AMI in South Africa

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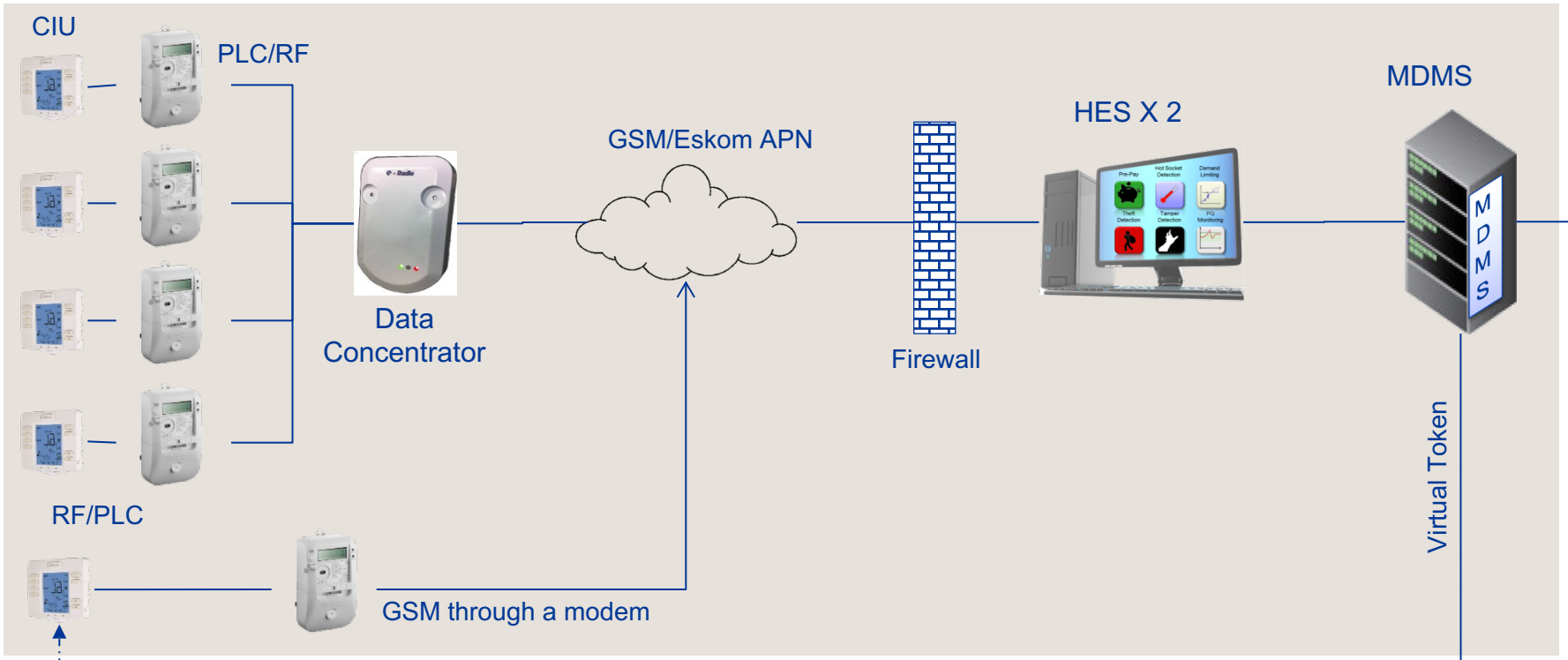
Contents

