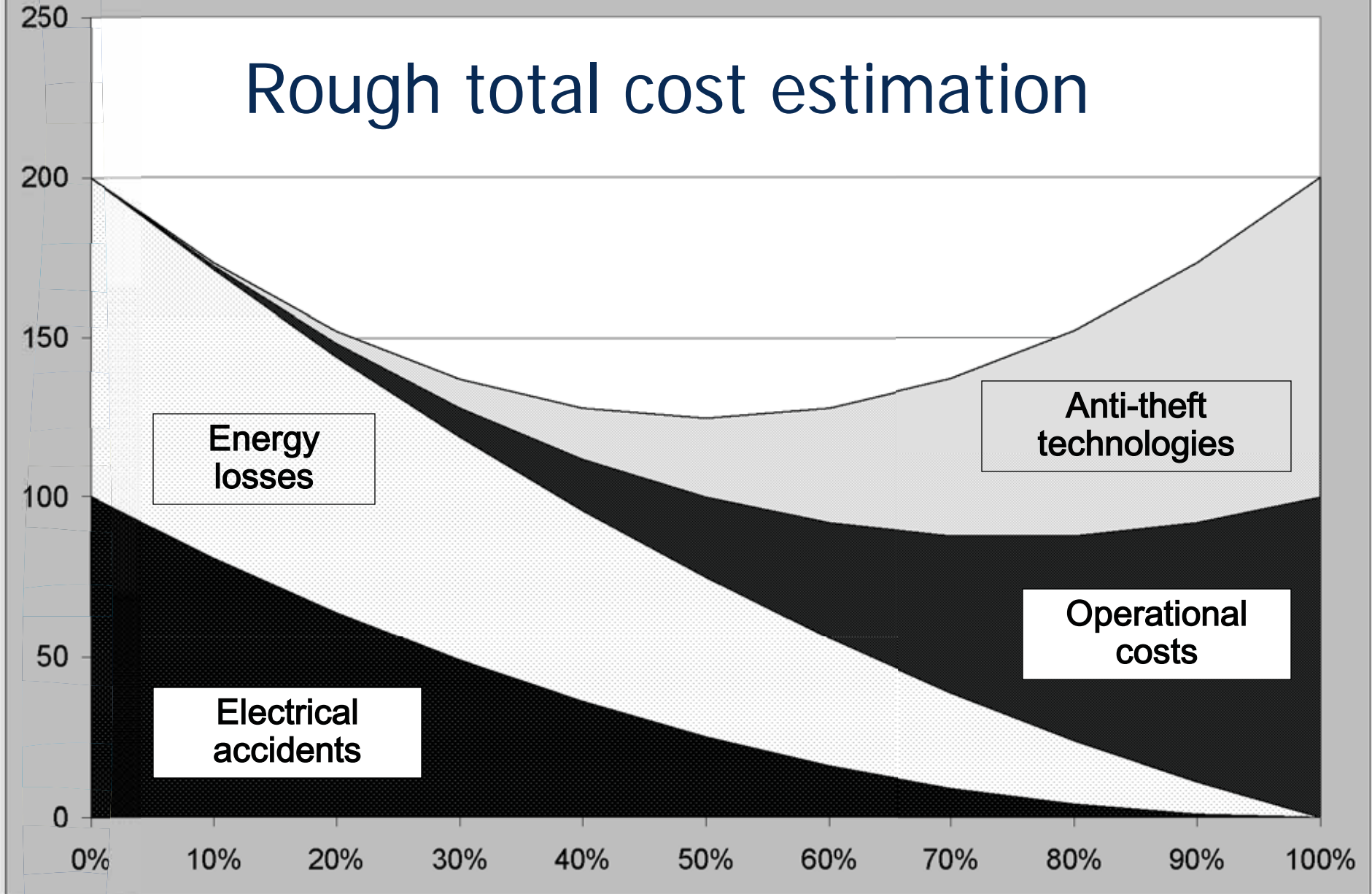
Main costs: human harm, energy losses, bad power quality, anti-competitive activities, intermediation of non authorized agents, no energy efficiency.

High restriction

Coefficient 100% = everybody pays, including who could not do so, who should pay upfront.

Main costs: investments, operational, legal, surveillance.

