

Security Managing Smart Metering System

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Prologue

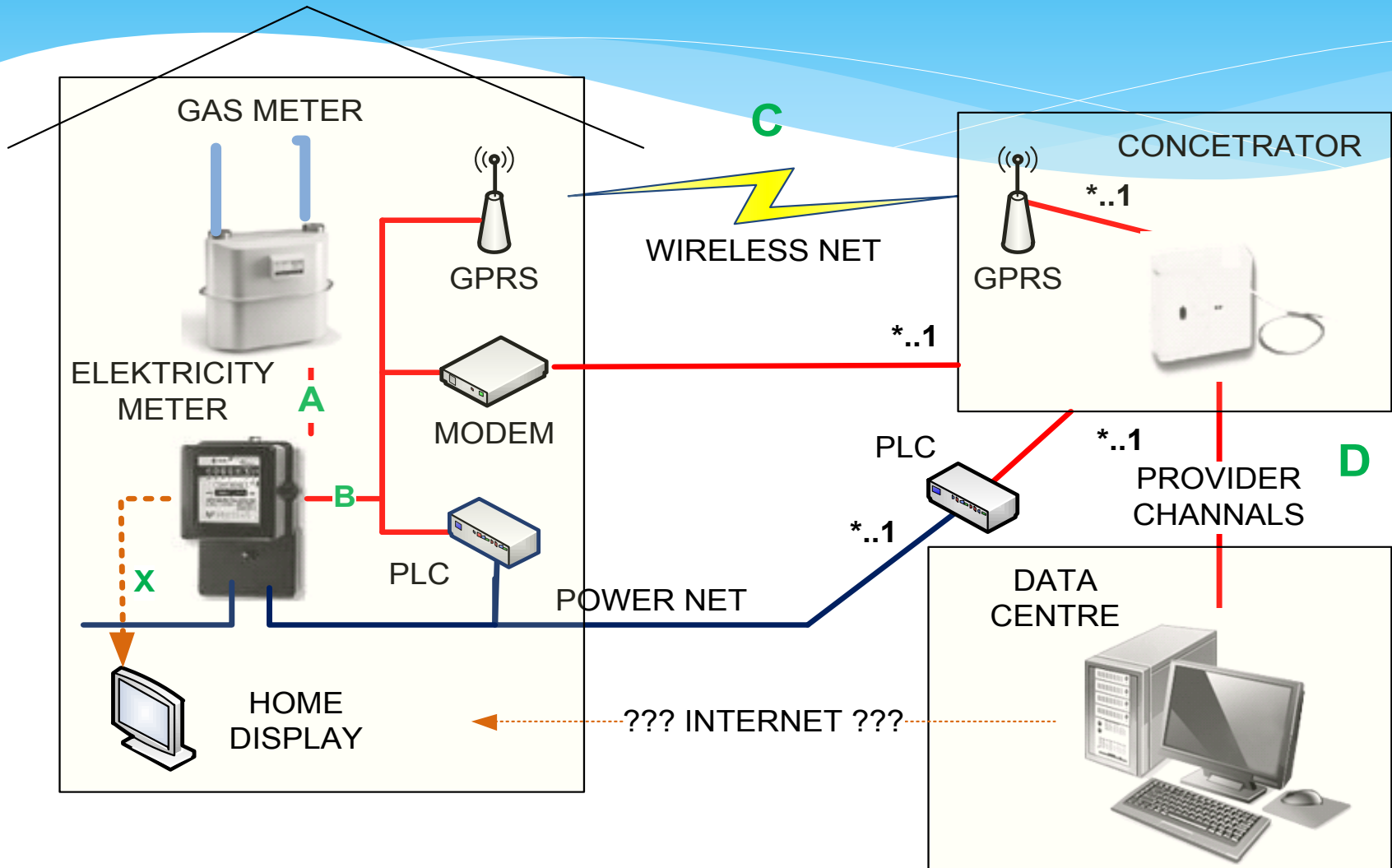
- The emergence of new energy sources (environmental)
- Requirements differ to the new order network
- New distributed network management = **Smart Grid**
- Part of Smart Grid is the **Smart Metering System**



