



*Knowledge to Shape Your Future*

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# Metering best practices

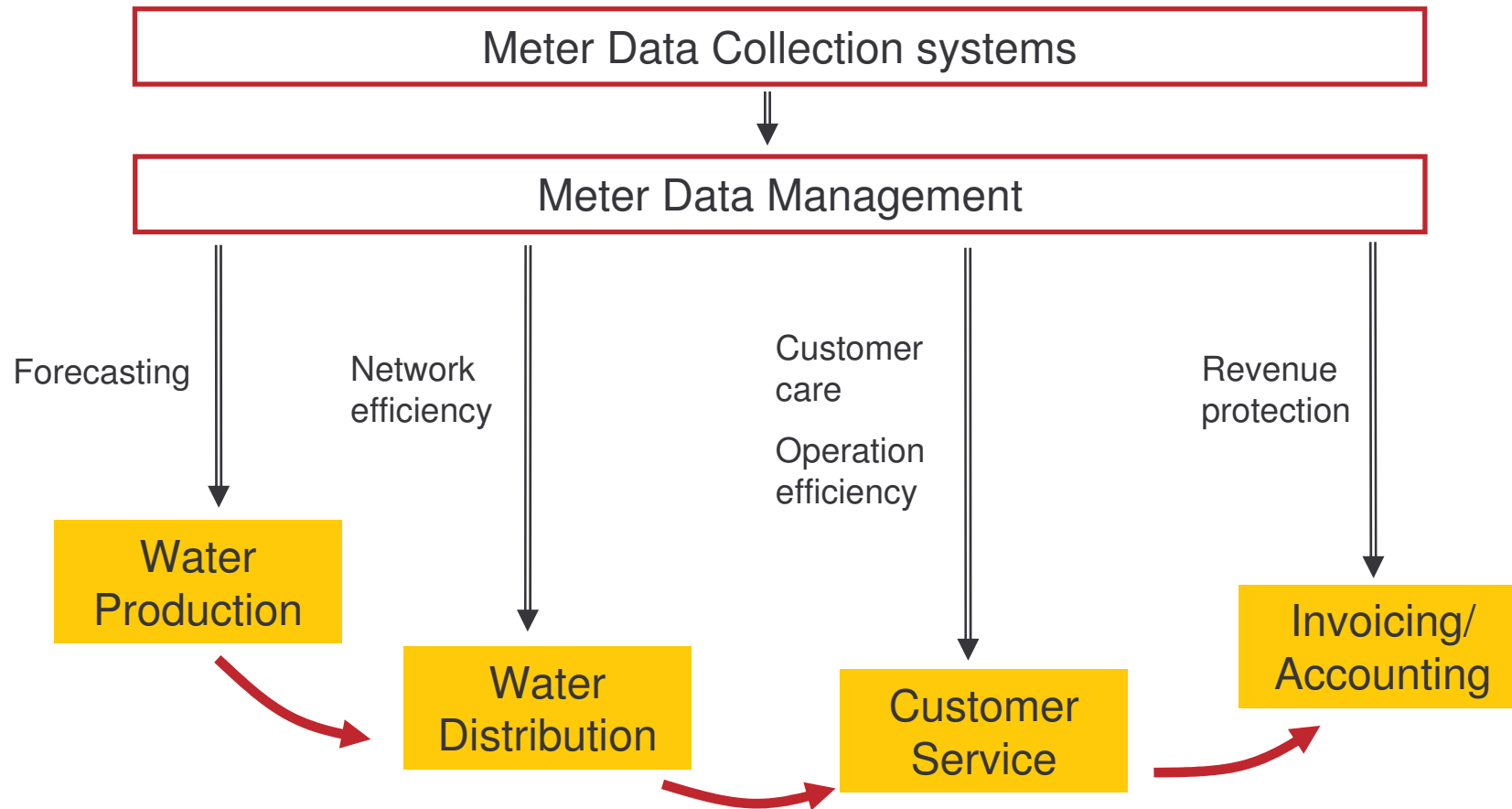
How metering leverages water conservation

