



Electricity Efficient Usage

The role of the utilities, regulation entities and metering process

August 24th, 2006

Eficientização do uso da energia elétrica - O papel das concessionárias, dos entes reguladores e do processo de medição

This Presentation:

- **Strategic Approach for Electricity Efficient Usage**
- **Traditional Metering Process**
- **Strategic Approach with the Stakeholders**
- **Audiences' Strategic Approach**
- **Utilities Benefits**
- **Picking Targets and Prioritizing**
- **Conclusions**

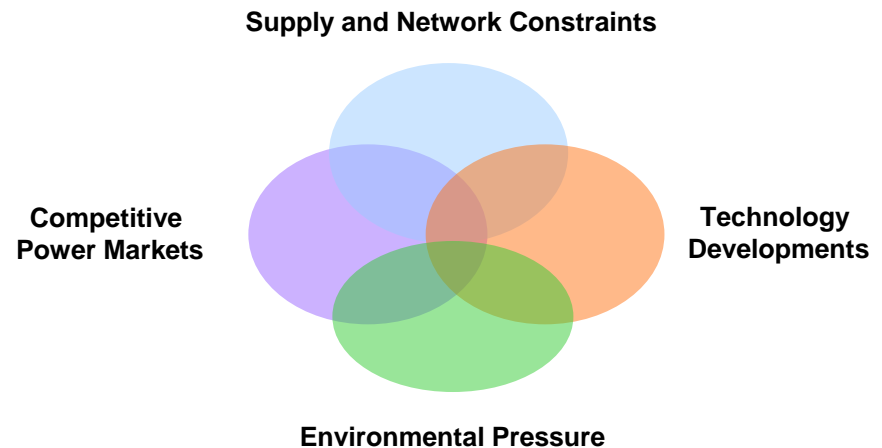
Strategic Approach for Electricity Efficient Usage

What is it?

A multi-layered strategic approach that targets all the players that influence the energy markets

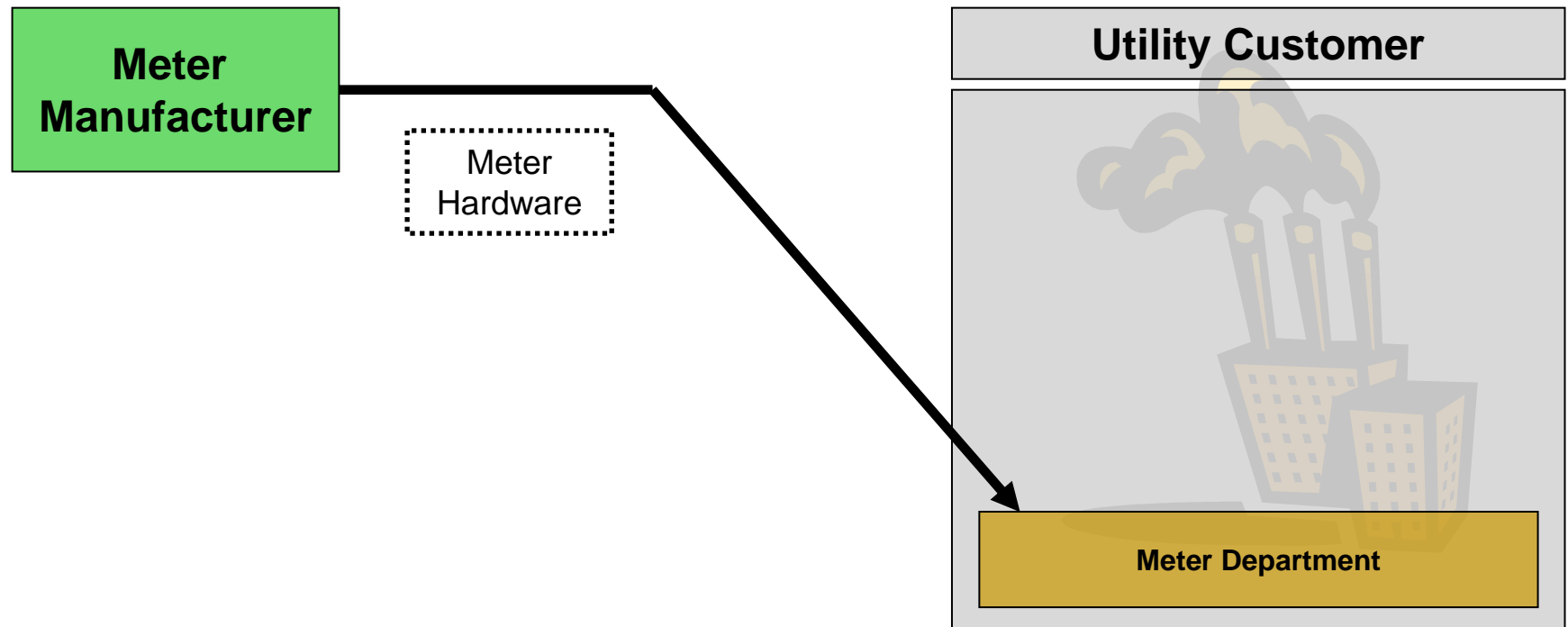
Why do it?

