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METERING INVESTMENT OPTIONS REQUIRES BALANCE

Harold Hayes
Technologist
Harold.Hayes@landisgyr.com

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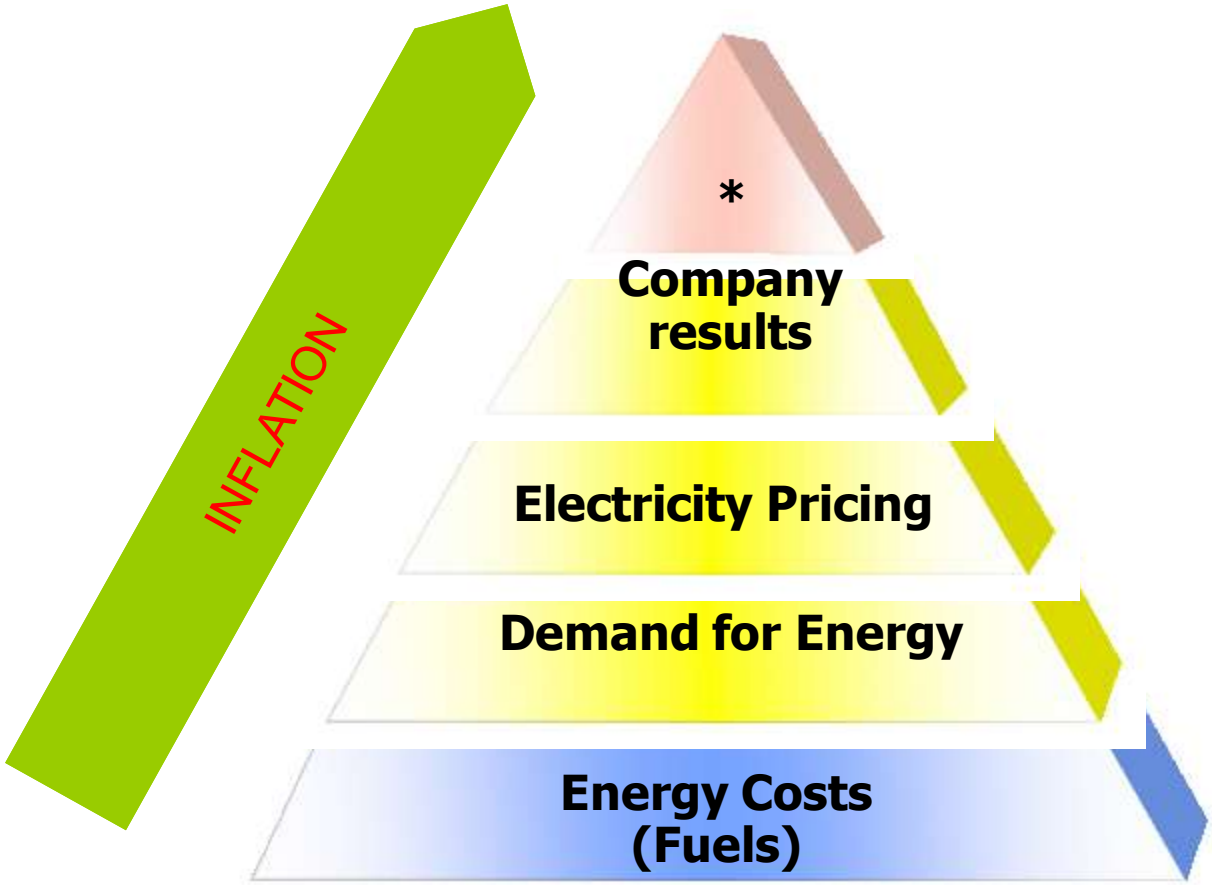
THE POWER INSTITUTE FOR EAST & SOUTHERN AFRICA