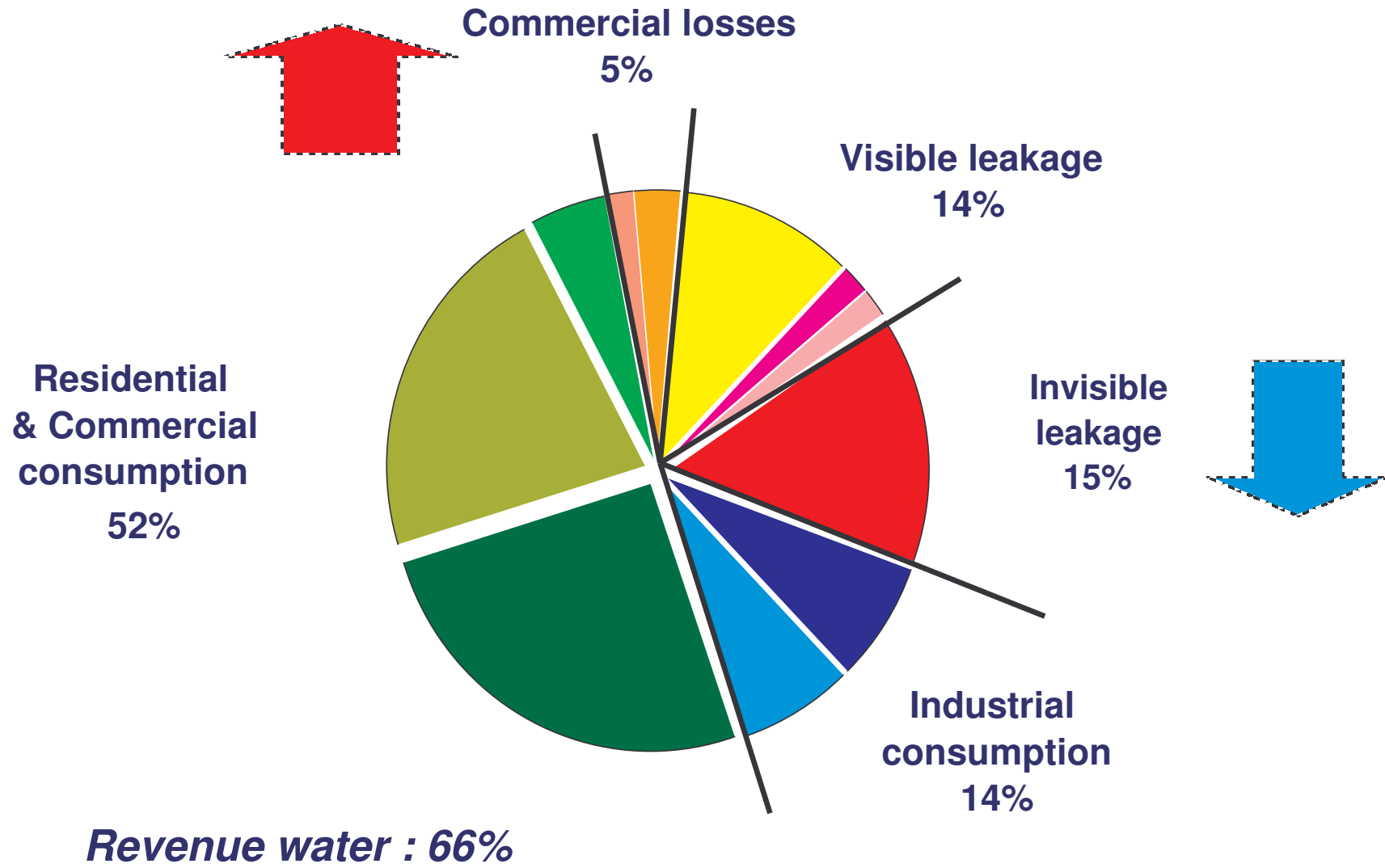


## Metering Systems Role

- Metering systems have to linking water service needs between users and create value for Utilities in two ways:
  - Investments protection, as a shield for water control tool.
  - Hold tariff regimen for sustainable water service development.
- The efficient metering avoid unmeasured volumes, prevent the wrong use of additional resources reaching the right water balance for the service evolution.