Rough total cost estimation





Lowest and highest restriction: what is in between?

Rough total cost estimation on
extreme low or high restriction policies,
make us presume they are
costly for society.

For going away of such a situation,
and seeking for a lower-cost intermediate point,
here is a summarized proposal based on
**granted electricity for basic needs
in eligible houses.**



Exploring a better situation First step: Who and Where

Eligible houses are defined,
trying to reduce inclusion and exclusion errors
(for instance):

WHO: Use of welfare and tax information.

WHERE: Use of geo-referenced information.

Afterwards, we will go on HOW.

WHO and WHERE:

Houses with “volatile income” could be found concentrated (urban slums)...

(commonly supplied with community meters, billed to local, provincial or national administration: almost zero coefficient)



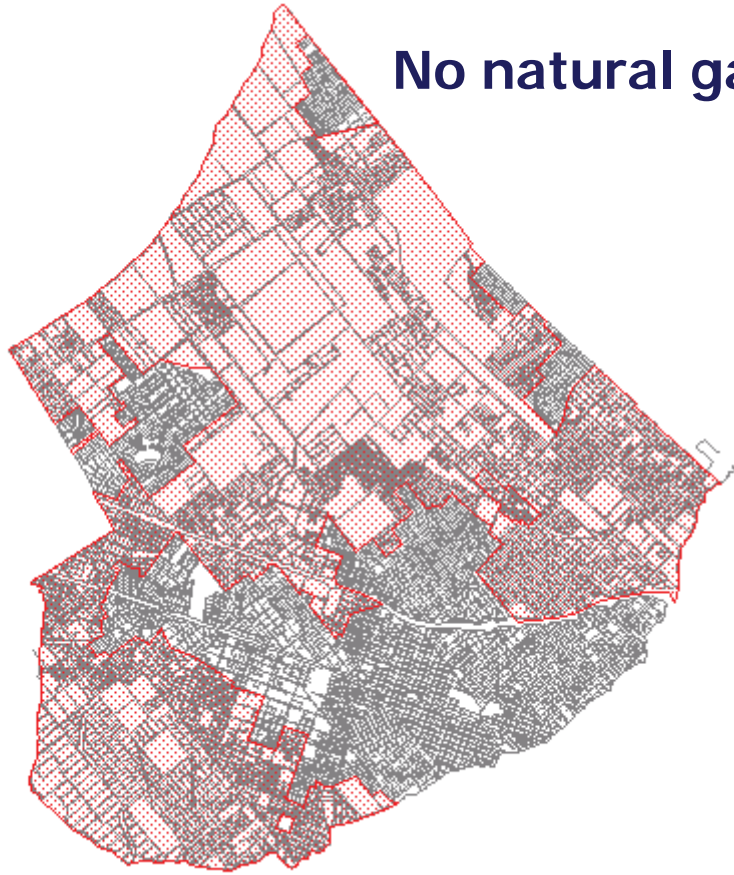
but also scattered in the urban area ...
(usually supplied with subsidized low-priced kWh,
and frequent illegal connections)