- **Advanced metering product benefits cut across the customer's operating areas** – the decision to use it goes well beyond the metering department
- Depreciation – Smaller depreciation period should be considered, as to meet standard life time for electronic products according to local regulations
- **Energy markets have changed and are strongly influenced by outside forces** – liberalized markets mean our utility customers may be 'at risk' for metering investments or may have more elaborate regulatory processes to get metering infrastructure into the regulated asset base
- With advanced metering the **product mix is new and more complex**
- The **price-tag** of an AM system is higher – decisions are made higher up within the utilities and as part of broader strategic context



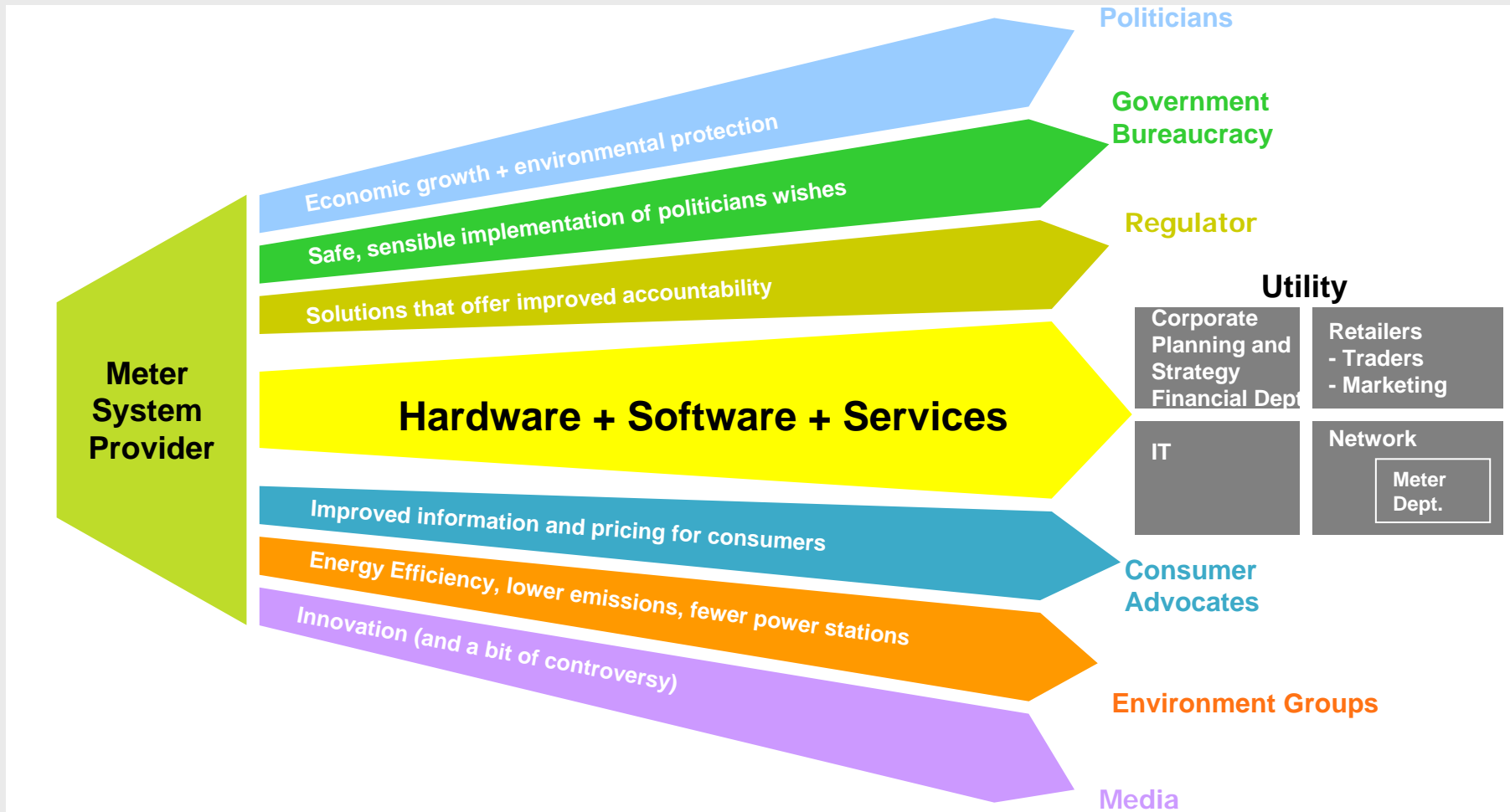
Advanced metering cuts across responsibility areas within utilities: networks, retailing, metering, IT, trading, environment, safety, planning, financial department (depreciation)

