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Ideas for a common scenario

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Main actors in THEMA-report [1]

- Overviews the current Nordic situation in transitioning to Smart Grids

- Transmission System Operator
- Distribution System Operator
- Electricity Supplier
- Customer
- Data Exchange Platform
- Third Parties, including Energy Service Companies

- Information exchange refers to:
  - consumption measured in kWh over a specified time period,
  - peak consumption,
  - name and address of customers,
  - information on the type and identity of meter and similar information

[1] Mapping of TSO and DSO roles and responsibilities related to information exchange

Focus on local characteristics

- The Norwegian power market is a fragmented market with more than 130 DSOs and more than 100 retail suppliers.
- Norway has a target for roll-out of smart meters for 2019 and is in an advanced stadium for development of a centralized data-hub.

[1]Mapping of TSO and DSO roles and responsibilities related to information exchange

TSO – rights and obligations

- The TSO is the Imbalance Settlement Responsible that is responsible for the financial settlement of the electricity. This applies for the current regulation **as well as in the revised regulation**.

- The TSO will have the responsibility **to develop and operate the Elhub**. The Elhub will then be the Metered Data Aggregator and Metered Data Administrator.

- Operation of the data-hub will be allocated to the TSO as imbalance settlement responsible.

[1]Mapping of TSO and DSO roles and responsibilities related to information exchange

DSOs – rights and obligations

- Currently the DSOs are responsible for collecting and distributing metering data to other market actors (meter operation, data collection, data storage, meter data validation and distribution of data to other market participants)
- The DSO is obliged to provide data to suppliers (for billing), customers (on request) and the TSO (for imbalance settlement purposes). The DSO also provides the necessary information in supplier switching and other business processes. In the current regime third party access to consumption data is possible if AMS is installed. This is the responsibility of the DSO.
- The DSO remains responsible for collection and distribution of data to the ELHUB. As Metered Data Collector, the DSO will be responsible for collection of meter data from the metering point. As Metering Point Administrator the DSO will be administrating (and owning) the meter. And as Metered Data Responsible the DSO will be responsible for validation of metered data.
- With the development of more data-hubs it is expected that more responsibilities transfer from DSOs to data-hubs.

[1]Mapping of TSO and DSO roles and responsibilities related to information exchange

Third Parties – rights and obligations

- In the revised regulation, third parties, including ESCOs, can access the ELHUB for customer data. This requires authorization (a power of attorney) by the customer prior to access. A power of attorney will be acquired via a consumer driven web application (a plug-in) that allows the consumer to access its own data and give authorization to third-parties to access their data. Via the suppliers' website, end-users (that are customers) will be able to control who has access to their data. Access to the hub, including third-parties, will require companies to sign a standard set of 'terms of use' and meet certain criteria such as legally established company with a firm address and contact person.

- Third-party access to consumer data (including by ESCOs) is possible in most Nordic countries. All countries require a 'power of attorney' as prior consent from the consumer. The format of this power of attorney differs greatly amongst the countries. Data-hubs allow for a more customer-driven consent format (a digital plug-in in which every consumer allocates access to third-parties) as is described in the proposed regulation of Denmark and Norway.

[1]Mapping of TSO and DSO roles and responsibilities related to information exchange

Elhub – rights and obligations

- NVE requested Statnett (TSO) to develop Elhub

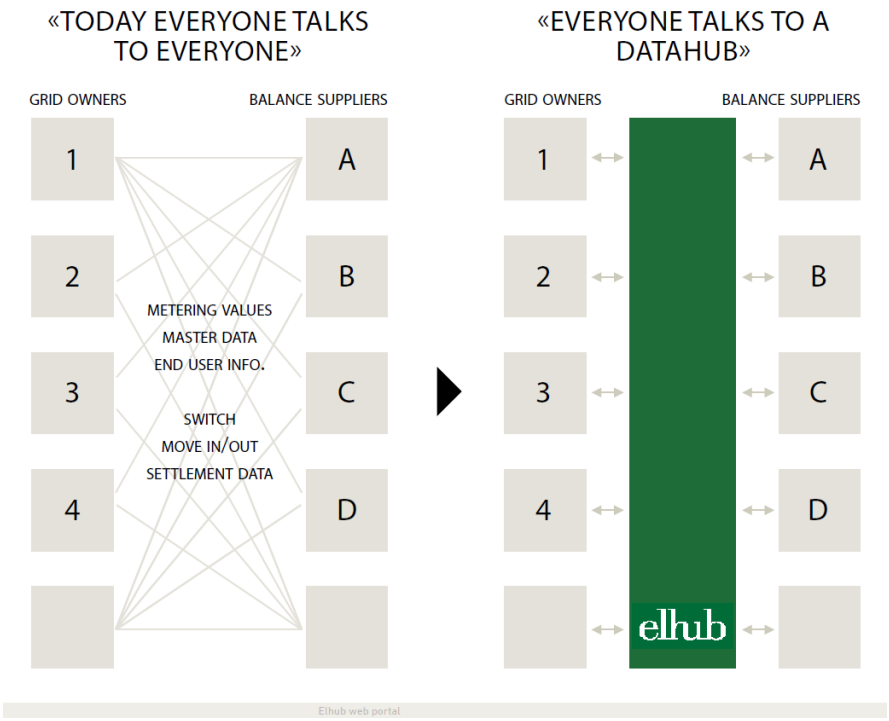
- A number of responsibilities that originally were allocated to DSOs have been transferred to the data-hub, or will be according to the outstanding proposals