# Impact of Advanced Meter Management on operations





## Examples of Non-Revenue Water Associated to Metering

- In Spain: - Resizing and Choosing more appropriate class led to increase in water capture of 10 to 30% per meter.
- In France: - Choosing more appropriate class meter demonstrated 4 to 8% increase in water capture.
- In Australia: - Replacing Old meter with New Meter led to additional 9,000 kL consumption over 3 months = USD 18,000 per year per meter in mid sizes connections ( 2 to 3 Inches)
- In Singapore: - Refurbish Compound meters every 5 years, Singapore have 5% NRW.

## Non revenue water Objective

Objective:

NRW

Control

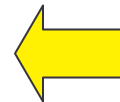


Maintance or decrease  
metrologic sub-metering



Benefits:

- Lower demand by elasticity
- Billing Increase

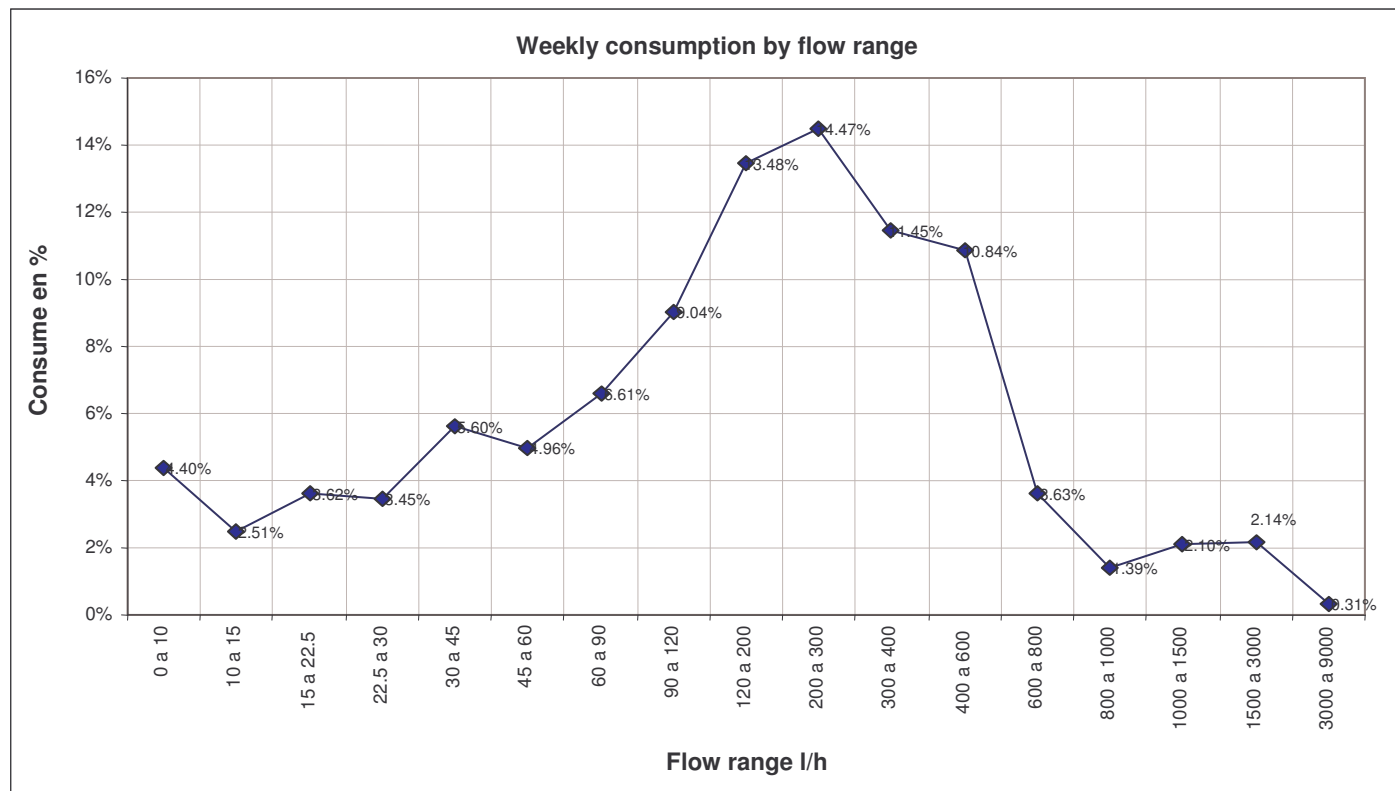


Action:

Meters Change /  
Technologic Renewal

## Consumption profile - What is this?

The way that the customers consume water

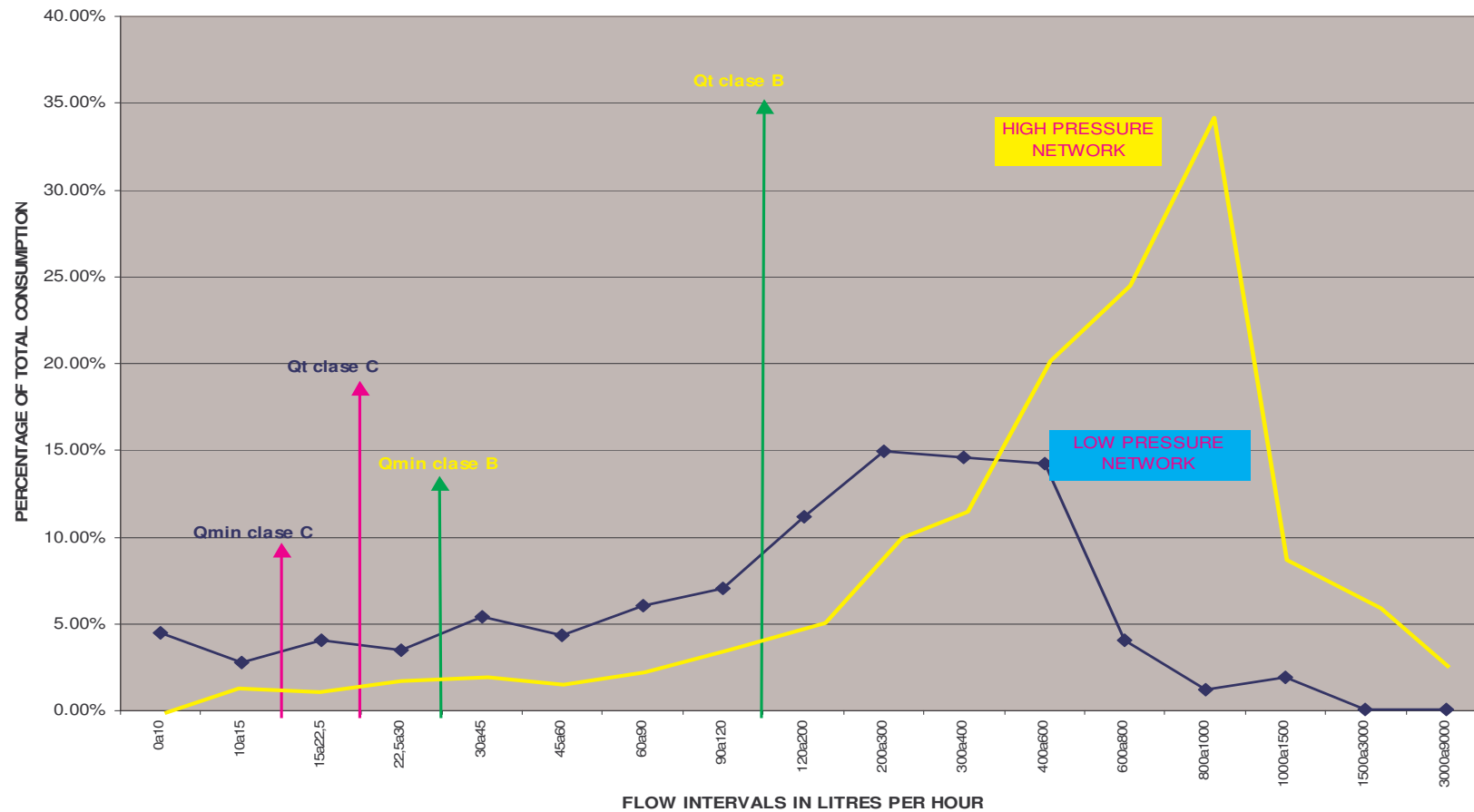


Define how the meter works



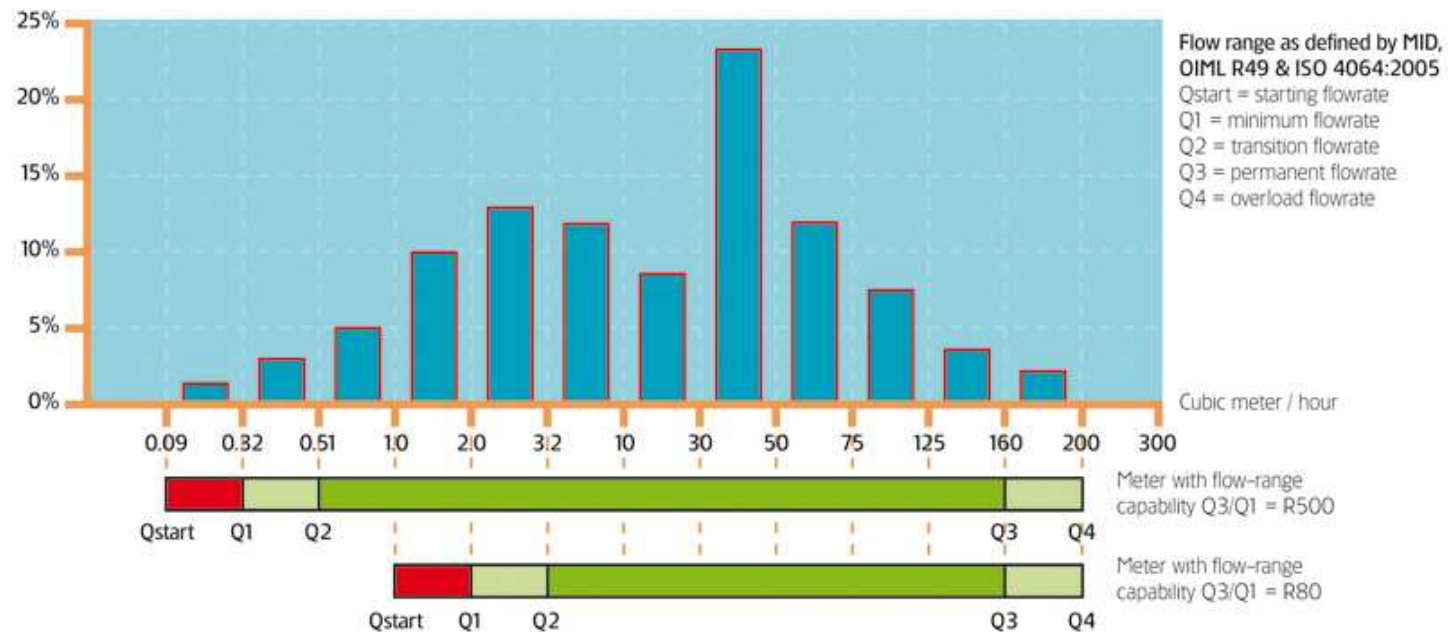
# Consumption Profile - Meter Value

Partial consumption according flow ranges



## What do you need to analyse the meter?

- Flowrate profile against the meter capability.
- Installation conditions meet meter design.



## Meter value – Weighted Average Error

$$EMP = \sum C_i \times E_i$$

Performance

**C<sub>i</sub>** : coefficient assigned to flow Q<sub>i</sub>. Shows volume percentage consumed at Q<sub>i</sub> by consumption profile.

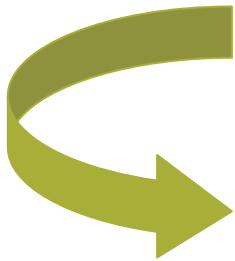
[Sum Q<sub>i</sub> = 1]

**E<sub>i</sub>** : meter error in flow Q<sub>i</sub>.

$$\text{Meter Value} = \left\{ \begin{array}{l} -[\text{Cost (Price) + Amortization (s/ tax shield)}] \\ + \sum_{i=0}^n i (\text{Gain} \times \text{performance}) I, n \end{array} \right\} (1-t)$$

NPV (meter)

Dynamics:  
Change through time



## Historical Evidence

From 1999 to 2009, Itron International has audited a lot of meters coming from the field.