Traditional Metering Process



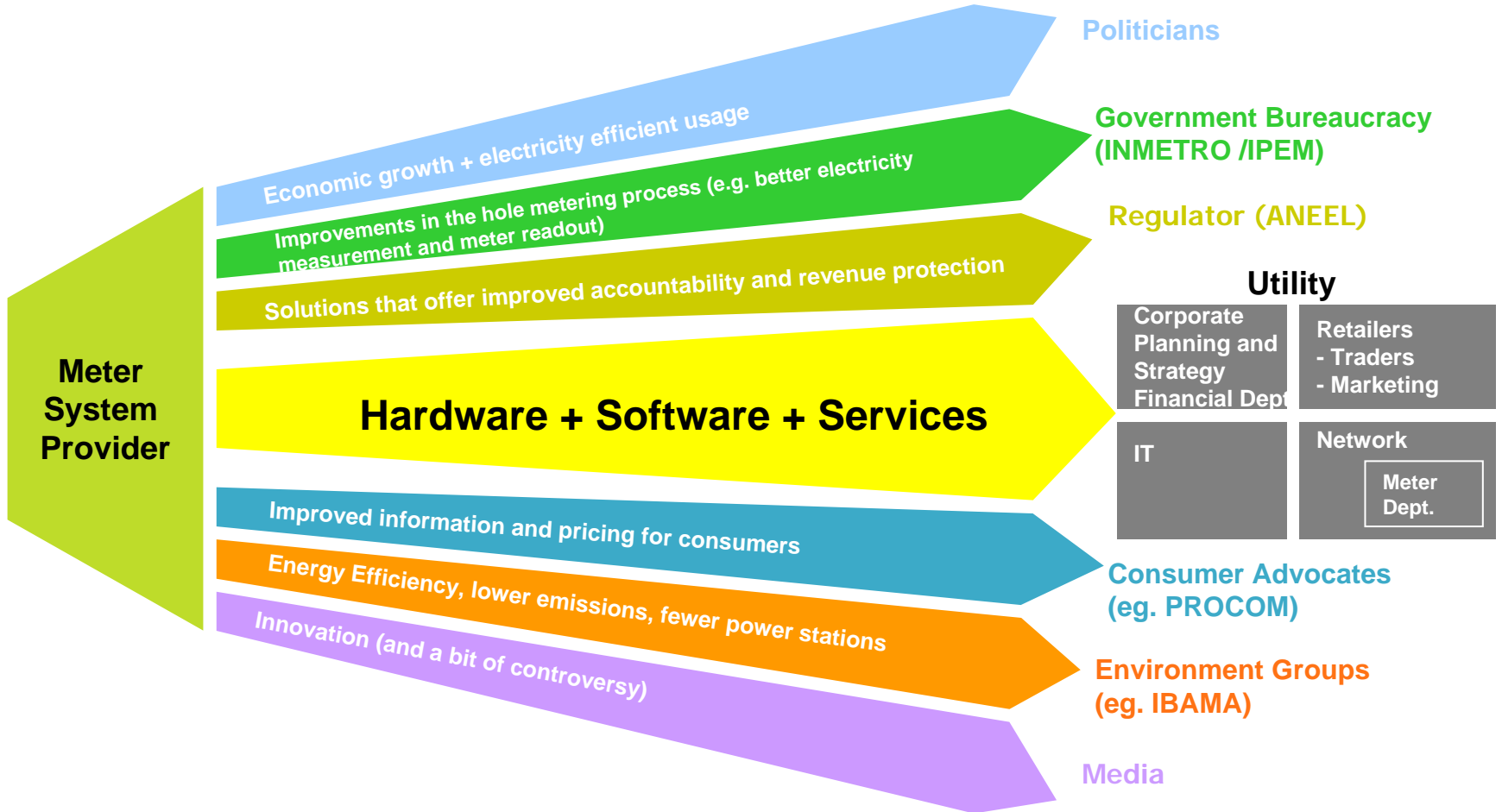
Strategic Approach with the Stakeholders