- The Elhub will have historical data stored for (minimally) three years. Market actors (approx. 130 distribution grid companies and 110 suppliers) will have to transfer existing data to the Elhub.

[1]Mapping of TSO and DSO roles and responsibilities related to information exchange

Elhub – data hub in Norway

- It has now been adopted a new plan for the introduction of Elhub, which involves the startup (Go Live-date) of Elhub at October 23rd 2017.



Elhub's role – centralized data exchange platform

from elhub.no

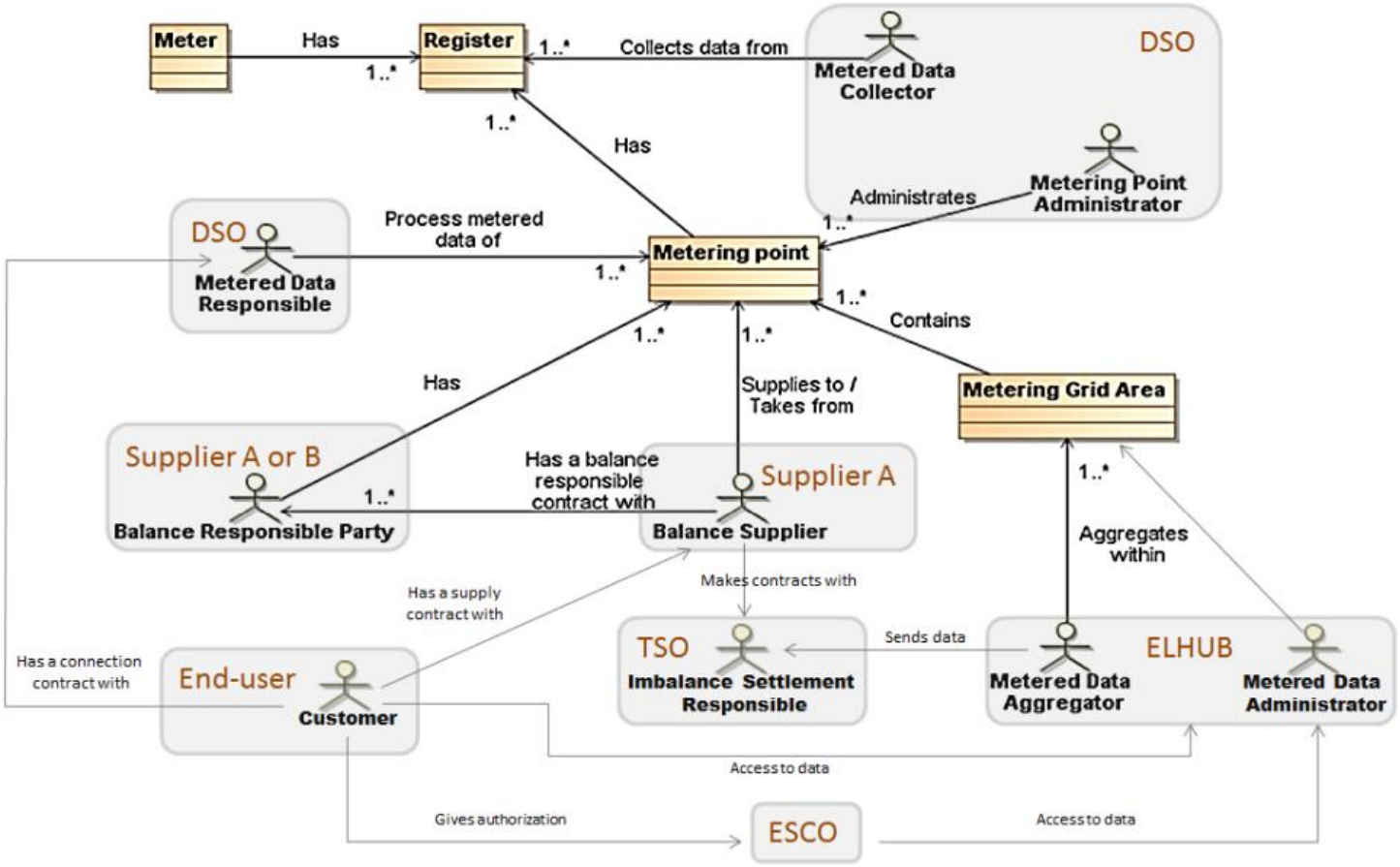
Costumer – rights and obligations

- In all countries, customers have access to their own data. It differs per country if it is the responsibility of the supplier or the DSO to provide the consumer this access. It depends mostly on the roll-out of smart meters what level of detail the consumption data is.