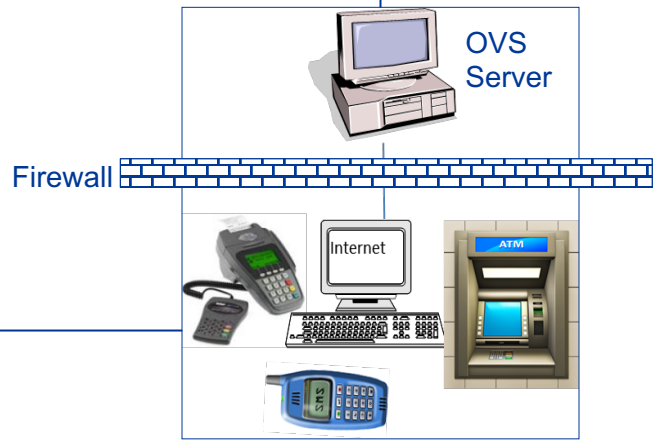
- Overview of AMI
- Status of AMI South Africa
- Progress on SA standards and beefing up current standards
- Realizing true value of current AMI investment using MDMS

AMI System Architecture - Overview

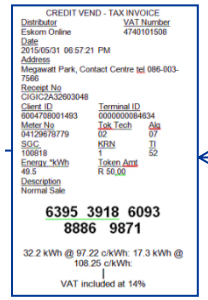


Other legacy systems

- Outage Management
- Work Management
- CC& Billing
- Mobile Platform
- CRM
- Etc.
- N



STS Token



Manual Entry of STS Tokens into meter via CIU

Status of AMI in South Africa

- Utilities in SA have started installing smart meters sporadically, no large-scale roll outs yet.
- There is no national plan to roll out smart meters in the country
- Limited funds available to roll out AMI
- Current installed AMI largely based on proprietary products
- Standards needs to be firmed up and finalized (NRS049).
- AMI value not realized, Limited data analytics, No MDMS
- Perception that smart meters are expensive
- Data costs still high - impact on operational costs in the long term
- Lack of AMI skill nationally
- Smart Meters designated by DTI – 50% local content
  - Few manufacturing facilities in the country