USE



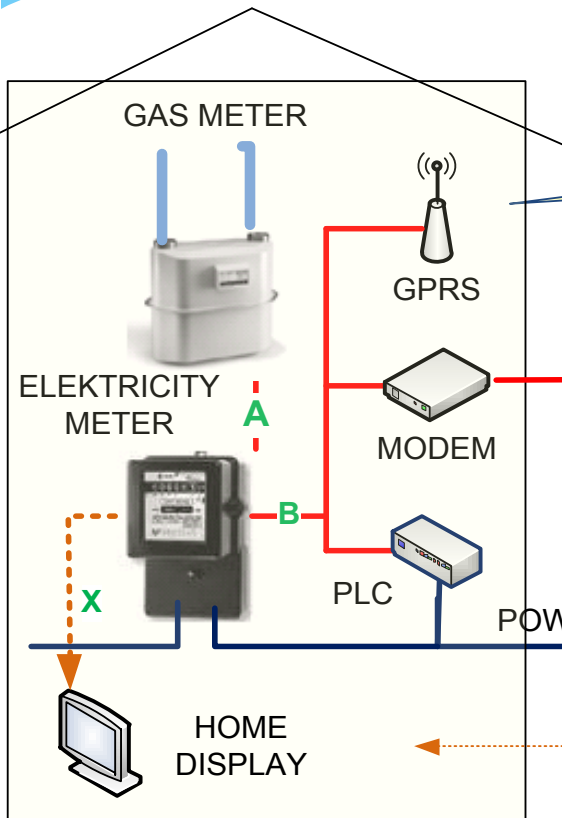
SMR – System Data Description



Security Risks

- * **External risks:** a system attack and penetration into the reading centre by an external entity. This predominantly includes firewall breakthrough, or theft and misuse of access data of the existing users.
- * **Internal risks:** unauthorised interventions by internal users, both intentional and unintentional.

Internal risks of meter security

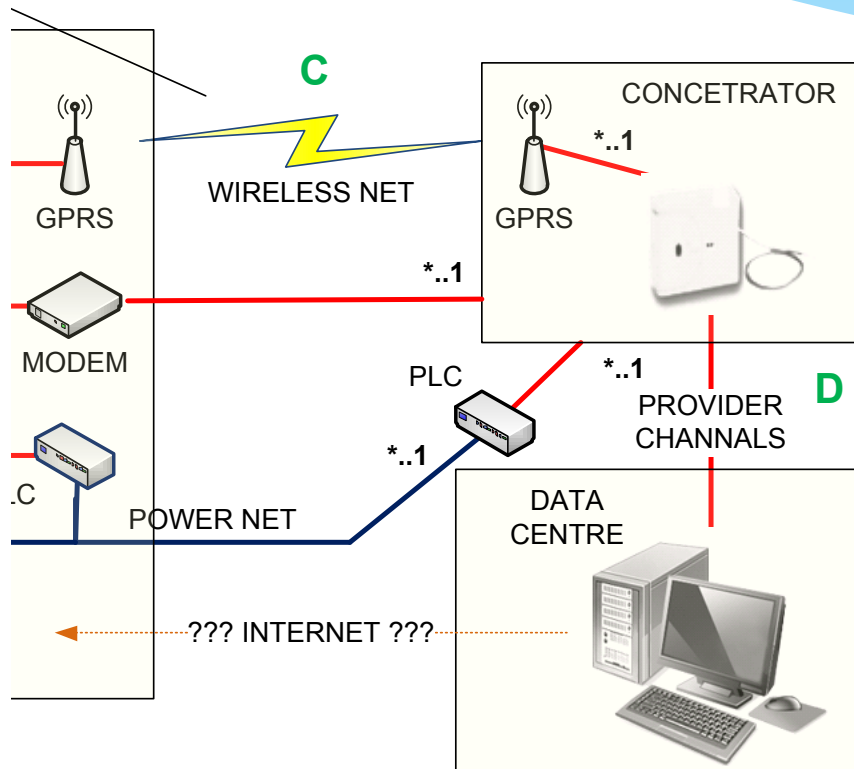


* **Breaking the security SW of the meter**
(attacks via communication interfaces or remote communication);