RESIDENTIAL METERING INVESTMENT

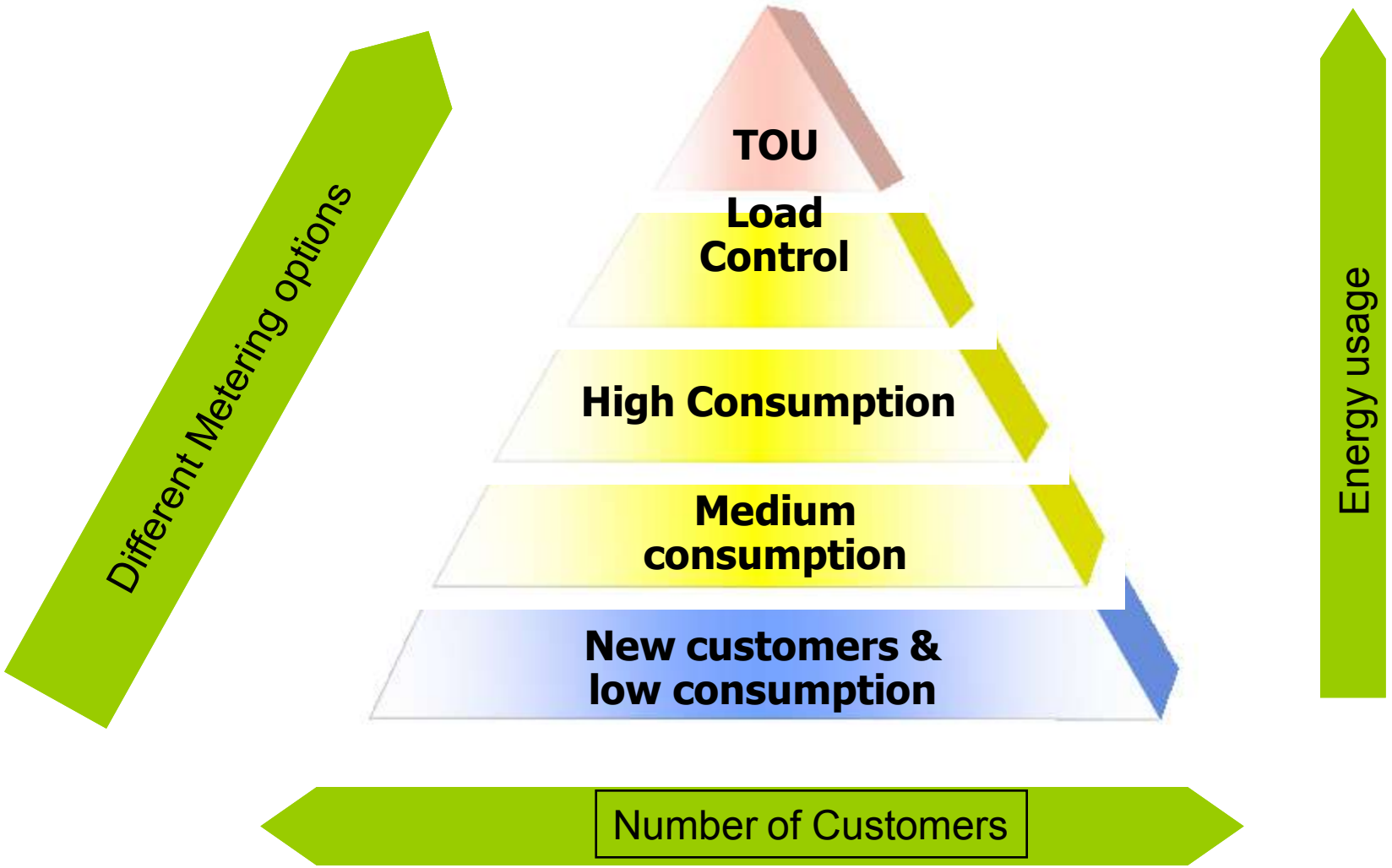
Many utilities will invest millions and millions in various residential metering technologies over time, the questions that should addressed is;

- **Identify the problem**
  - None payment
  - Non technical losses
  - Late payments
  - Cost of disconnection and reconnection
  - Requirement for Time Of Use (TOU)
  - Requirement for Demand Side Management (DSM)
  - Legislation change
  - Etc.
- **Investment questions**
  - What is the pay back period and is this sustainable?
  - OPEN STANDARDS!!!!!!!!!!!
  - How will the solution solve the problem?
  - Implementation period?
  - Utility Resources?
  - Will TOU solve the problem, can the customer change load patterns?
  - DSM, what load can shed?