[1]Mapping of TSO and DSO roles and responsibilities related to information exchange

Overview of future situation

Figure 5: Revised Norwegian Electricity Market Role Model



Source: Draft based on the Nordic Harmonized Role Model (THEMA Consulting Group AS (NB this model serves for clarification purposes only and is not an official role model).

[1]Mapping of TSO and DSO roles and responsibilities related to information exchange

Data security

- Regulation and monitoring of data security is handled by Datatilsynet. With smart metering and the hub in place, the hub will also need to report to NVE on data security, including carrying out risk and vulnerability analysis.
- Data security, the protection of data against external threats, is in most cases the responsibility of the actor that is responsible for the data storage. This is the DSO or the data-hub (operator).

[1]Mapping of TSO and DSO roles and responsibilities related to information exchange

Proposal for a scenario

Includes:

- End user (Smart Home owner)
- Smart Meter, Home gateway
- ESCO (energy service) company's employee with access to sensitive data
- Competition between companies

A scenario involving threat to consumer's privacy

Sigurd (aged 32) works as an Energy Engineering Manager at an ESCO (energy service provider company) that provides a wide variety of energy saving solutions to its commercial and private clients. The company offers competitive wages, generous benefits, performance-based bonuses and a team-oriented, safety-conscious, drug-free environment for the employees. Sigurd's work involves determining customers' technical requirements, identifying and evaluating energy efficiency cost saving opportunities and gathering key project details such as utility data, facility profiles, site drawings, system characteristics. Sigurd has been working at the company for 5 years and feels that his work is highly valued by his superiors, and it contributes to his personal and professional growth. The company's main objectives fit very well with his ideas, he takes pleasure in recruiting new clients for the company for which he is compensated generously based on his performance.

Scenario (secondary use of aggregated data)

Sigurd gets an offer of NOK 100,000 in cash by a competitor on the market, in exchange for a comprehensive list of the company's current clients who are approaching the end of their contract period.

What's missing? Discussion

- TSO
- Electricity supplier
- Device capabilities
- …

- Possible improvements to include a wide range of actors/market roles/processes.

Connecting research to the scenario: Risk analysis

Case study based on Lyse

- Company has ~ 150,000 costumers
- All grid customers also receive a smart gateway by 1 January 2019
- Services include home automation, security and welfare services
- Uses Smartly Gateway