Worldwide Experience



Strategic Approach with the Stakeholders

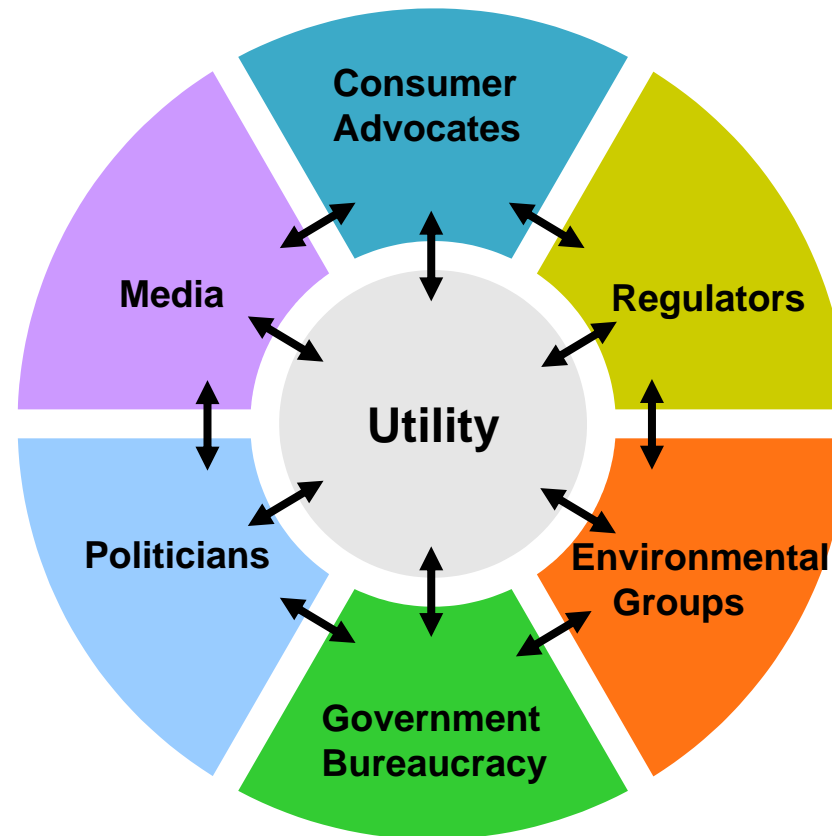
Brazilian Experience



Audiences' Strategic Approach

Target Audience	Key Message(s)
Utility (meter department and beyond)	<ul style="list-style-type: none"> - Improvements in the whole metering process - Regulatory compliance - Competitive advantage
Regulator (ANEEL)	Solutions that offer improved accountability and revenue protection
Government bureaucracy (INMETRO/IPEM)	Improvements in the whole metering process
Politicians	Economic Growth + Electricity efficient usage, where applicable
Consumer advocates (eg. PROCOM)	Improved information and pricing for consumers
Environment groups (eg. IBAMA)	Energy efficiency, lower pollution/emissions, fewer new power stations
Media	Innovation, environment (and a bit of controversy)

Audiences' Strategic Approach



Utilities Benefits

How the investments to improve the metering process can help the energy efficient usage