INCREASED DEMAND ON DELIVERY



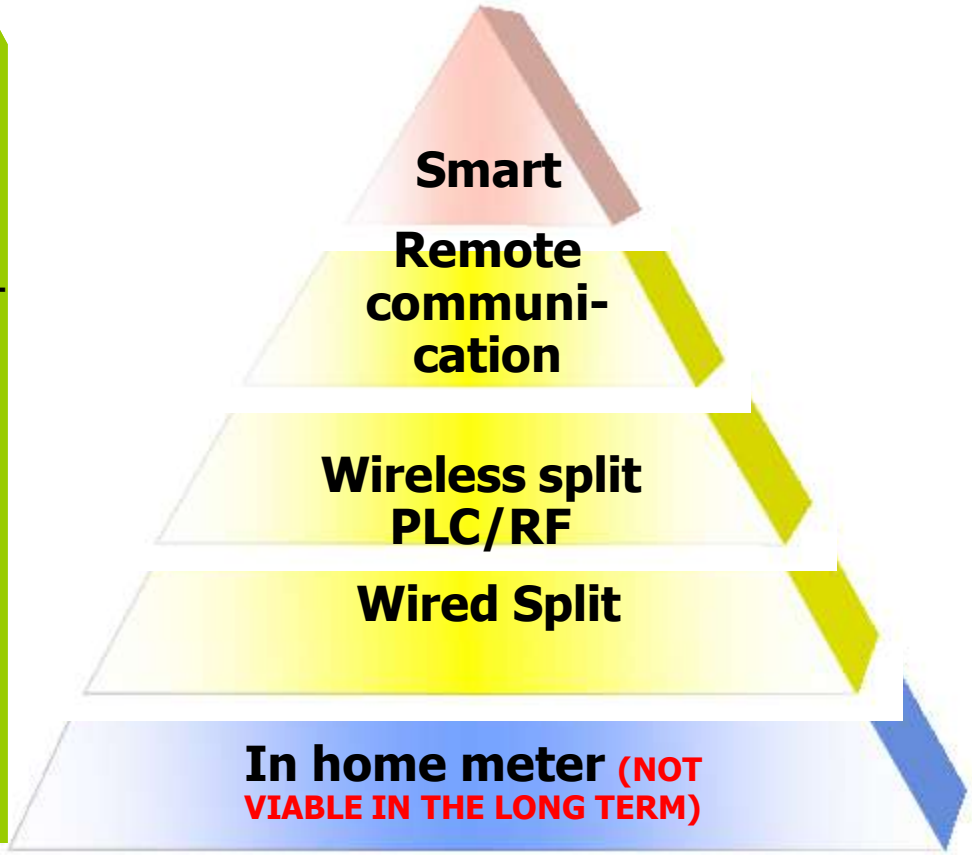
Residential Customer Base



Various investment options

Increased Revenue

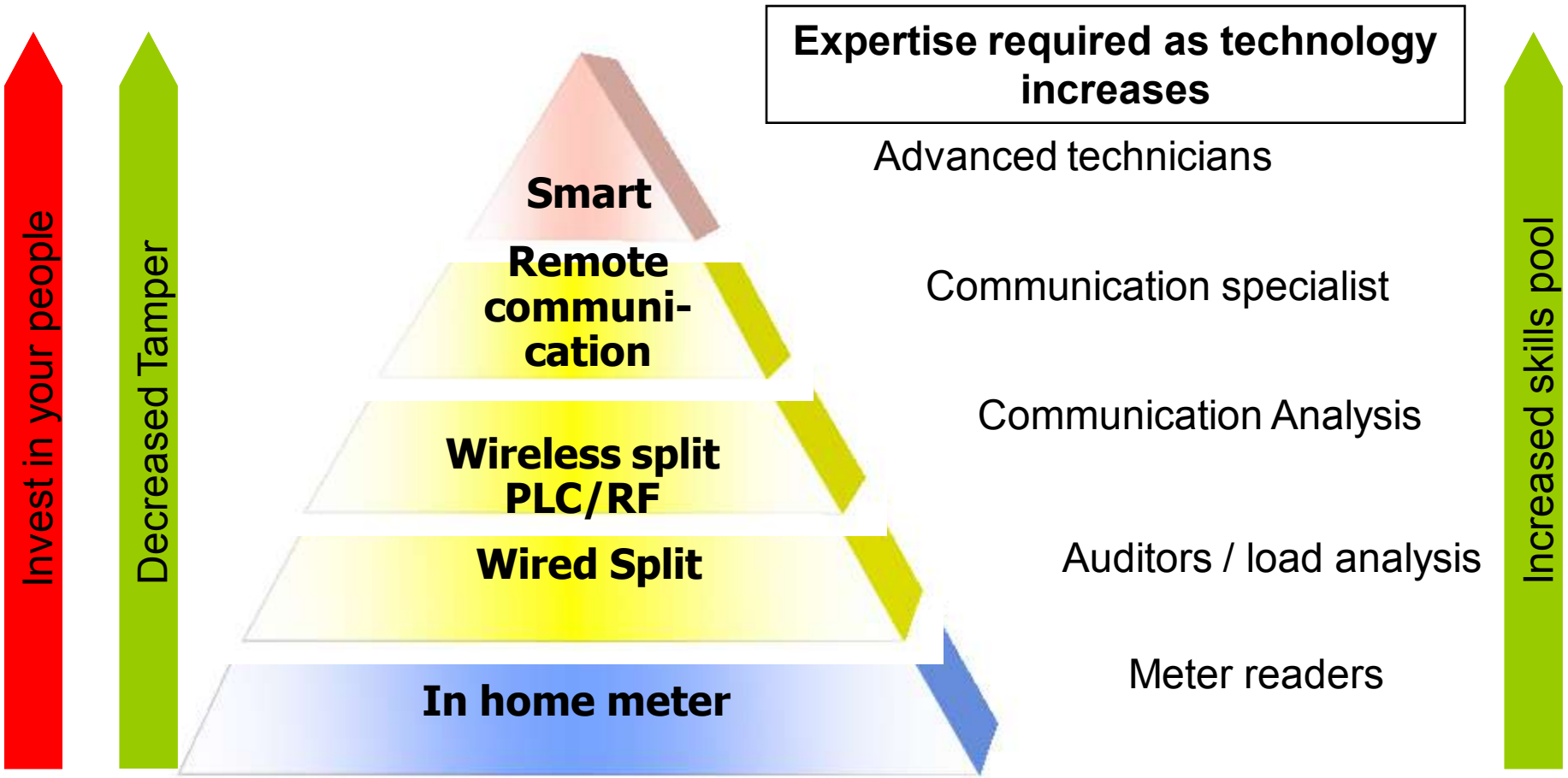
Decreased Tamper



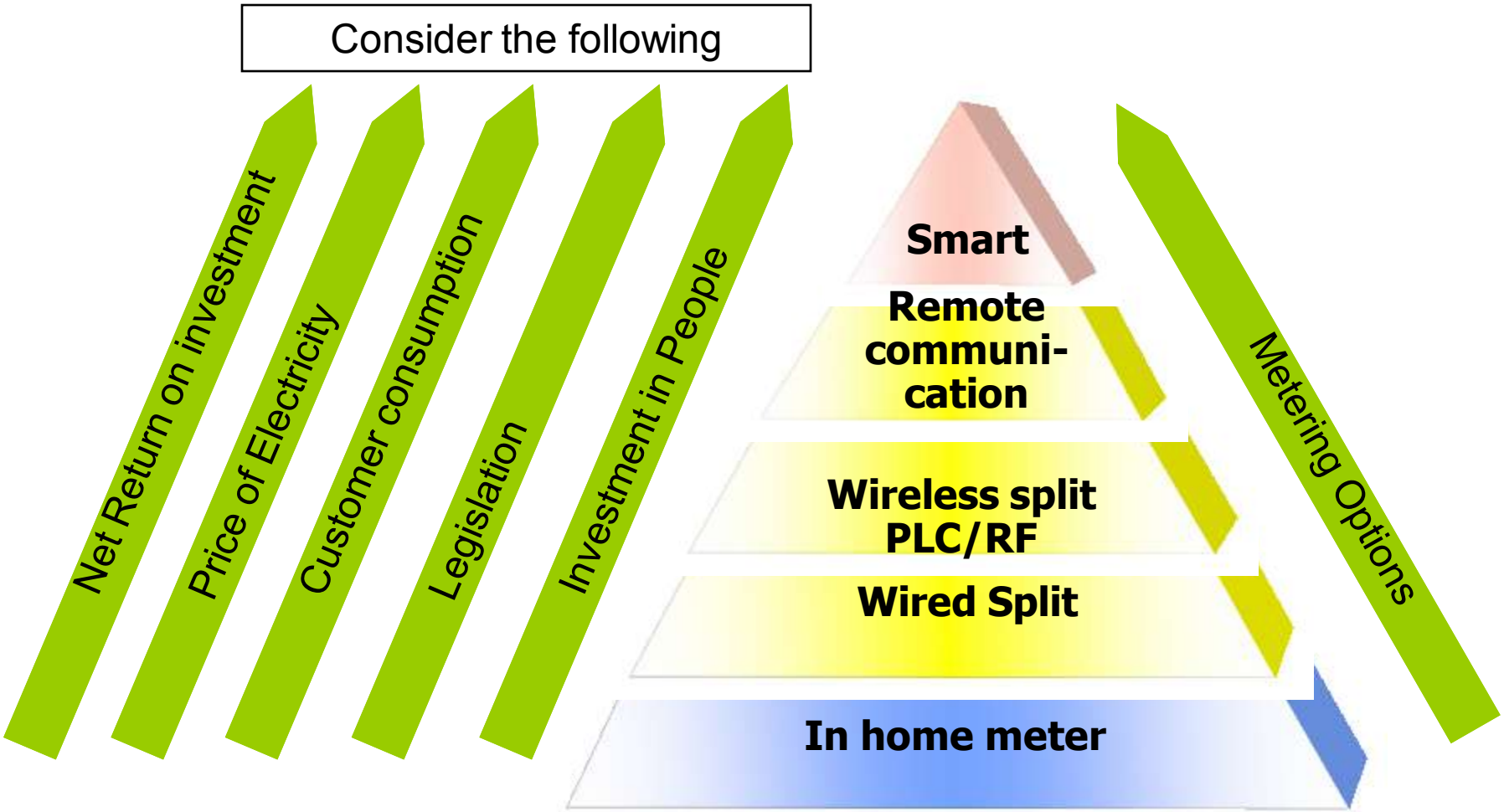
Cost per end point
13 x Mechanical cost
10 x Mechanical cost
8 x Mechanical cost
4 x Mechanical cost
2 x Mechanical cost
Basic Mechanical meter

Increased cost

Human Resources

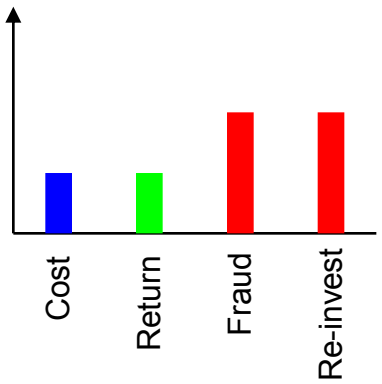


BALANCE INVESTMENT VERSE RETURN



STAND ALONE METERING

Investing in the In-Home Meter



- Low investment
- Low Return
- High Fraud
- Re-invested
- Low Complexity

In-home BS meter

In-home common base meter

Background Mature prepayment problem site

- Initiative originated from research into the high number of transformer failures.

- The root cause of the failures was attributed to the theft of electricity, meter bypassing contributed significantly to the overloading problem.

- Findings revealed that bypassing of meters constituted near 60% and illegal connections 5%.

Examples of tampered meters

Site upgraded to Split metering

- **Theft was as high as 60% dropped to near 5% on implementation of the split metering technology.**

- **Theft on ABC can be easily identified & eradicated.**

- **Theft has moved from behind closed doors, thus exposing perpetrators.**

- **Split metering technology proposed for all future installations.**

Prepayment meters installed in the Home

- Do not change the processes adopted for simple credit metering
- Continue to read meters on a monthly bases, input these readings into the prepayment or billing system
- Meter readers to be trained as auditors
- Statistical meters should be installed

This will assist in reducing losses with low investment!