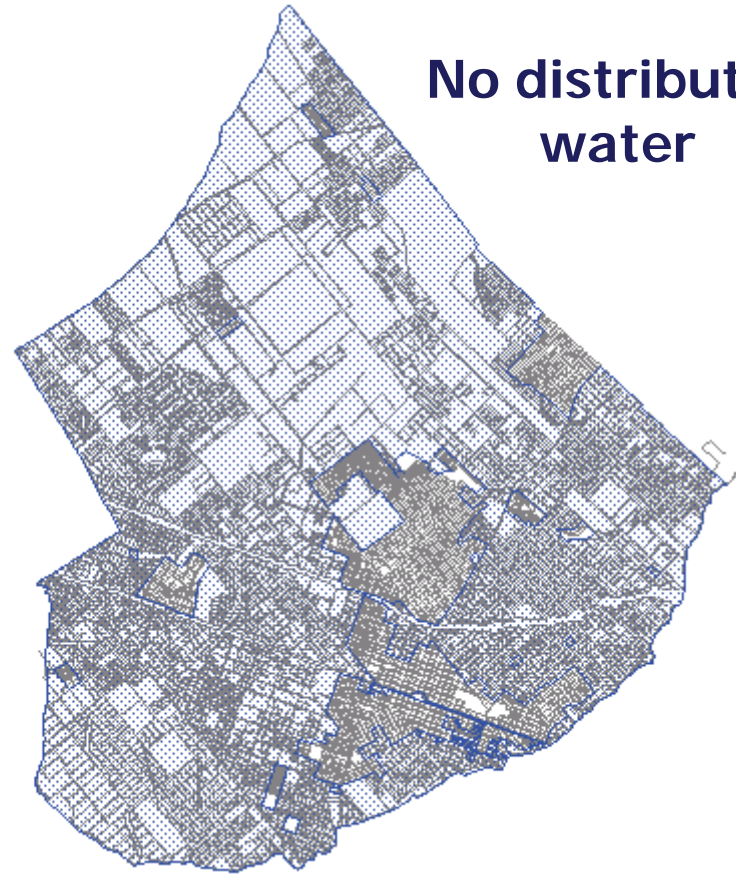


... that's why georeferenced data could be used...
(from other utilities, for example)