* **Access via communication interfaces or remote access** (attacking the key functions of the meter, such as switch off etc);

* **Breaking access via reading terminals – optical interface and subsequent manipulation of meter parameters.**

Extern security risks



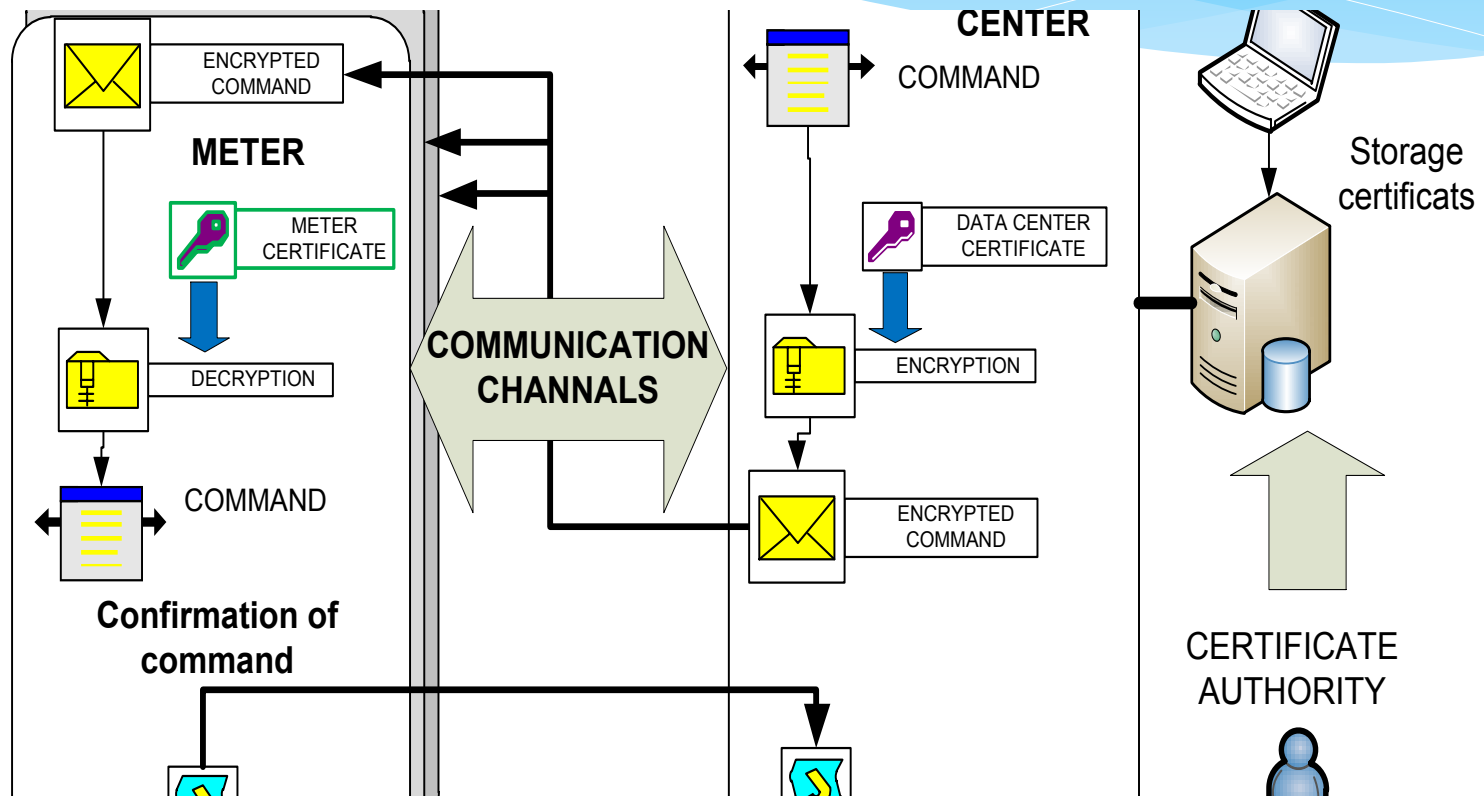
- * Breaking access to the reading centre and manipulation such as:
 - * **Unauthorised** meter switch off;
 - * Remote preliminary **meter set-up**;
 - * **Data removal** from the centre;
 - * **Data change** in the centre;
 - * **Theft of data**;
 - * **Theft of password**;
 - * **Password change**.