Network Benefits

BENEFIT CATEGORY	DESCRIPTION
Demand Management	<ul style="list-style-type: none"> Deferred investment in network system reinforcement (Capex) Targeted direct load control to avoid catastrophic outages (revenue assurance)
Metering	<ul style="list-style-type: none"> Automated meter reading (labour cost savings) Avoided special reads (labour cost savings) Leverage planned maintenance and replacement (Capex)
Asset Management	<ul style="list-style-type: none"> Detailed monitoring of network loads at distribution transformer (subzone/sublevel) → deferred investment (Capex) Positive confirmation of undocumented meter points (revenue enhancement) Accurate line-loss map and condition monitoring → reduced O&M (labour cost savings)
Outage & Restoration	<ul style="list-style-type: none"> Avoided costs of mail-outs for scheduled outages (administrative and labour cost savings)
Field Work Management	<ul style="list-style-type: none"> Pinpoint line faults (labour cost savings and revenue enhancement) Avoid unnecessary call-outs (labour cost savings)
Tariff & Regulatory	<ul style="list-style-type: none"> Avoid incremental cost of load research (e.g. for tariff splits) (labour cost savings)

Retailer Benefits

BENEFIT CATEGORY	DESCRIPTION
Collections	<ul style="list-style-type: none"> Cash flow benefit of billing monthly compared to billing quarterly (working capital) Early disconnect if not paying (revenue assurance) Reduced invoice-to-pay time through automation (working capital)
Demand Management	<ul style="list-style-type: none"> Targeted retail curtailments to reduce power purchase costs (operating cost savings) More granular load information → reduce hedge cover on a targeted basis (reduced capital requirements)
Billing & Customer Care	<ul style="list-style-type: none"> Reduced complaints/queries re: estimated reads (labour cost savings) Reduced cost of reworked bills (labour cost savings)
Finance & Reporting	<ul style="list-style-type: none"> Avoided year-end accruals process (labour cost savings)
Environmental	<ul style="list-style-type: none"> Compliance with NGACS scheme (regulatory cost)

Societal Benefits (government/customers)

- Avoided generation
- Reduced emissions

Picking Targets and Prioritizing

Screening questions for evaluating the need of advanced metering for the electricity efficient usage

Supply and Network Constraints

Grid Reliability/Blackout Concerns

- Any recent experience of blackouts?
- Are customers being reduce load in response to power concerns?
- Are network planners allocating capital to remove network constraints?

Supply shortfalls

- Have wholesale electricity prices been volatile (due either to capacity shortfalls or fuel price increases)?
- Is there a requirement for new generation capacity?
- Is there an associated reluctance to invest in new generation capacity?
- Is there a developed market in interruptible load and/or demand response for C&I?
- Is there a developed market in interruptible load and/or demand response for Residential customers?

Increasing numbers of distributed energy sources

- Are there programs supporting installation of photovoltaics or domestic microgeneration?
- Are they widely deployed?

Multi-directional power flows

- Are there buyback tariffs for photovoltaics and/or microgeneration?

Picking Targets and Prioritising (cont)

Screening questions for evaluating the need of advanced metering for the electricity efficient usage

Competitive Power Markets

Utility cost-cutting objectives

- Are there financial and/or regulatory incentives for regulated utilities to actively pursue operational cost savings?
- Are there financial and/or regulatory incentives to pursue capex deferral and avoidance (e.g. network substation upgrade)?
- Are there financial and/or regulatory incentives to look for alternatives to network augmentation to ease network constraints?
- Have utilities experienced substantial financial losses resulting from introduction of competition (e.g. poor hedging practices)?

Utility revenue-enhancement/protection objectives

- Are there financial and/or regulatory incentives to actively pursue revenue enhancement (e.g. identification of empty premises, network service improvement)?
- Is there an established prepayment capability that requires upgrading or alternatively an identified requirement to introduce prepayment on a significant scale?
- Are the commercial losses high?
- Is the lack of payment level high?

Picking Targets and Prioritising (cont)

Screening questions for evaluating the need of advanced metering for the electricity efficient usage

Competitive Power Markets (continued)

Growth in sophisticated tariffs

- Does the C&I currently offer TOU/real-time pricing?
- Are utilities and regulators actively pursuing time-of-use (or similar) tariffs?

Customer service expectations

- Are customers changing retailers based on promises of improved service offerings or as a reaction to existing poor service?
- Is there an active energy 'ombudsman' or other consumer advocacy body?
- Is there evidence of existing suppliers competing for new customers on the basis of improved service?

