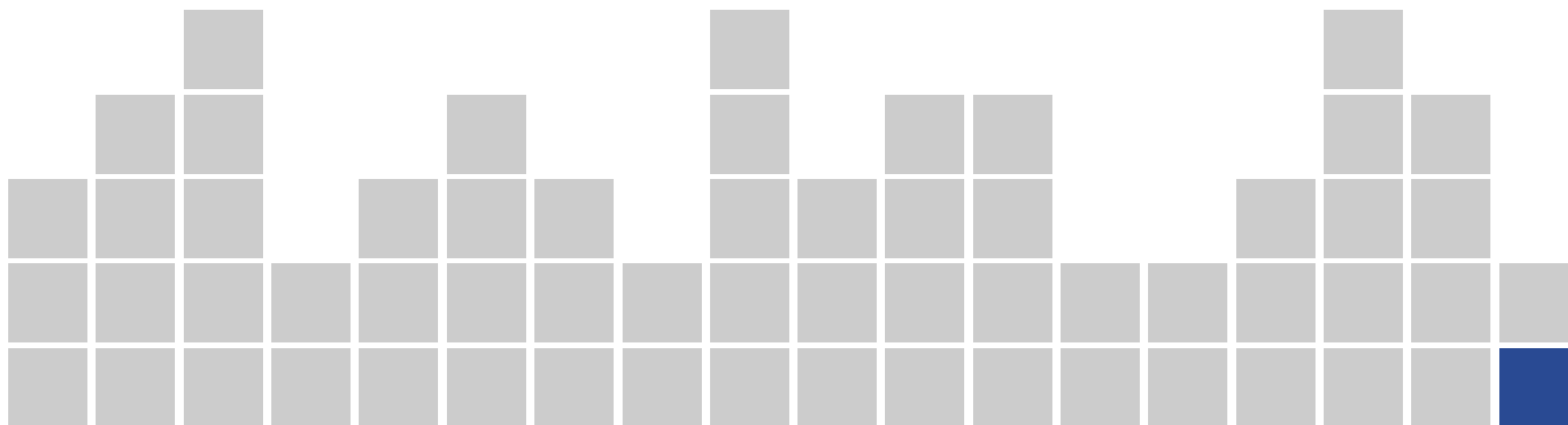# ESMIG
WE MAKE METERING SMART

Task Force Smart Grids - Expert Group 2:
Steering Committee Report

April 21st 2010

Frank Hyldmar
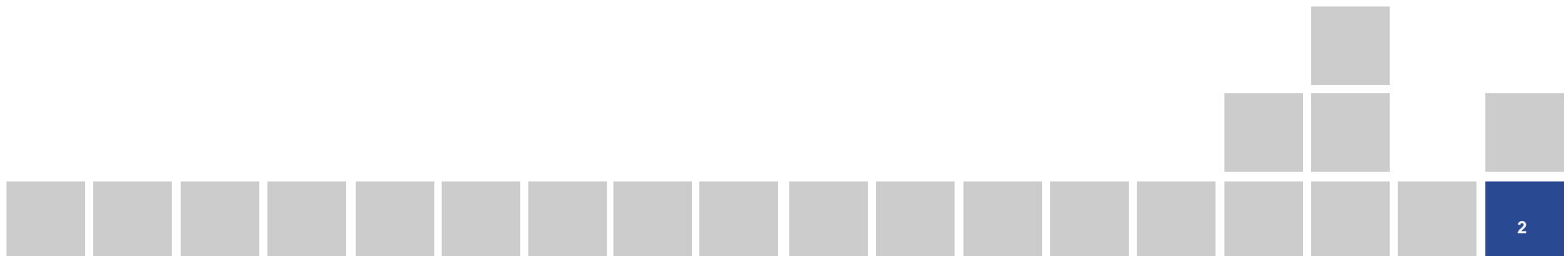**Chairman for Expert Group 2, Vice President**