Firming up of AMI standards

NRS049 Enhancements

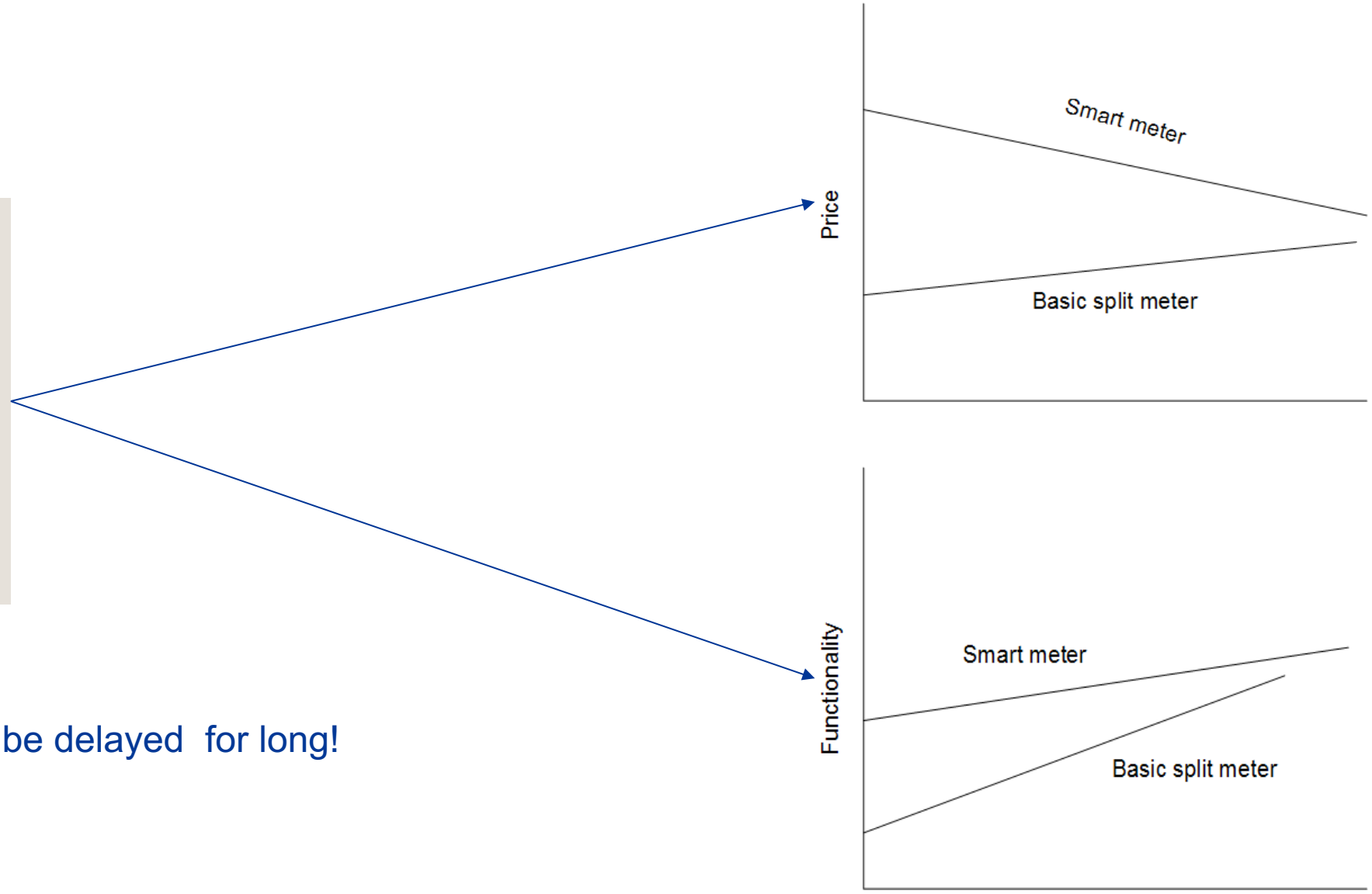
- NRS 049 down into the following parts to make it easier to read, reference and use.
  - Part 1: Smart Metering Framework – Draft completed
  - Part 2: Requirements for Smart Meters – Draft completed
  - Part 3: Functional requirements for head-end systems – Draft in progress
  - Part 4: Requirements for Auxiliary equipment (kiosk controllers, ACDs, water & gas meters) – Draft in progress
  - Part 5: Companion Specification – Draft in progress – (Firmware upgrade on meters)

MDMS requirements not included!

Metering technology developments

Energy Space

- Digitization
- Smart grids
- Distributed generation
- Smart Cities
- 4IR - Big data
- Decarbonization
- Globalization