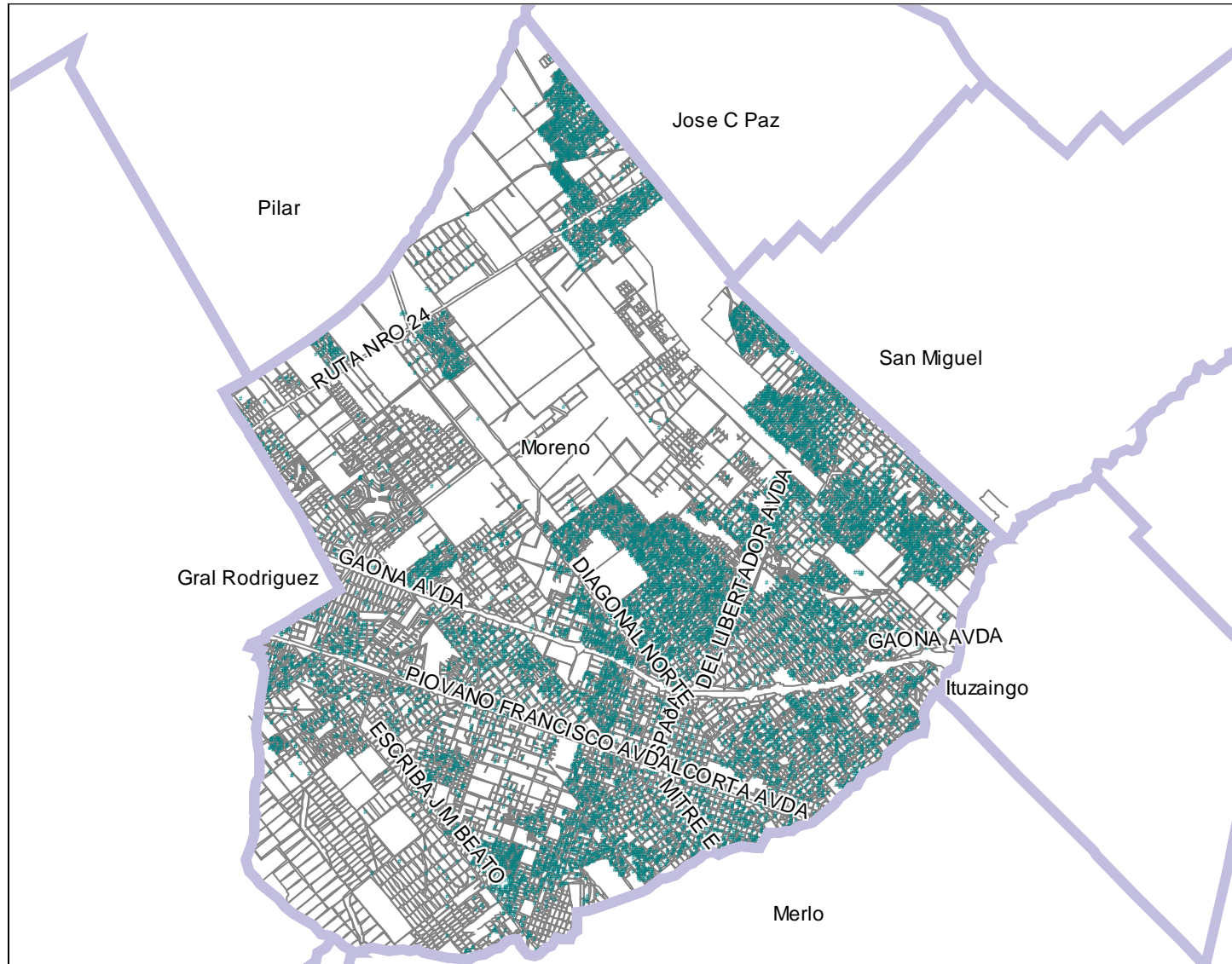
No natural gas



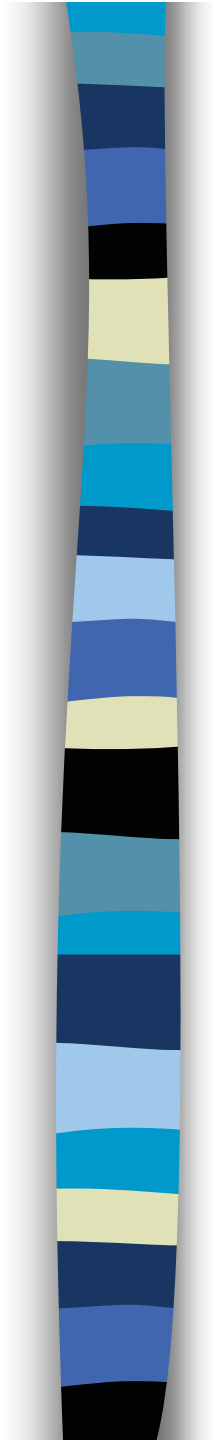
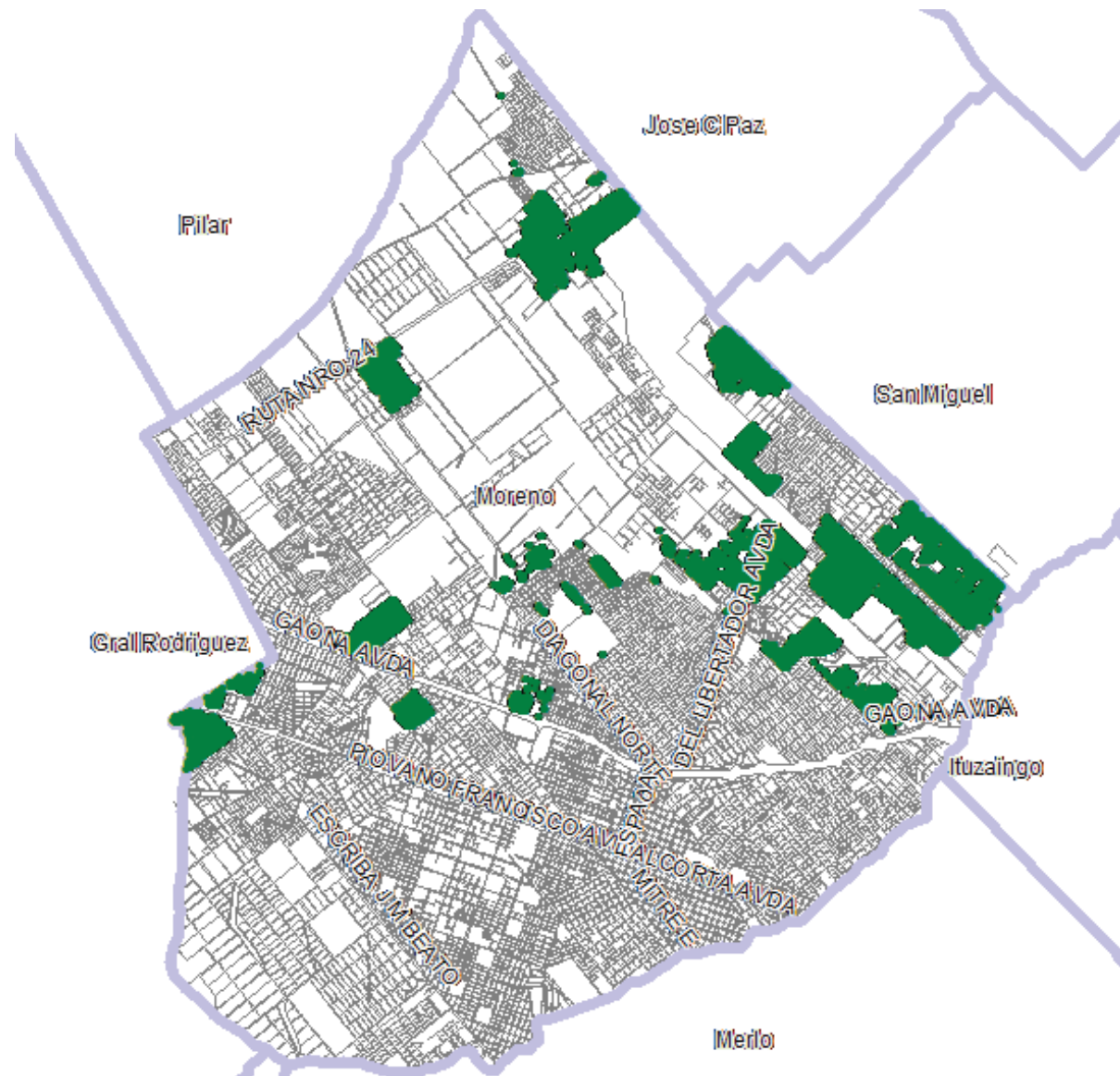
**No distributed
water**