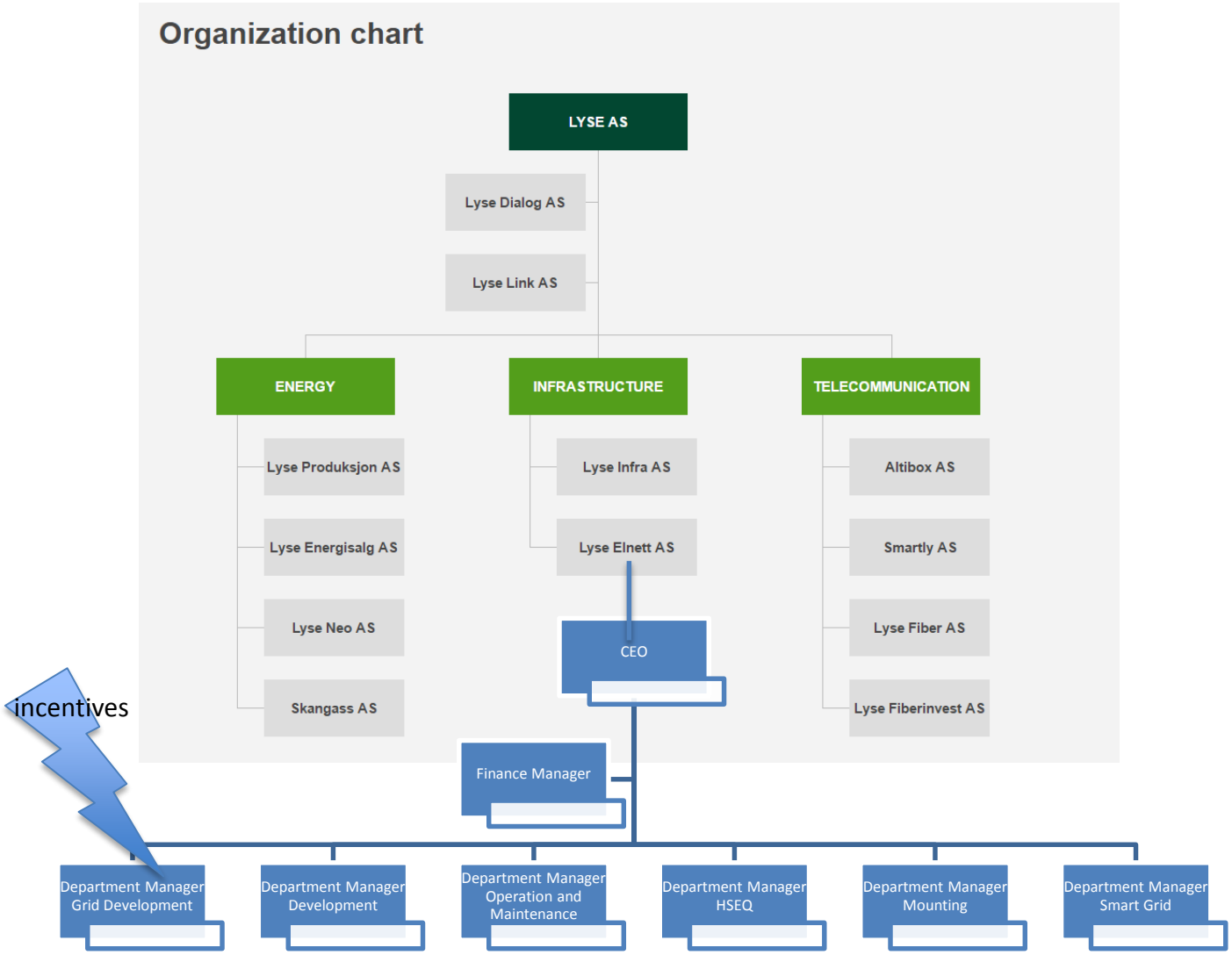
Hjernen i det smarte huset

En liten datamaskin (Smartly Gateway) monteres i boligens sikringsskap. Maskinen er koblet til internett, og kan trådløst styre boligens lys- og varmekilder, ventilasjon og smartdør.



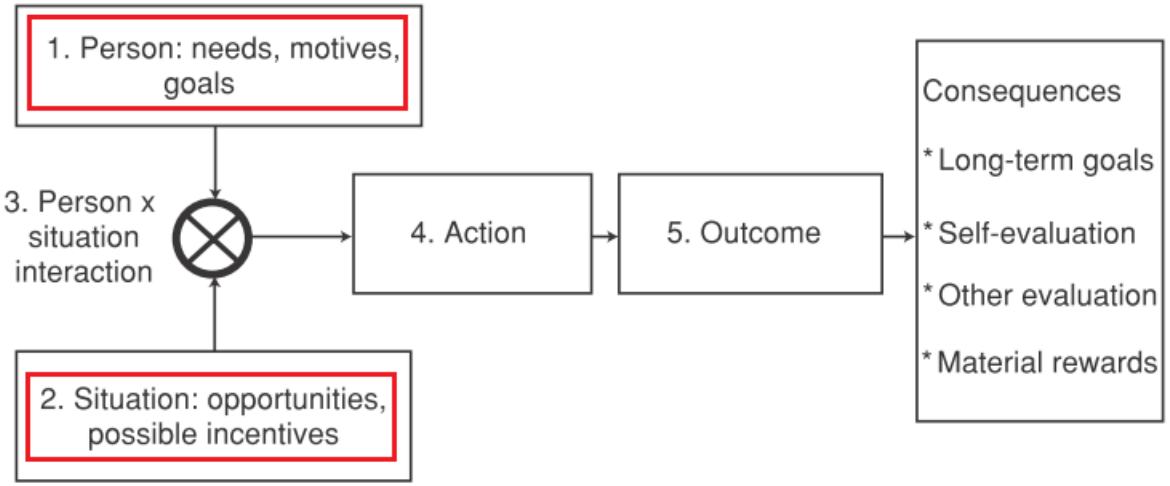
Capabilities:
-NorAlarm maintains a fully automatic fire and burglar alarm.
-Systemair residential ventilation can be controlled with Smartly.
-NorDan develops smart windows and doors. The keyless door unlocks with PIN code, RFID tag or from your smartphone or tablet.

Identifying the strategy owner



Determinants of motivated action

values,
attitudes,
personality dispositions



social culture,
org. climate,
incentives,
bonuses,
norms, etc.

2

[2] Heckhausen, H. (2012). *Motivation and action*. Springer Science & Business Media.

Key steps

1. Identify relevant literature/applicable theories
2. Quantify the “trustworthiness” of research results
3. Define and quantify relationships between psych. constructs
4. Apply knowledge on particular individual
5. Predict behavior