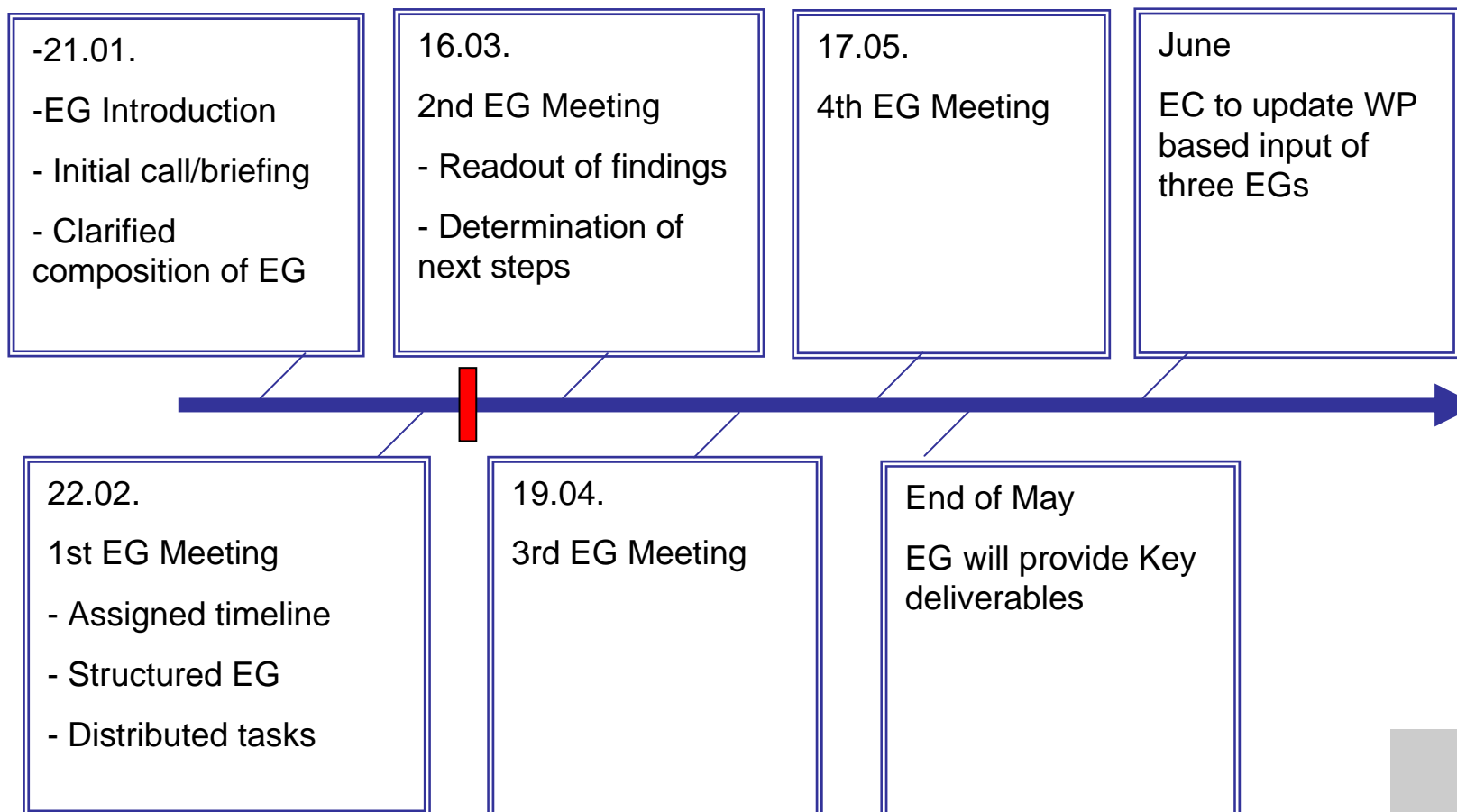**ESMIG, Executive VP EMEA, Elster Group**

Expert group 2 - Regulatory recommendations for data safety, data handling and data protection

"The key deliverable is to identify the appropriate regulatory scenario and recommendations for data handling, safety and consumer protection"

Timeline

-21.01.