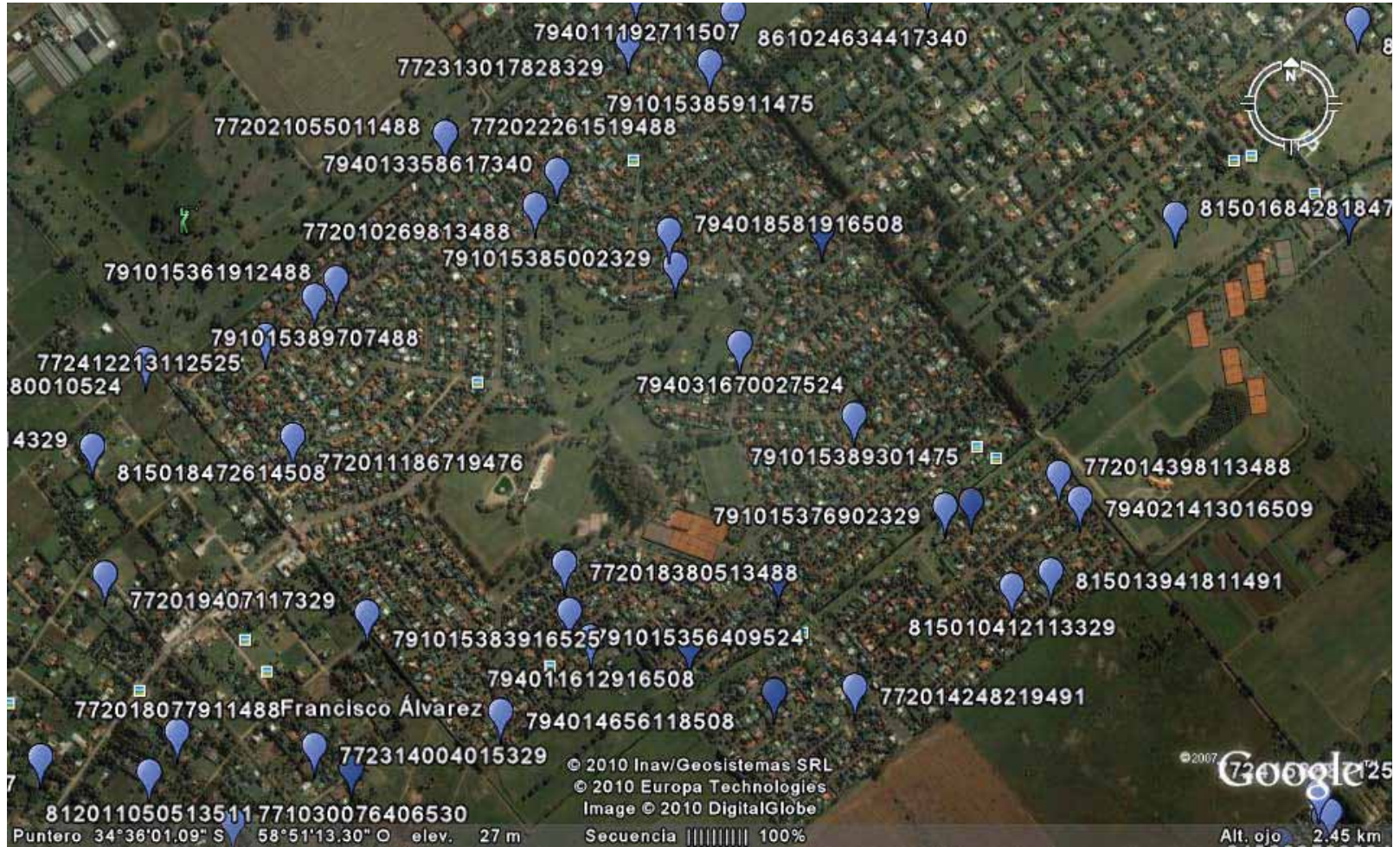
... combined with welfare and taxes information...