Major findings:

- > **Improper installation: 61%**
- > **Indication of leakage (after meter): 41%**
- > **Meter over-sized: 29%**
- > **Meter under-classed (B vs C): 23%**
- > **Meter under-sized: 19%**
- > **Meter under water: 14%**

Recommendations :

- > **Select the right meter according to each consumption profile**
- > **Standardize the installations**

**The meter audit campaign has brought significant achievements to the NRW reduction program.**

# Business cycle of metering

## Meter's research

Diameter & Class segmentation  
Consumption segmentation

## Consumption Profile

How the customers consume

=

How the meter is losing accuracy



## Meter efficiency determination

Accuracy tests for meters based in consumption profile :

- More profitable accuracy
- Useful life determination

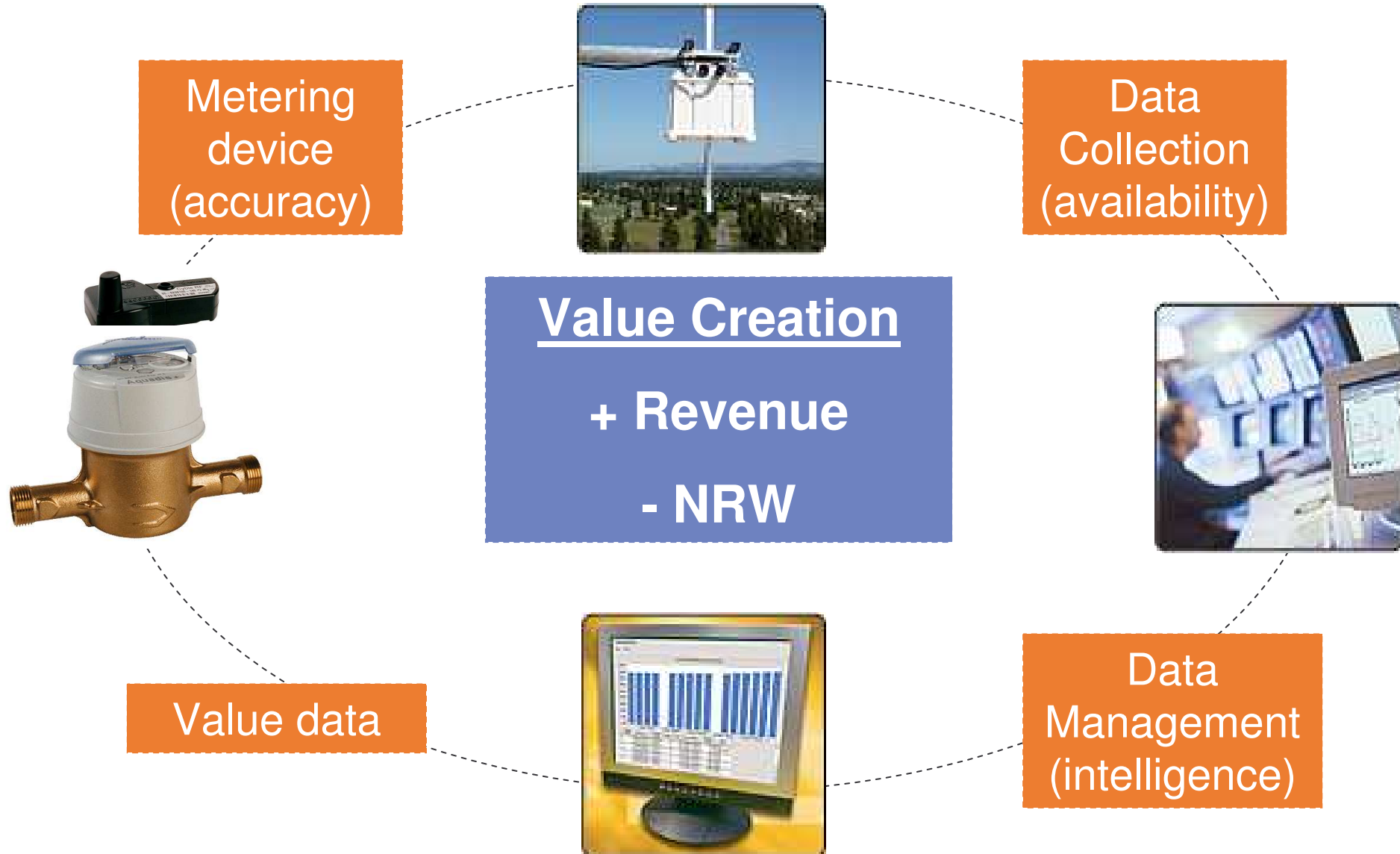


## Metering policy

Requirements of technological evolution

# Data Management Value Chain

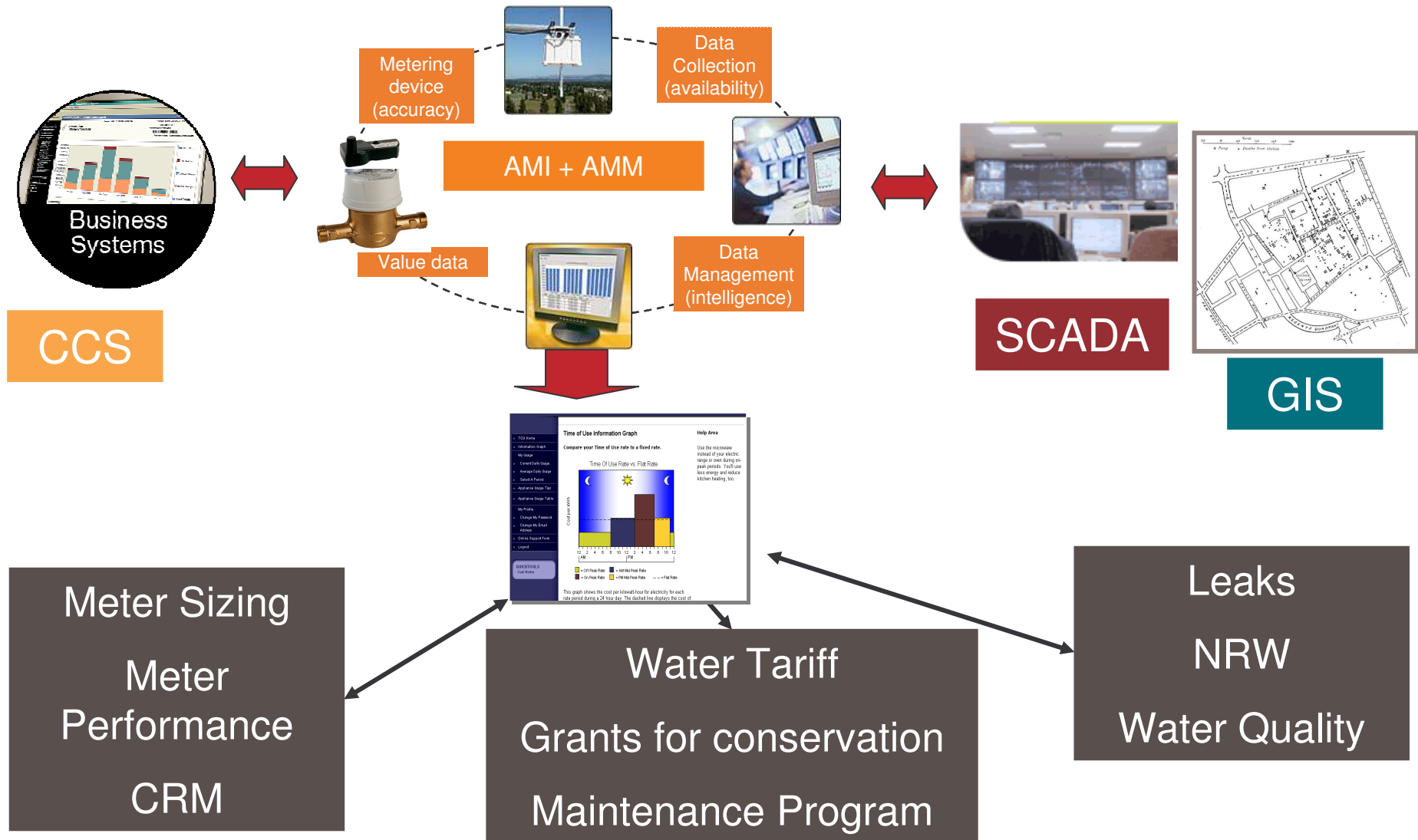
Water



# Renewed Business model : Complete Water Business Data Chain



- ▶ To offset the lack of information that today generates bad investment decisions,
- ▶ non-adequated tariff structures and customers complaints.



## Remarks

- **Right meter depends of kind of customer, his consumption profile and water service conditions.**
- **Request balance between useful lifetime of meters and customer profile.**
- **Integration & coordination of public needs, normatives and related industries.**