-EG Introduction

- Initial call/briefing

- Clarified composition of EG

16.03.

2nd EG Meeting

- Readout of findings

- Determination of next steps

17.05.

4th EG Meeting

June

EC to update WP based input of three EGs

22.02.

1st EG Meeting

- Assigned timeline

- Structured EG

- Distributed tasks

19.04.

3rd EG Meeting

End of May
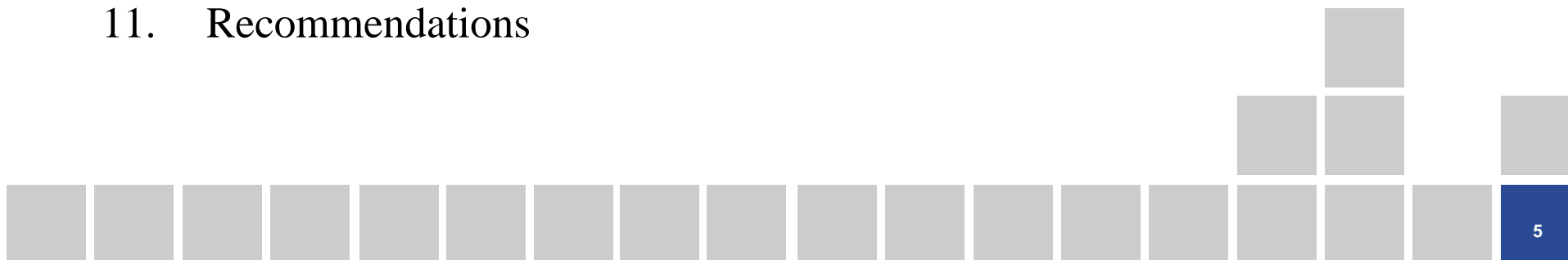
EG will provide Key deliverables

Distribution of Tasks

- **Sub-Group 1: Definitions**
  - **Provide definition of key items**

- **Sub-Group 2: Inventory (EU level)**
  - **Overview of situation in member countries**

- **Sub-Group 3: Benchmark of other industries/countries**
  - **Additional input form other sectors (i.e. telecom) and non-EU countries**

- **Sub-Group 4: Recommendation for Open Standards**
  - **View on existing standards and value chain**

- **Sub-Group 5: Recommended Framework**
  - **Covering Data Safety, Data Protection, Data Handling**

- **Sub-Group 6: Recommendation on Smart Grid benefits/risks**
  - **Share information from available research (ETP, ENERGATE)**

- **Sub-Group 7: Business Case Smart Grid/Smart Meter**
  - **Economical view on SM/SG implementations**

Final table of content

1. Introduction
2. Scope
3. Definitions
4. Smart Grid benefits
5. Architecture
6. Interfaces
7. Data risks
8. Existing standards
9. Identified gaps
10. Recommended framework
11. Recommendations

Definitions

Term	Original Source	Suggested Definition for review/consideration
Smart Grid	**Eurelectric (Updated)**	"A smart grid is a utility network that can intelligently integrate the behaviour and actions of all users connected to it in order to efficiently ensure sustainable, economic, and secure product supply. The product in question can be electricity, gas, water or heat.
	Additional material	**A smart grids offers the functionality of an automated or semi automated information exchange between …** **a)… private/corporate energy producing devices and e-cars, utility networks and centralized production in order to guarantee grid stability** **b)… private devices that offer transparency for individuals with focus on price information and carbon footprint targeting on a sustainable new energy consuming eco system.** **The vision of smart grids is to enable the transition from a centralized energy infrastructure to a more decentralized generation structure by integration of prosumers but also to influence the behaviour of each individual that acts as an energy consumer.**