Metered Data Protection

The requirements for the protection of data transfer from the meter to the data centre may be summarised as follows:

- * **The data must be hidden from other utilities** in the meter-reading process. It is often the case that the gas meter belongs to one company and the electricity meter to another. Sometimes, data transfer is assigned to a telecommunications firm.
- * **Data from each meter must be in one block** so that they may be assigned to the relevant supply points and archived.
- * Data cannot be changed without any indication of the author of the **change**.
- * **Data must have their original form** in which they were sent by the meter because in the event of any conflict, evidence of the source data must be provided.

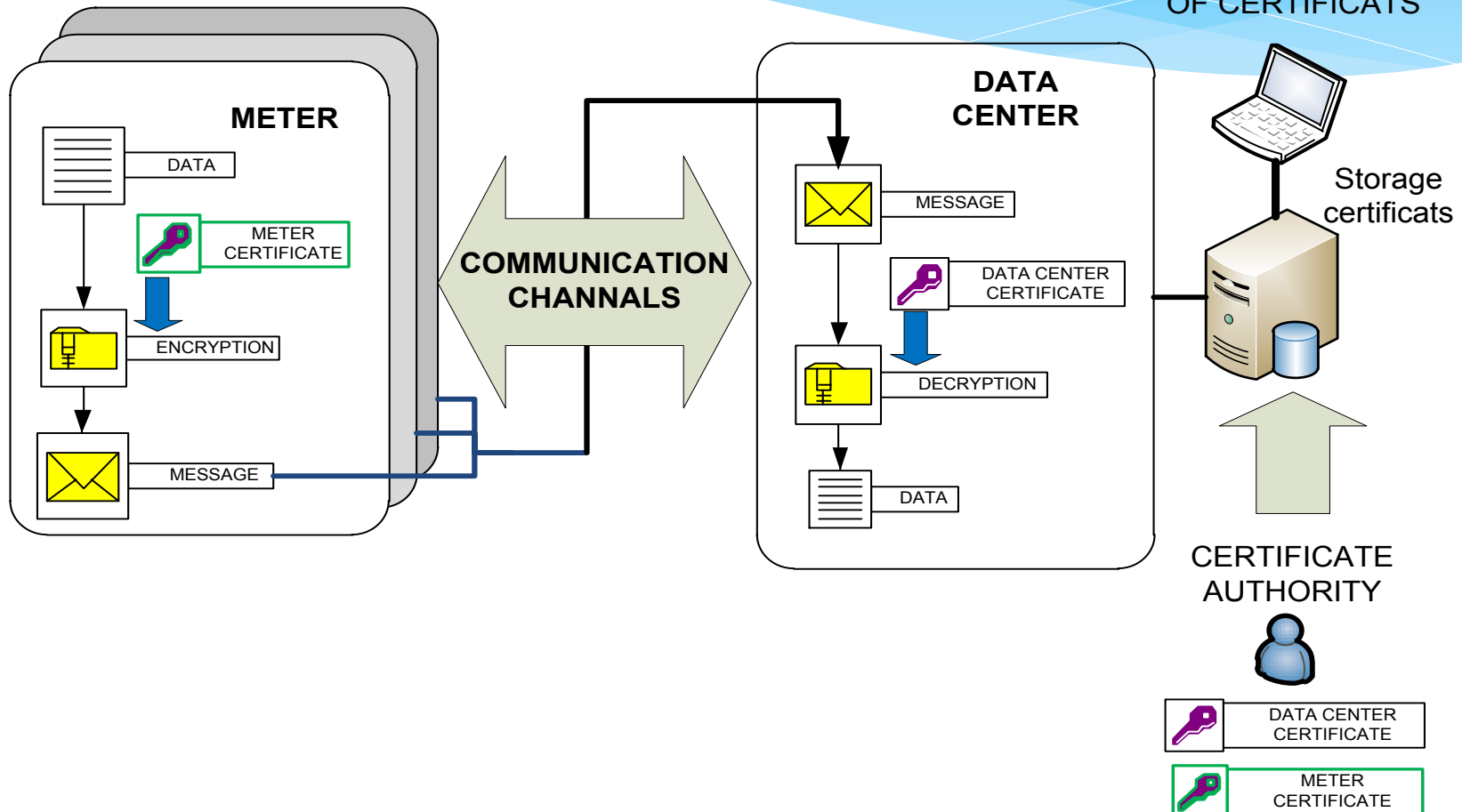
Handing Over Commands



Handing Over Data

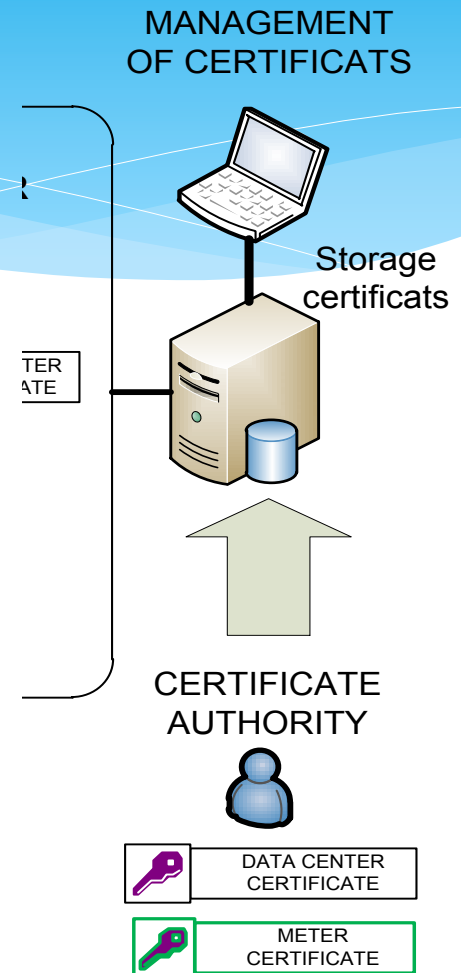
Handing Over Data

MANAGEMENT OF CERTIFICATES



Security Management in SMR Systems

- * In addition to the data centre, the system must have **certificate storage administered** by the server from where lifecycles of individual certificates in the system will be managed.
- * A certification authority must be established in the **relevant utility**. If not, public certification authorities may be used. However, millions of certificates per year must be taken into consideration. This is likely to be resolved depending on the economic aspects.