Simple Example given, Why change to Split

- **Assume 1000 customers using an average of R100 per month.**

	Usual Prepaid	Split metering
Prospective Return	**R100 000**	**R100 000**
Revenue Loss due to theft	**R60 000**	**R5 000**
Actual Return	**R40 000**	**R95 000**
Cost of the meter	**R 250**	**R 400**

Pay back will be less than three months

Split Metering offers a substantial return vs. in-home meters.

More then R55 000 return per month. (verse the losses in the area)

SPLIT METERING

Various Split options

Single Phase Split Meters — **Customers based on consumption**

INCREASED CASH FLOW

Metering Solutions

High income
Large consumption
High security area
Fast installation
PLC/RF _ No Comms wire
Optional AMR

PLC

High Power Consumption

Meter replacement
Wired comms
BS Foot print
With Customer interface

Meter replacements

Medium Power Consumption

New & Mass Installations
Wired Comms
Din Rail
Optional AMR

DIN Rail

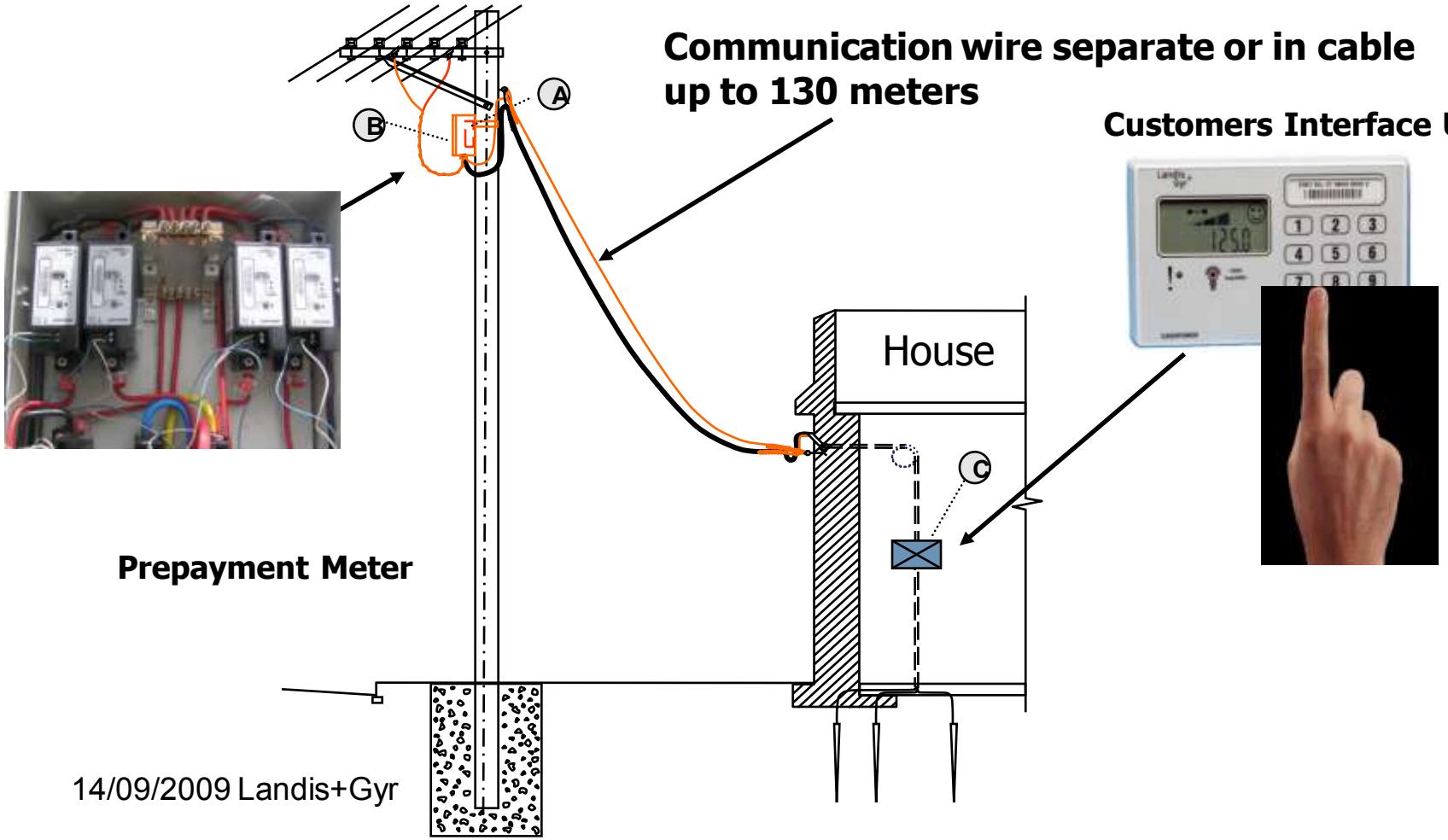
Low Power Consumption

Metering problems

Meter readings
No Trust
Fraud
Difficult installations
Multi level buildings
Tampering
Theft
Late Payments
Cost of disconnect
Non Payment
High Debt
Access to meters