Regulatory framework underpinning liberalized market

- Are the network and retail operations under the same ownership?
- Do the market structures mandate/facilitate interoperability (eg. meter data, transactions, such as customer transfer)?
- Is there an established churn process and if so, is it subject to delays and/or inefficiencies?
- Do rules mandate/support settlement based on real data (versus deemed profiles)?
- Is there a regulatory body (with teeth) pressuring for introduction of AMS, (either at a national or international level)?

Picking Targets and Prioritising (cont)

Screening questions for evaluating the need of advanced metering for the electricity efficient usage

Technology Advances

Improvements in electronics and communications

- Communication Protocol : Are they opened and standardized ?
- Based in field experiences, what are the better communication medias fitting the needs of the market?
Why?

Fare cost vs. higher functionality – cost benefit approach

- Applications where this approach is cost beneficial
- What is current market penetration for load control and is there a business case for enhancement/replacement?
- Electronic metering brings high functionality purpose and are generally used to add tools against losses, to improve financial conditions and to get better information (data). Is that a reality found at the market?

Enhanced IT systems for data management

- Do participants have established meter data management functions?
- Has there been any recent, substantial investment in enterprise systems (eg. SAP) and if so do they support smart metering at the mass market level?
- Do existing systems need to be upgraded to meet current market requirements and utilities needs? (e.g. national regulations, billing , losses prevention , planning ,.....)
- Is there confidence in the ability of existing systems to handle increased volumes of interval data and managing a huge amount of consumers?

Picking Targets and Prioritising (cont)

Screening questions for evaluating the need of advanced metering for the electricity efficient usage

Environmental Pressure

Need for energy efficiency/Demand management

- Is there an established market for energy efficiency/DM that is supported by existing regulation?
- Is there other funding available to support new products and applications?
- Do existing tariffs support energy efficiency/DM?

Climate change concern giving push for alternatives to fossil fuel

- Does the jurisdiction have a commitment to greenhouse reduction?
- Has a utility obligation ensued from such a commitment?
- Is there local evidence that smart metering solutions can contribute to improved energy efficiency?
- Is there an established market price for greenhouse reduction?

Public resistance to proximity to power infrastructure (supply or network)

- Are community and environmental groups objecting to new supply or network (eg. coal plant, nuclear, new transmission capacity, etc)?
- Are the regulations already defined (e.g : environment , legal metrology) ?

Electricity Efficient Usage

Conclusions

Deep analysis on the advantages of high functional metering:

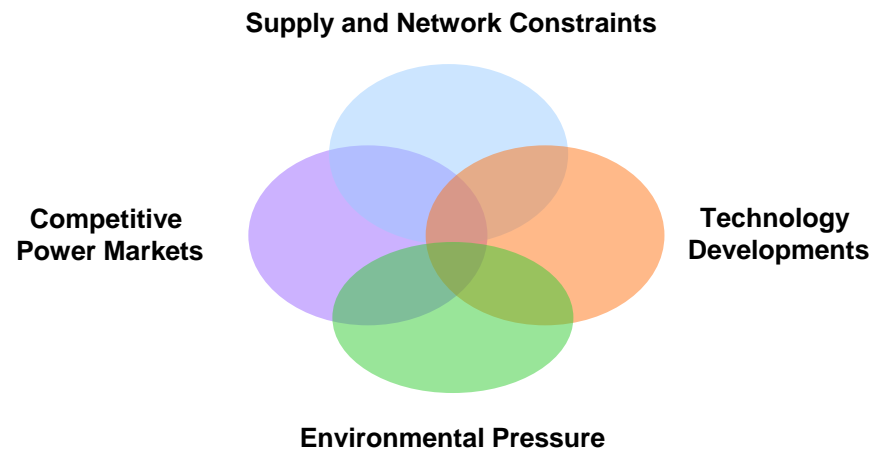
- Short term - higher cost
- Long term - lower cost

Even though electronic metering is a relatively recent and still not consolidated technology, Smart Metering looks to be appropriated for specific applications where added value justify the investment.

- Smaller depreciation period should be considered in order to meet standard life time for electronic products according to local regulations.
- Smaller life time also brings extra costs due to the earlier meter replacement .

Niches for applications:

The recent transformation in the electricity market changed dramatically the profile of the meter application. Several new applications and utilities needs emerged, creating new niches far from the traditional homogeneous market.



New needs -> New solutions