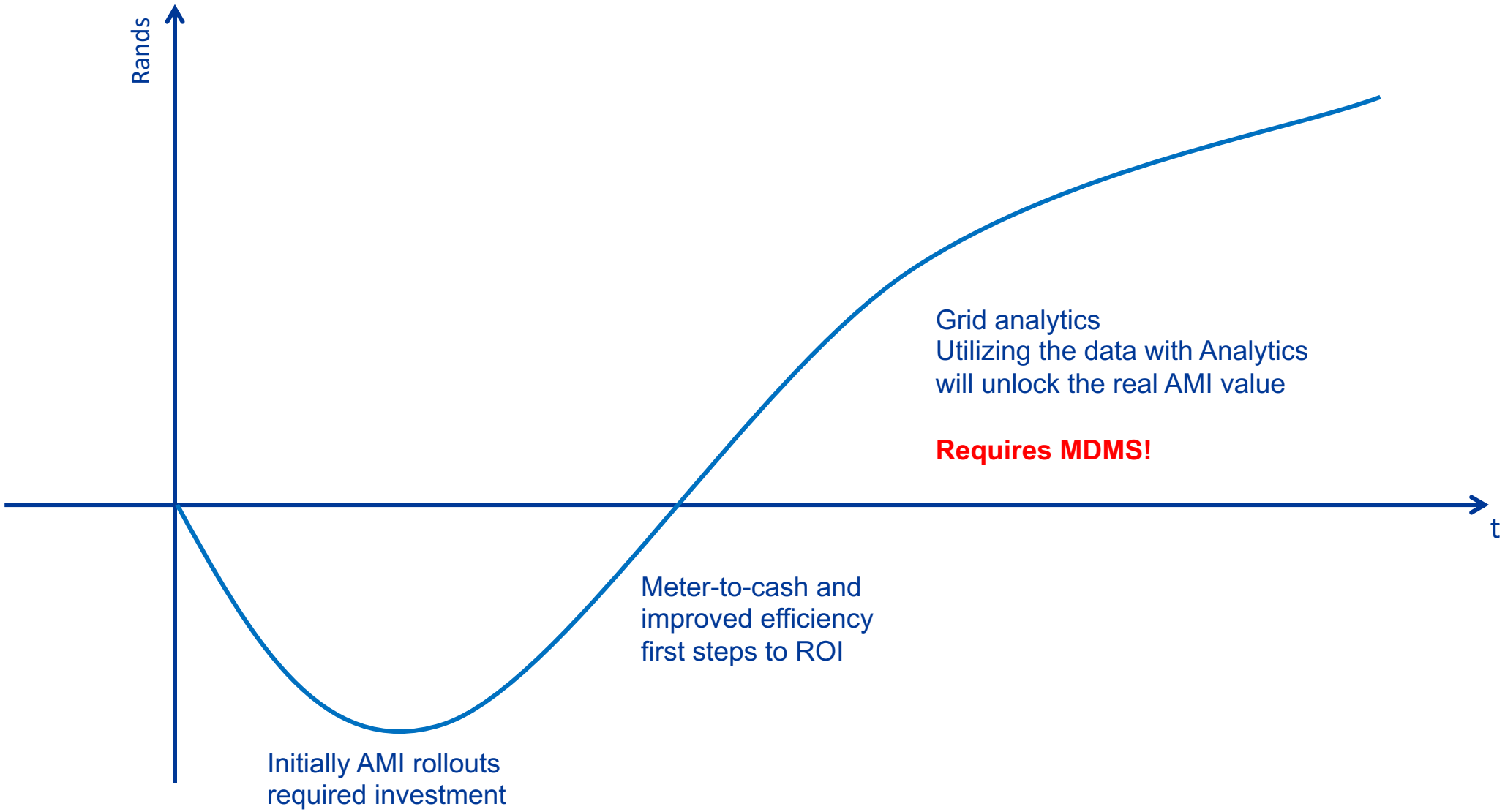


Smart meters cannot be delayed for long!

Why are we not reaping benefits from installed AMI

- Proprietary and unproven products installed
- Organizational processes where not changed to align with AMI technologies
- Supporting organizational structures not changed to accommodate AMI
- Poor telecommunication network reliability
- Lack of skills
  - To operate the installed system
  - To analyze the collected data
- **MDMS was not implemented – collected data is not fully analyzed**
- Legacy systems cannot be integrated with new system - legacy systems just too old