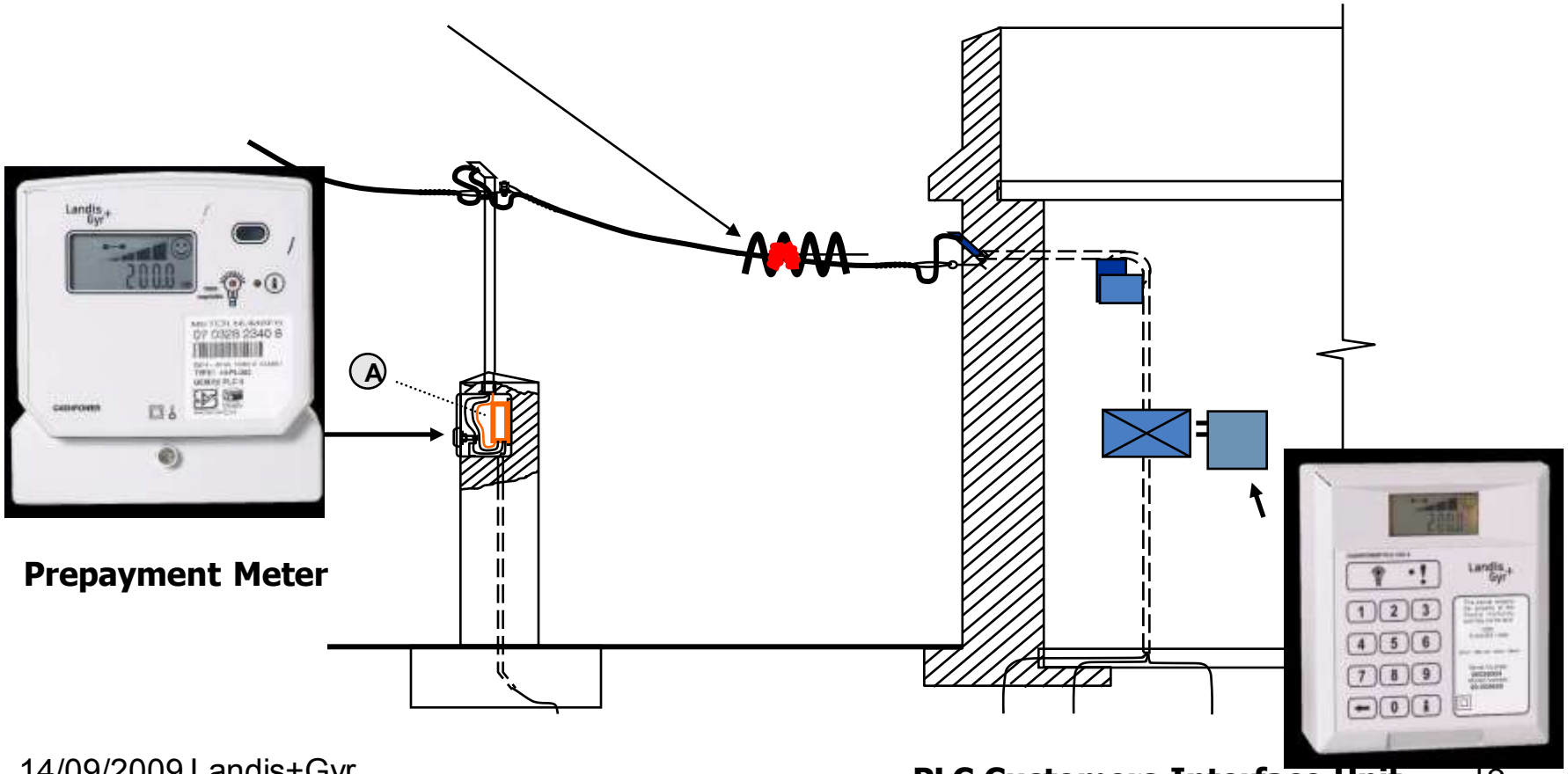
Volume

Split Meter (wired) Typical Installation



Typical Installation: PLC Split Meter

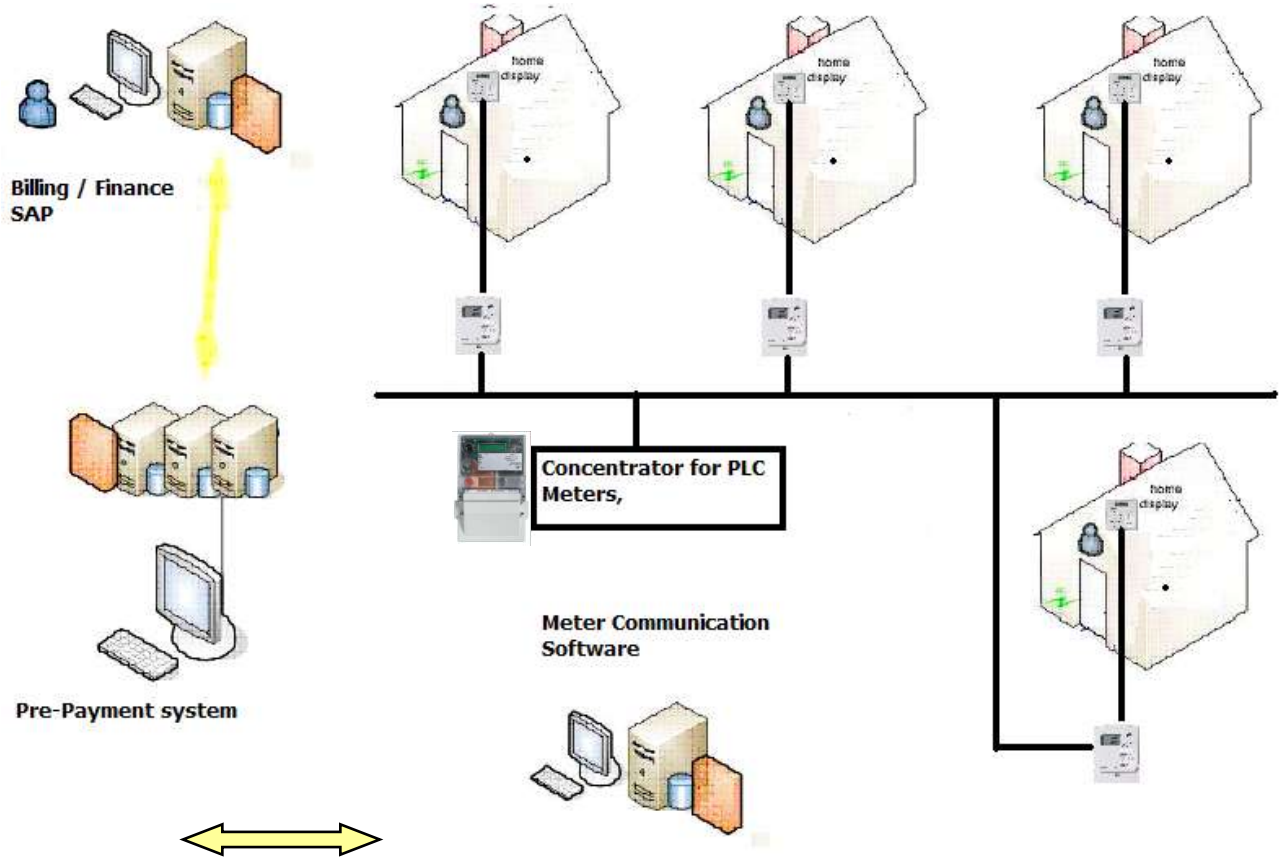
No Communication wires required



Prepayment Meter

PLC Customers Interface Unit

PREPAYMENT MOVING TO SMART
e.g. PREPAYMENT PLC



SMART METERING

Trends in Smart meters

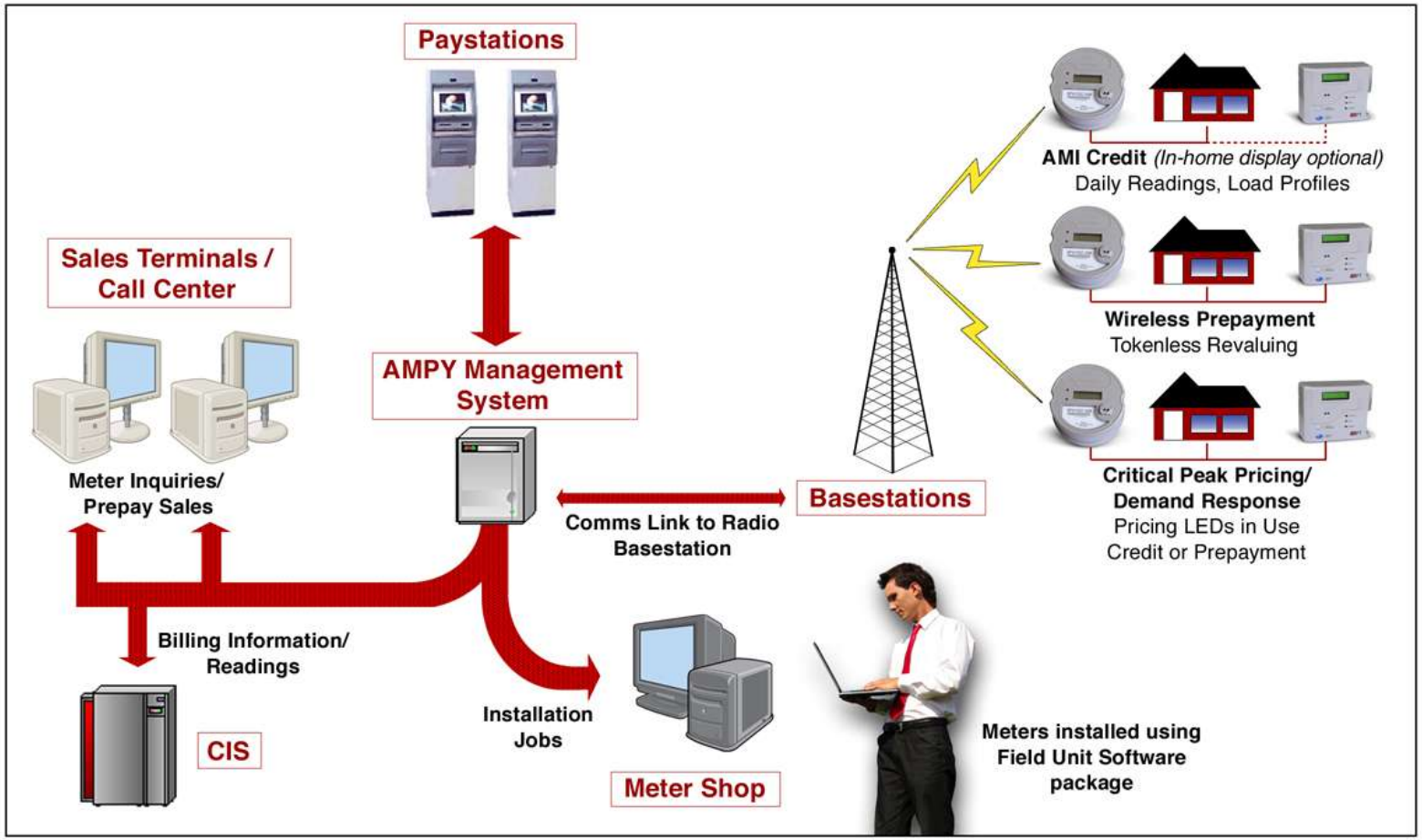
Required AMI Functionality for residential smart meters
Metering Unit (Not in any particular order)
• TOU
• Load Profile (30 Minute data)
• Prepayment (option)
• DSM (40 Amp load to be switched) based on time switch
• Real time DSM switching (40 Amp load to be switched)
• remote meter programming
• Remote disconnect (cater for essential electricity users)
• Remote connect
• Multi Energy (Water and Gas)
• Quality of supply