Definitions

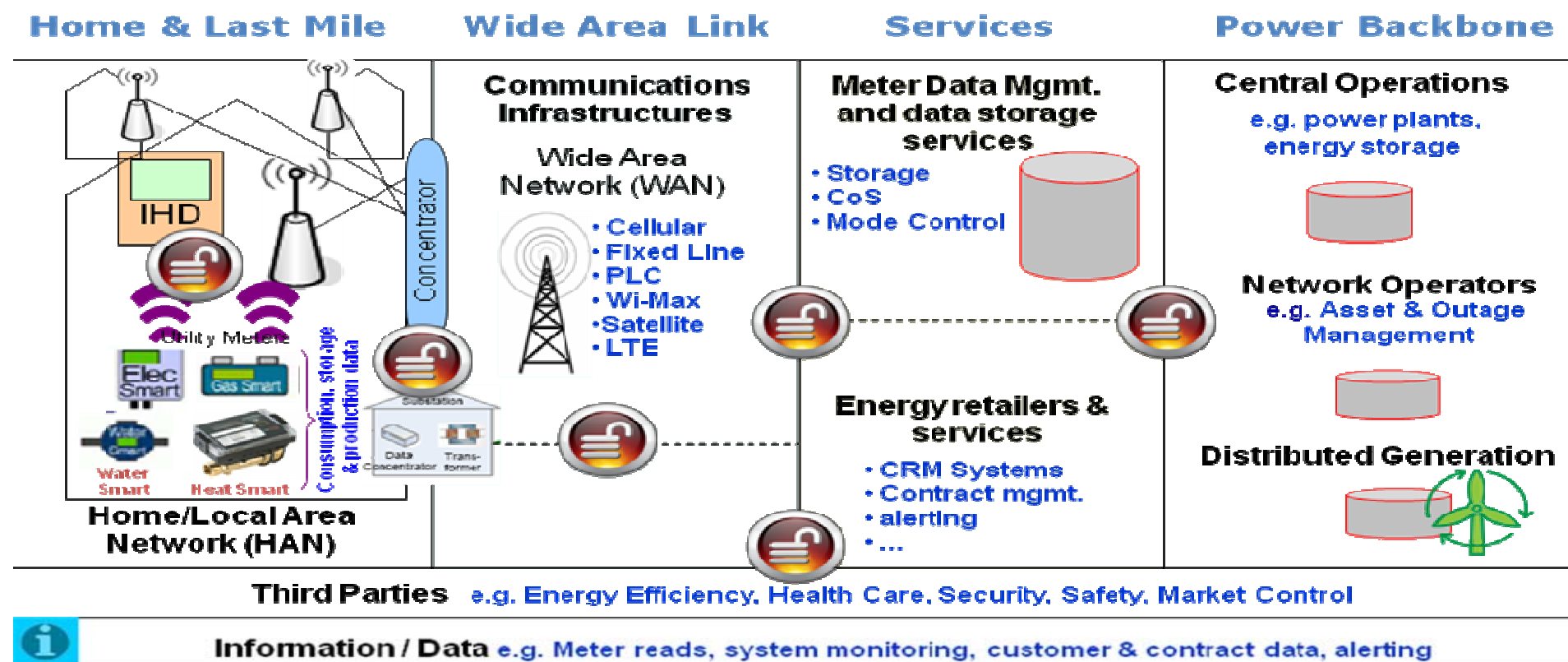| Term	Original Source	Suggested Definition for review/consideration
Smart Metering	**European Smart Metering Alliance (Updated)** Joachim Kabs Update	Smart metering is designed to provide utility customers with information basis about their domestic consumption. This information includes data on how much of a specific product (electricity, gas water or heat) they are consuming, how much it is costing them and what impact their consumption is having on greenhouse gas emissions. The smart meter will provide configurable but utility specific basic data (e.g. consumption & billing) to other customer devices by means of a standardized data interface. When indicated by a grid signal as being defined in ERGEG the smart meter will additionally act as a load balancer/mediator between decentralized product providers and the grid by means of specific control functions or operation schemes.