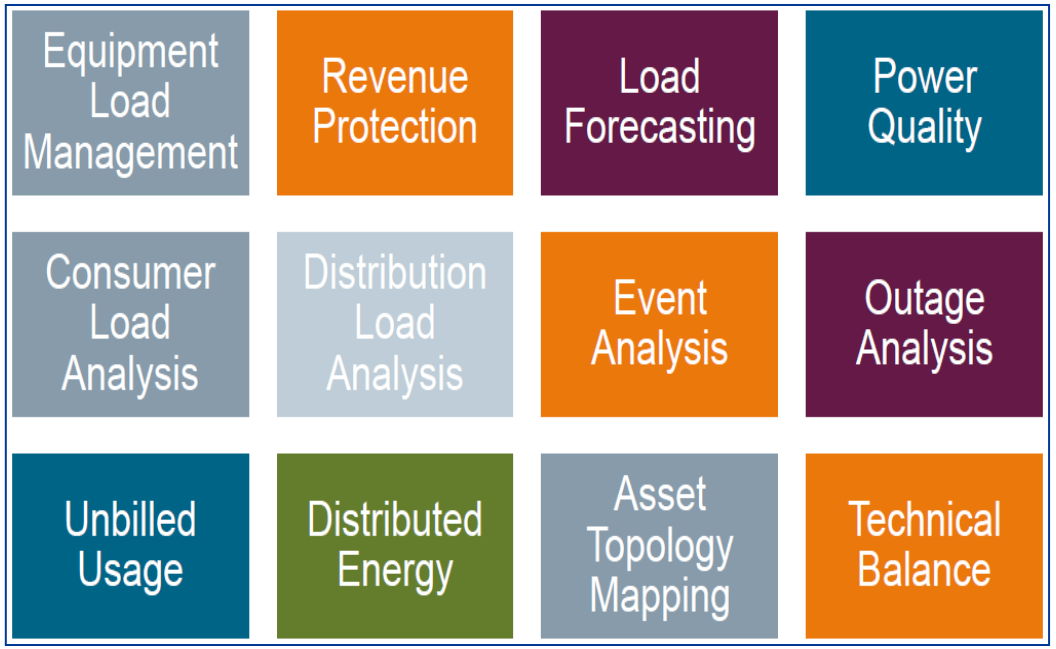
Unlocking the true value of AMI



Unlocking the true value of AMI using MDMS

- Ideally, this is the fist system to be installed when rolling out smart metering system
- Data repository for collected metering data
- Support smart metering uses cases
- It talks to the installed HES or HESs and other legacy systems
- Performs data analytics
- Built in intelligent for exception reporting purposes
  - Below average consumption report
  - Customers with high consumption that need to be upgraded
  - quality of supply
  - Etc.
- Ideally one MDMS per utility
- Consideration should be given for some SA Municipalities to share one MDMS