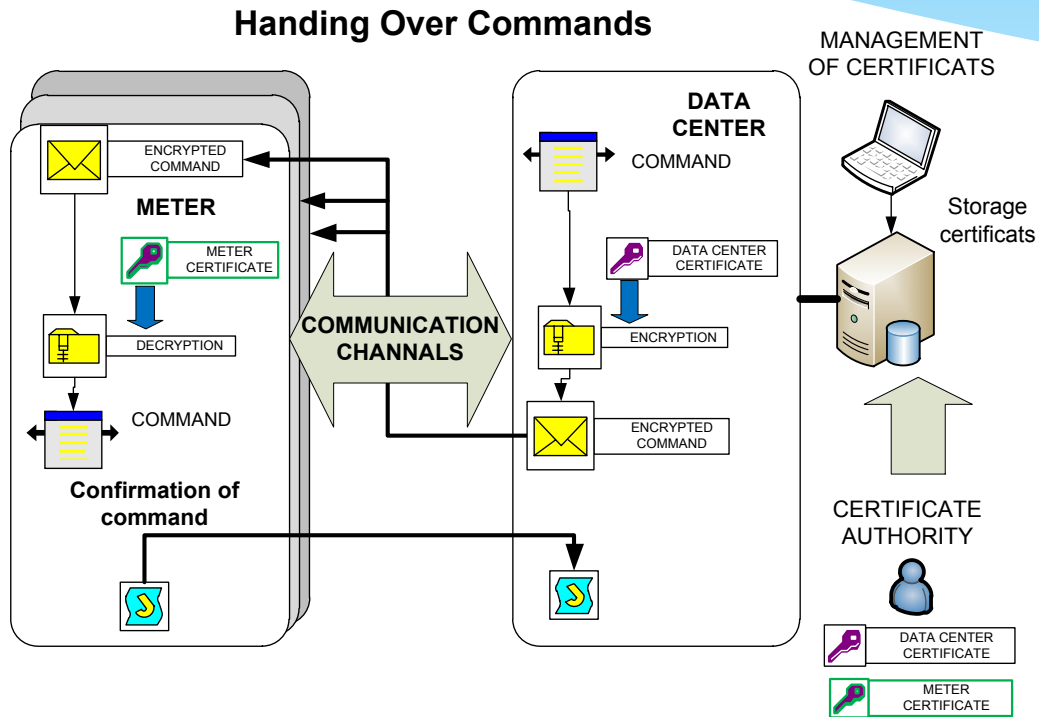


Security Management in SMR Systems

- * **Certificates with a lifecycle** of up to two years must be issued for meters. **The certificates must be delivered to the meters.**
- * Certificates with short lifecycles, which will be assigned in instrument calibration facilities and will be used for meter installation only, must be established. Subsequently, they will be replaced by standard certificates with long lifecycles.
- * **As meters are installed by a third party**, certificates for those firms will have to be generated so that the firms may put the meters into operation.
- * Certificates for service and control teams performing emergency or review meter readings will be required.
- * Additional requirements are to be solved immediately after the system's introduction, such as statistics etc.

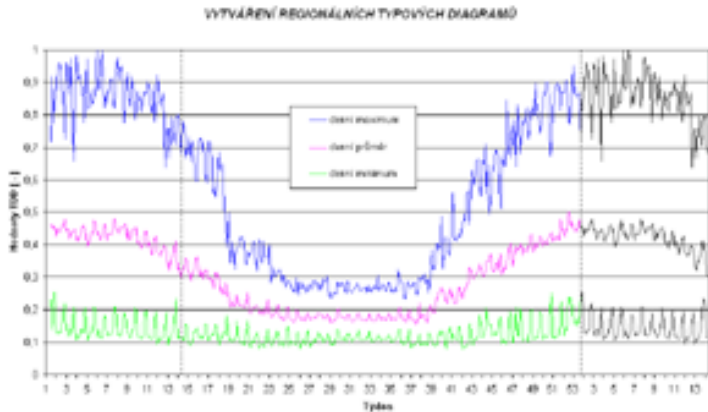
Security Management - FACTS

BRUTE FACTS:



- > 1 000 000 piece of meters points
- Live cycle certificates 1-2 years
- Service team and meter reading team with hand terminals include the certificates.
- Permanent meter calibration is every 10 -15 years > **100 per day**

Personal Data Protection



Watch out!

A very complicated situation may occur if customers do not agree with downloading continual data on consumption. This alternative has only been discussed theoretically in the Czech Republic so far. However, experience from the Netherlands is a warning. **Local people often do not want to be monitored though energy consumption.**

Read and metered values must be considered confidential information in terms of personal data protection and as such should rank among **personal data** under law. Unfortunately, metered values are not considered personal data at present.

Questions

Do you have any questions?