Term requiring Definition	Original Source	Suggested Definition for review/consideration
Data Security	44 U.S.C. § 3542(b)(1) definition of "information security"	Protecting information and information systems from unauthorized access, use, disclosure, disruption, modification, or destruction in order to provide— (A) integrity, which means guarding against improper information modification or destruction, and includes ensuring information nonrepudiation and authenticity; (B) confidentiality, which means preserving authorized restrictions on access and disclosure, including means for protecting personal privacy and proprietary information; and (C) availability, which means ensuring timely and reliable access to and use of information.

Definitions

Term requiring Definition	Original Source	Suggested Definition for review/consideration
Data Handling	Unknown	The process of ensuring that data is stored, archived or disposed off in a safe and secure manner during and after the conclusion of a process.
Data Protection	OECD Glossary of Statistical Terms	Data protection refers to the set of privacy-motivated laws, policies and procedures that aim to minimise intrusion into respondents' privacy caused by the collection, storage and dissemination of personal data.
Data Privacy	OECD Glossary of Statistical Terms	It is the status accorded to data which has been agreed upon between the person or organisation furnishing the data and the organisation receiving it and which describes the degree of protection which will be provided.

Smart Grid - Interfaces

Home & Last Mile

Communications Infrastructures

Wide Area Network (WAN)
- Cellular
- Fixed Line
- PLC
- Wi-Max
- Satellite
- LTE

IHD

Consumption, storage & production data

Utility Meters

Elec Smart | Gas Smart

Water Smart | Heat Smart

Concentrator

Data Concentrator | Trans-former

Home/Local Area Network (HAN)

Wide Area Link

Services

Meter Data Mgmt. and data storage services
- Storage
- CoS
- Mode Control

Energy retailers & services
- CRM Systems
- Contract mgmt.
- alerting
- ...

Power Backbone

Central Operations
e.g. power plants, energy storage

Network Operators
e.g. Asset & Outage Management

Distributed Generation

Third Parties e.g. Energy Efficiency, Health Care, Security, Safety, Market Control

Information / Data e.g. Meter reads, system monitoring, customer & contract data, alerting

= Interface Risk

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List of interfaces

Interface No.	Between	Notes	Data
1	Meter to IHD	Technical Interface representing HAN, main security risk to consumer data. Prepayment metering risk is network is unsecured.	Meter reads (Con) Pricing info (Con) Tariff Info (Con)
2	HAN to LAN	Used in PLC and long range RF mesh topology. Larger risk to security of data due to visibility of many meters.	Meters Reads (Con) Load Profile (Con) Alarms (Con)
3	LAN to WAN	Not used in Point to Point. Security risk at higher level as consequence of data theft is greater due to data quantity.	Meters Reads (Con) Load Profile (Con) Alarms (Con) Meters Reads (Sub) Load Profile (Sub) Alarms (Sub)
4	WAN to Head Ends / DC businesses	Competitive model	Meters Reads (Con) Load Profile (Con) Alarms (Con)
5	WAN to Central DC	Vertical Model	Meters Reads (Con) Load Profile (Con) Alarms (Con)
6	LAN/WAN/DC to Network Operator	Substation monitoring	Meters Reads (Sub) Load Profile (Sub) Alarms (Sub)