... for determining Eligible Areas...



... and Eligible scattered Consumers.





Having obtained WHO and WHERE, we can go to
HOW to supply

Proposal:

1. Set an amount of energy for the eligible area, considering the needs to be covered with electricity.

Example:

thermal uses? Heating, cooking? is LPG conveniently available?

SIMULATION (kWh)		
available network		monthly consumption (avg. winter-summer)
water	gas	
yes	yes	74
yes	no	133
no	yes	91
no	no	150

Be careful,
this is for granted

HOW to supply - Proposal:

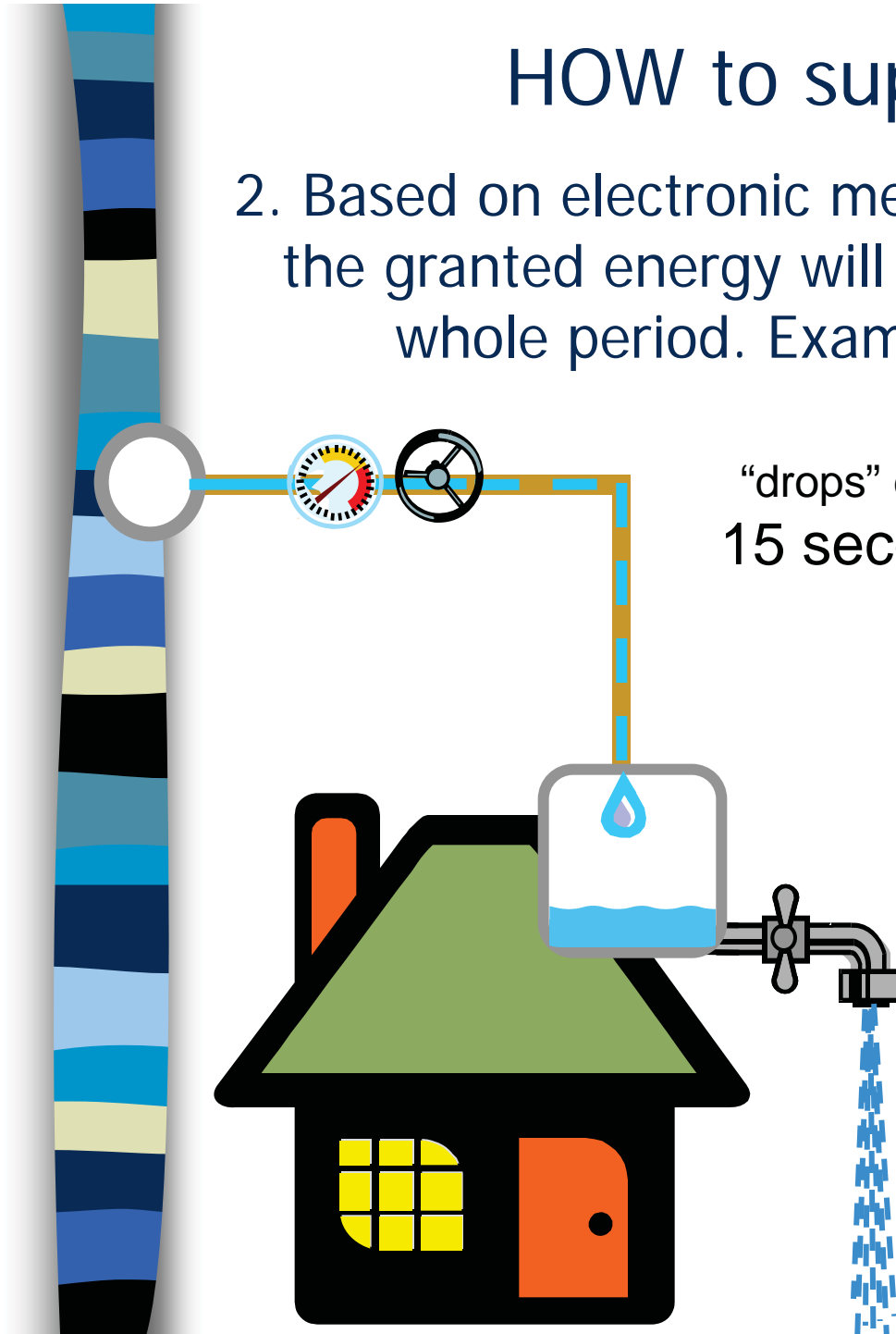
2. Based on electronic meters and by “dropping”, assure the granted energy will provide basic needs over the whole period. Example for 150 kWh/month:

“drops” every
15 seconds



Every “drop” could weight
0.000870 kWh
for 150 kWh/month

0,00348	kWh per minute
0,2088	kWh per hour
5	kWh per day
150	kWh per month



HOW to supply – Proposal:

3. Over the granted energy, extra energy could be purchased under worldwide well known cell-phone-like PREPAYMENT, at full tariff:

Anticipated purchase of energy



★ *Purchase*



Transfer of the credit to the energy meter



★ *Charge*



Use of the resource until the credit expires



★ *Use*

★ *Purchase*



★ *Charge*



★ *Use*



HOW to supply – Proposal:

4. Under strong correlation with the amount of granted energy, the described scheme should allow reduced non-payment and Anti-theft distribution costs, and partially allocate Surveillance on the community.





Possible Additional Measures

If necessary, consider overcharging DISTCO's Utilities
Billing according to their non-technical losses.

This could encourage regularization.

Example:

Price increase for losses exceeding DISTCO parameter:

If losses percentage is below than 20% 60%

If losses percentage is between 20% and 25%..... 80%

If losses percentage is more than 25% 100%

View of a case in Argentina:

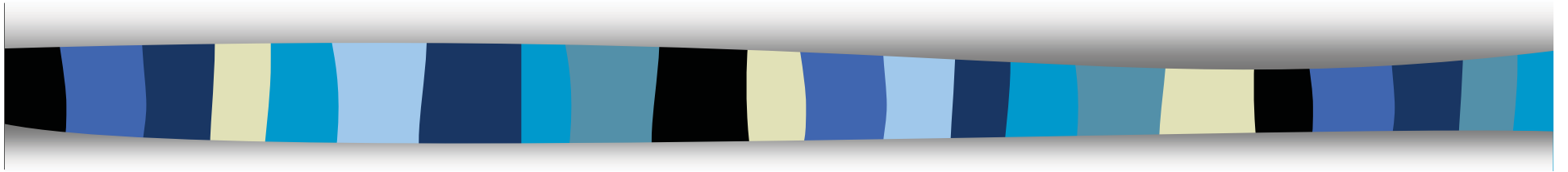
Agente	Mayores MWh	Valoriz.Perd PESOS	Perd.Mensuales PESOS	\$PTESTNS \$/MWh
DPCORRWD	42 473,969	8 740 112	782 222	298,92
EDECATKD	13 947,409	2 524 820	167 354	300,84



Urban poor electricity access Sustainability conditions

- Community support for granted, high quality energy
- Local political support
- Subsidied Users Database: properly build and maintained
- Clear role definition: distco, government, user.
- Occupied lands: Distco supplies from outside. Cooperatives in?
- Optimized interaction between energy vectors (ie:Electricity–LPG)
- Energy theft in the community not possible
- System allows going gradually out the granted scheme.
- Transparent, auditable.

Thank you ...



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