Typical MDMS Dashbord



Its all about big data

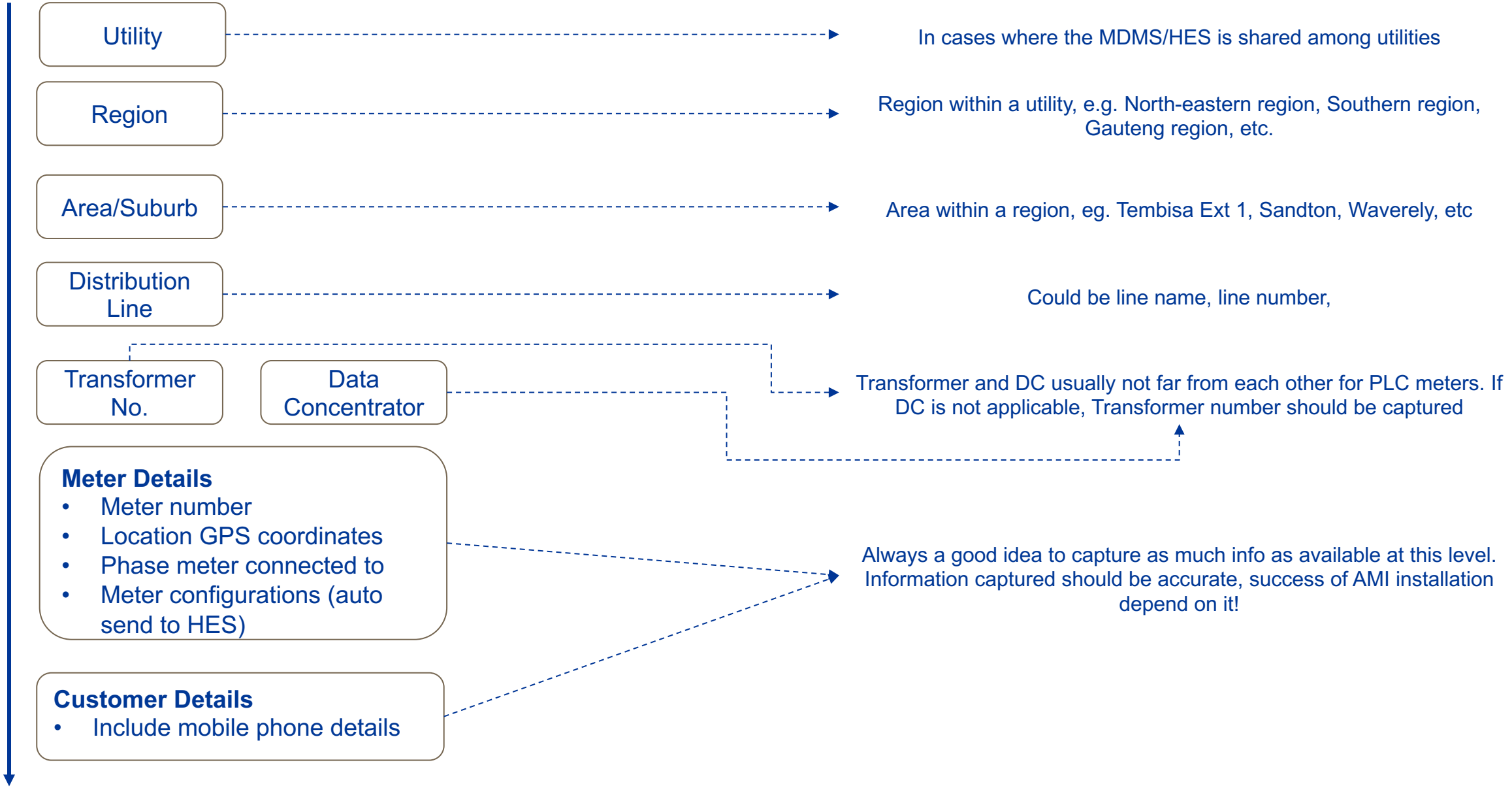
Without MDMS, true value of AMI investment cannot be unlocked!

Some use Cases that leverage AMI investment

Remote meter reads & Configurations	Accurate meter reads (monthly or on demand), remote meter configuration & interrogation
Consumer Load	Weekday versus weekend, comparison by customer class, meter type
Distribution Load	System wide load, load at a distribution transformer or circuit
Outage and Visibility	Outage incidents by distribution grid topology and geography, LV network visibility
Events	Events by meter type, event trend over time
AMI Performance	Trend of reads expected, missing or exempted

- The benefits of these use cases to a utility cannot be realized without MDMS
- MDMS is therefore key in ensuring the realization of the full value of the AMI systems
- The Head end System alone is not good enough

Unlocking the true value - Data capturing during installation



Considerations when operationalizing smart meters

- Operational costs
    - Telecommunication costs
    - License fees for systems and support & maintenance contracts
- Must cater for DC when smart meter are installed.
- Guarantees for field equipment (DC, Meters and CIU)
- Firmware upgrades for field devices in the field (free or at a cost?)
- Data Storage costs
- Hardware upgrades

- Water-tight contracts
- Nourish established relationships with suppliers

Urgent considerations for South Africa

- Complete NRS 049 and make it the de' facto standard for smart metering systems in South Africa
  - Include the companion specification
- User Requirements Specification for the Meter Data Management System
- Compile a South African Code of Practice for Smart Metering Systems
- Compliance Test Specifications for NRS049
- Establish a South African test house for DLMS/COSEM compliance
- Ensure that several municipalities share one MDMS
- Develop accreditable AMI training
- Ensure meters are future proofed i.e. removable comms module, open protocols and standards, interoperable & interchangeable
- Critical to offer interoperability and interfaces between standards (i.e. OSGP, DLMS, and CIM, Meters and More, etc.).
- Critical to consider the continuing evolution of communication technologies - ability to mix and match various technologies, with different protocols.