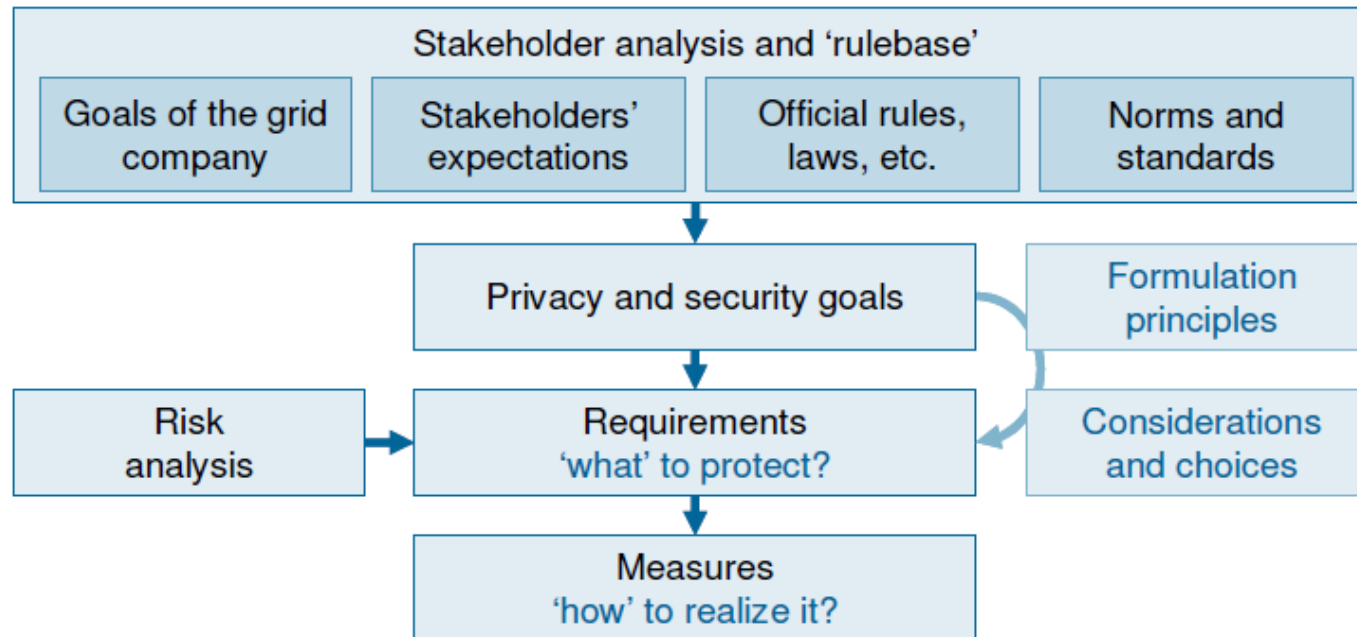| 7	LAN/WAN/DC to Energy Retail	For billing and additional services	Meters Reads (Con) Load Profile (Con) Alarms (Con)
8	Prosumer Generation to distribution Network Operator	For load management	Meters Reads (Pro) Load Profile (Pro) Alarms (Pro)
9	Prosumer Generation to Energy Retail	For billing purposes (FITs)	Meters Reads (Pro) Load Profile (Pro) Alarms (Pro)
10	Energy Retailer to Third Parties	For additional services	Meters Reads (Con) Load Profile (Con)
11	Meter to Third Parties	For Energy Services	Meters Reads (Con) Load Profile (Con)
12	Prosumer Generation to Third Parties	Distributed generation aggregation services	Meters Reads (Con) Load Profile (Con)
13	Meter to MOp	Installation data and downloading of tariffs on installation	Meters Reads (Con) Load Profile (Con) Tariff Data

Data risks (illustrative)

