Future Strategy for the Implementation of Smart Metering with Ripple Control

by Reinhard Dettmar, Elster Messtechnik, Germany
Ian Robinson, Robmet Meters, Johannesburg
GOVERNMENT LEGISLATION

• Notice R.773 stipulates:

“A licensee should install a facility to remotely control the supply of electricity to any electric geyser that does not incorporate a solar water heating facility…. by 1st January 2012”
• Notice R.773 also stipulates:

“an end user or customer with a monthly consumption of 1000kWh and above must have a smart system and be on a time of use tariff not later than 1\textsuperscript{st} January 2012”
• According to latest NERSA statistics, there are approximately 7.5 million domestic customers
• Approximately 3.6 million of these are ESKOM customers
• Average consumption per customer = 205 kWh per month
• Unlikely that many of these have electric geysers, therefore not affected by R.773
STATISTICS (2)

- Approximately 3.9 million of these customers are Municipal customers
- Average consumption per customer = 603kWh per month
- Likely that most of these have electric geysers, but average consumption below 1000kWh per month
STATISTICS (3)

- Statistics difficult to obtain, but probably only 30% of these customers consume over 1000kWh per month
- This means only around 1,2 million customers need to be fitted with a smart meter
- However, this leaves 2.7 million customers who need to be fitted with a remote control device for their geyser
SMART METERS - COST

• Current cost around R 5 000 per installation including support systems and radio links for control of geysers

• Cost of fitting 1,2 million customers with smart meters = R 6 billion

• Who pays for smart meters?

• No money in ESKOM’s DSM fund
SMART METERS - TECHNOLOGY (1)

- New technology
- No standardisation on communication technology
- No standardisation on communication protocols
- Many competing technologies
SMART METERS - TECHNOLOGY (2)

- Slow response time – OK for meter reading but not for dynamic load control
- Reliant on 3rd party suppliers
- Still need to carry out product evaluation and field trials, so extended delivery period
MODERN RIPPLE CONTROL SYSTEMS (1)

• Use HV injection (up to 150kV) so can cover larger areas from only one injection point
• Based on proven technology and reliability
• Large number of receiver addressing capabilities so can split load into smaller groups for better control
MODERN RIPPLE CONTROL SYSTEMS (2)

- Designed for dynamic load control
- Emergency shed capability of less than 10 seconds
- Open protocols
- Receivers microprocessor-based so fully programmable
- Suitable for controlling TOU meters
MODERN RIPPLE CONTROL SYSTEMS (3)

- Fully under the control of the Municipality - no 3rd parties involved
- Low capital and running costs
- Small receiver size - can be mounted in DB board
- Well-known technology in South Africa
- Fast delivery: receivers within 2 months
PROPOSED SOLUTION

• Hybrid system using ripple control for direct control of geysers, and TOU smart meters
• Meters provided with space for future plug-in communication module (GPRS, PLC, RF)
• Read meters initially using existing meter readers with Hand Held Units (HHUs) fitted with optical probes
ADVANTAGES OF HYBRID SOLUTION (1)

- Uses proven technology
- Low cost solution for geyser control
- Low cost solution for control of smart meters
- Same functionality as for an AMI smart meter
- Makes use of existing ripple control systems
ADVANTAGES OF HYBRID SOLUTION (2)

- Allows time for communication methods and protocols to mature
- Avoids stranded assets
- Complies fully with R.773 for control of geysers
- Complies fully with R.773 for smart meters when communication module added in future
AS2XX SMART METER FOR HYBRID COMMUNICATION

- Basic features of the meter
  - Advanced metering
  - Pluggable Comm. Modules
  - Integrated Disconnection Unit
  - Load Limitation
  - Consumer display with remote access
  - TOU Management
  - Tampering functions
  - Wired & Wireless M-bus Interface
Thank you