Trends in Last Mile Communication

Communication and other requests
• GPRS (Australia no GPRS after 2012)
• SMS
• PLC
• DLC
• Broad Band PLC
• Drive By meter reading (Open Frequencies)
• Wire less Ethernet
• Radio
• Radio Mesh (Euro frequency Band)

Smart Radio Solutions

Be very aware of the frequency allocation in your country
Most radio systems in Africa will only work on line of site



Smart Meter Solution Overview

UTILITY

aim

DEMAND RESPONSE

CUSTOMER

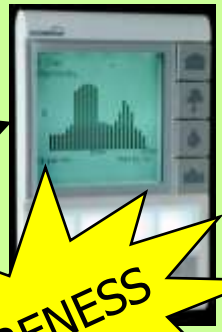
concentrator

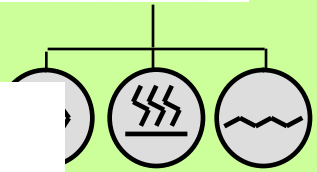
real-time data

RF, PLC

RF

AWARENESS

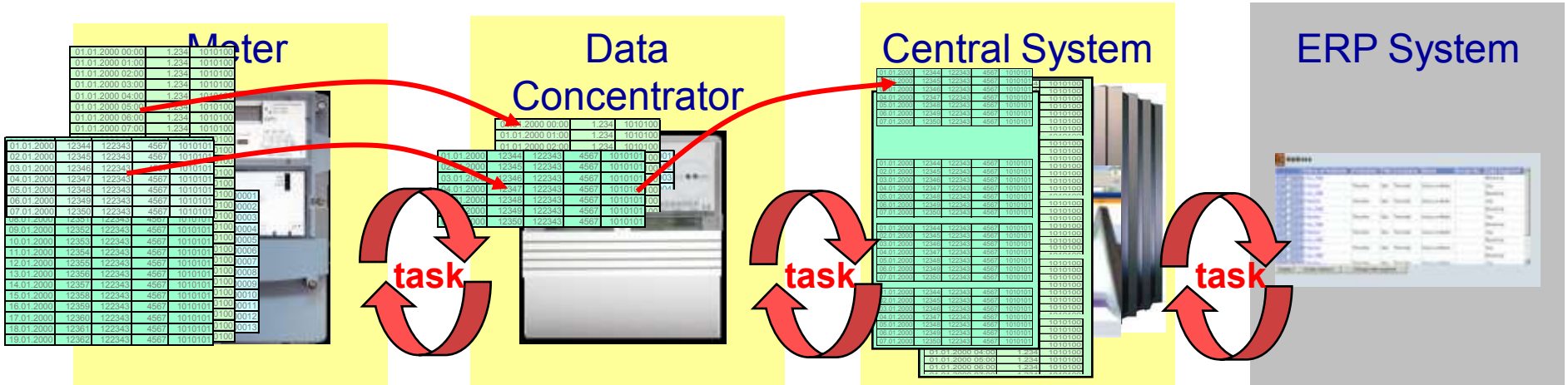




Internet

historical data

Maximum End to End Reliability: Redundant Data



PLC **GPRS/GSM** **LAN**

Daily Values (1 year)	Daily Values (6 days)	Daily Values (> 1 year)	Daily values
Hourly Values (90 days)	Hourly Values (6 days)	Hourly Values (> 1 year)	Hourly Values
Event Log (100 entries)	Event Log	Event Log (> 1 year)	Event Log

yr

CONCLUSION BALANCE THE INVESTMENT WITH RETURN