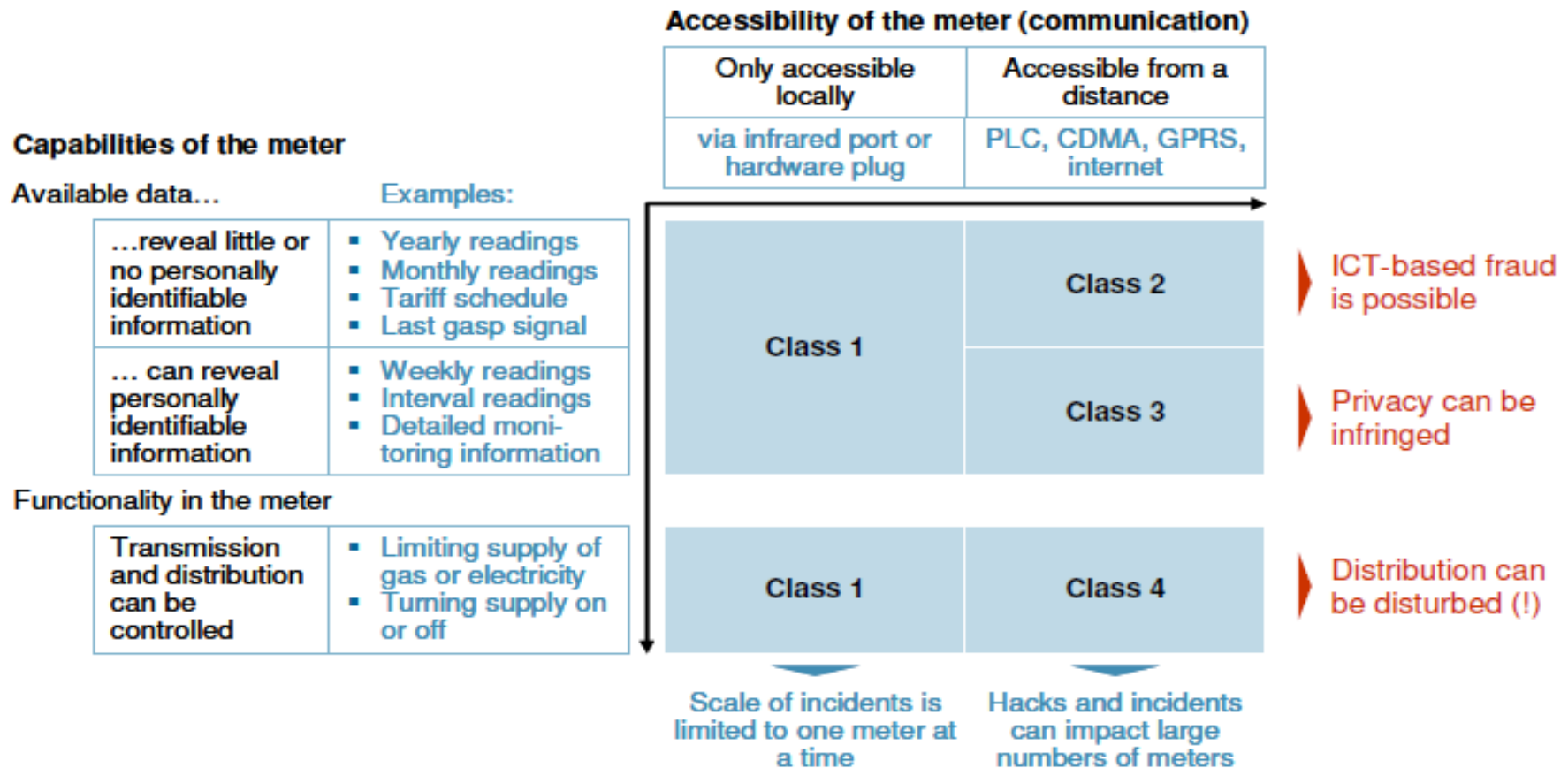| Interface	Description	Severity	Likelihood	No. Affected	Total	Notes
1	Meter to IHD	1	4	1	4	
2	HAN to LAN	3	3	2	18	
3	LAN to WAN	4	3	3	36	
4	WAN to Head Ends / DC businesses	4	2	5	40	
5	WAN to Central DC	5	2	5	50	
6	LAN/WAN/DC to Network Operator	5	2	5	50	
7	LAN/WAN/DC to Energy Retail	5	2	5	50	

List of standards (illustrative)

EN 62055-31	Electricity metering – Payment systems – Part 31: Particular requirements – Static payment meters for active energy (classes 1 and 2)	N/A
EN 62056-21	Electricity metering – Data exchange for meter reading, tariff and load control – Part 21: Direct local data exchange	13
EN 62056-31	Electricity metering – Data exchange for meter reading, tariff and load control – Part 31: Use of local area network on twisted pair with carrier signalling	1
EN 62056-42	Electricity metering – Data exchange for meter reading, tariff and load control – Part 42: Physical layer services and procedures for connection-oriented asynchronous data exchange	2,3,4,5,6,8,9,11,12
EN 62056-46+am1	Electricity metering – Data exchange for meter reading, tariff and load control – Part 46: Data link layer using HDLC protocol	2,3,4,5,6,8,9,11,12
EN 62056-47	Electricity metering – Data exchange for meter reading, tariff and load control – Part 47: COSEM transport layers for IPv4 networks	2,3,4,5,6,8,9,11,12

Dutch example for framework

Stakeholder analysis and 'rulebase'

| Goals of the grid company | Stakeholders' expectations | Official rules, laws, etc. | Norms and standards |

Privacy and security goals → Formulation principles

Risk analysis → Requirements 'what' to protect? → Considerations and choices

Measures 'how' to realize it?

Dutch example for framework

Accessibility of the meter (communication)

Only accessible locally	Accessible from a distance
via infrared port or hardware plug	PLC, CDMA, GPRS, internet

Capabilities of the meter

Available data...

...reveal little or no personally identifiable information	Examples: • Yearly readings • Monthly readings • Tariff schedule • Last gasp signal
... can reveal personally identifiable information	• Weekly readings • Interval readings • Detailed monitoring information

Functionality in the meter

Transmission and distribution can be controlled	• Limiting supply of gas or electricity • Turning supply on or off

Class 1	Class 2 — ICT-based fraud is possible
Class 1	Class 3 — Privacy can be infringed
Class 1	Class 4 — Distribution can be disturbed (!)

Scale of incidents is limited to one meter at a time

Hacks and incidents can impact large numbers of meters

Action plan

- Table of content to be filled by April 30

- Advanced draft to be discussed May 10

- Walk through final draft May 17

- Socializing with the stakeholders until end May

- Submission end May
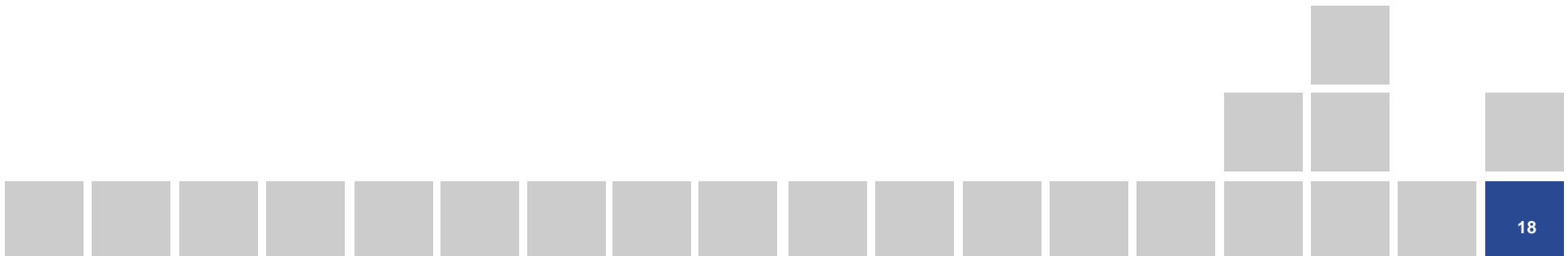
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