# CIRED Infotag 28.1.2014


## Bericht Session 6

## Electricity Market Place & Impact Regulation

ÖNC Berichterstatter: Struber Herwig

# CIRED 2013 – Session 6

## „Electricity Market Place & Impact of Regulation”

Inhalte der Session 6:

- *Neue Aufgaben und Herausforderungen für Verteilernetzbetreiber (Smart Metering, Smart Grids, Prosumer…)*
- *Auswirkungen auf Regulierung, Marktmodelle, Marktteilnehmer , und Kunden*
- *Spannende Diskussionen aufgrund unterschiedlicher Stakeholder*

# CIRED 2013 - Session 6

## „Electricity Market Place & Impact of Regulation“

- 4 Main Sessions (Block I – Block IV)
- 4 Round Tables (RT A – RT D)
- (geführte) Poster Sessions

Summe 80 akzeptierte Beiträge (1999: 31 / 2009: 79 / 2011: 85)

Chairman: Peter Söderström (Schweden)
Rapporteur: Ronald Liljegren (Schweden)
Rapporteur: Dag Eirik Nordgård (Norwegen)

# Themen der Session 6 - Main Sessions

- Block I: Activate the customer
- Block II: Regulation and market development
- Block III: More challenging DSO business
- Block IV: Smart grids projects

# Themen der Session 6 – Round Tables

- RT 6A – Future regulation for investmentes and development
- RT 6B – European Network codes – a new legislation for all actors
- RT 6C – Smart Girds experience and roadmaps internationally
- RT 6D – Customer behaviour and their electric appliances as a driver to smart homes and sustainable energy

# Auszug einiger Beiträge aus Block I bis Block IV

- Block I: Activate the customer
  - Beitrag aus Italien – Auswirkungen von Time of Use vs. Flat Rate Tarifen (pap. 0320)
  - Beitrag aus Norwegen - Demand Side Management (pap. 0377)
  - Neue Möglichkeiten & Services durch Smart Metering
    Bericht Vattenfall und Bericht Frankreich Linky Projekt (pap. 1282 u. 1333)
  - Bericht Schweden: Evaluation Methods for Market Models Used in Smart Grids (pap. 0800)

- Demand Side Management (DSM), what are the potential benefits (Norwegen pap 0377)

## What is DSM ?

NTE Statnett

| Jan A. Foosnæs, NTE Nett | Jan Ove Gjerde, Statnett |
|---|---|
| Erling Tønne, NTE Nett | Virginia Hyde, Statnett |

- **Demand side response**

  The customer responds to price signals

- **Demand side management**

  Management of demand flexibility

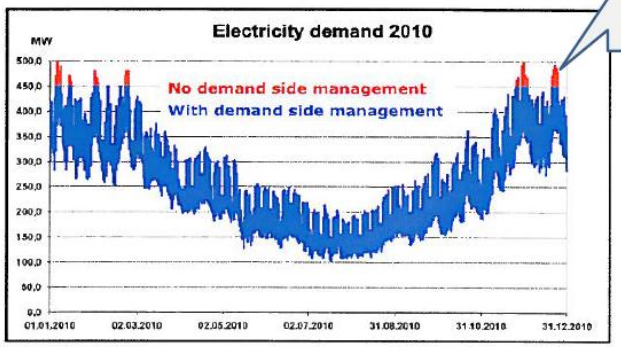
Typical flexible demand in Norway are:

- Electric boilers
- Water heaters
- Electric space heating

# Why DSM?

Benefit for the network (DSO and TSO) ?

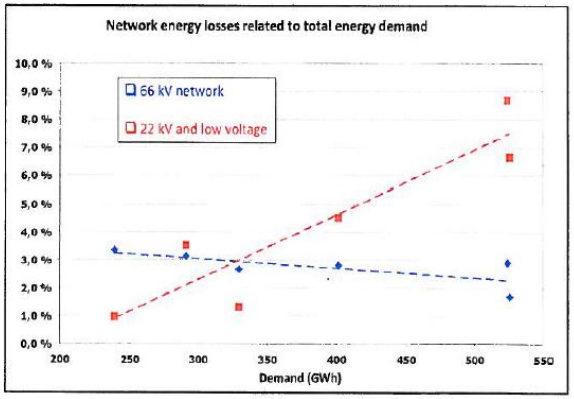
Benefit for the customer ?




Example: 10 % peak shaving

The energy loss reduction is only 0,6 %

Annual profile 2010 - Electricity demand - DSO level

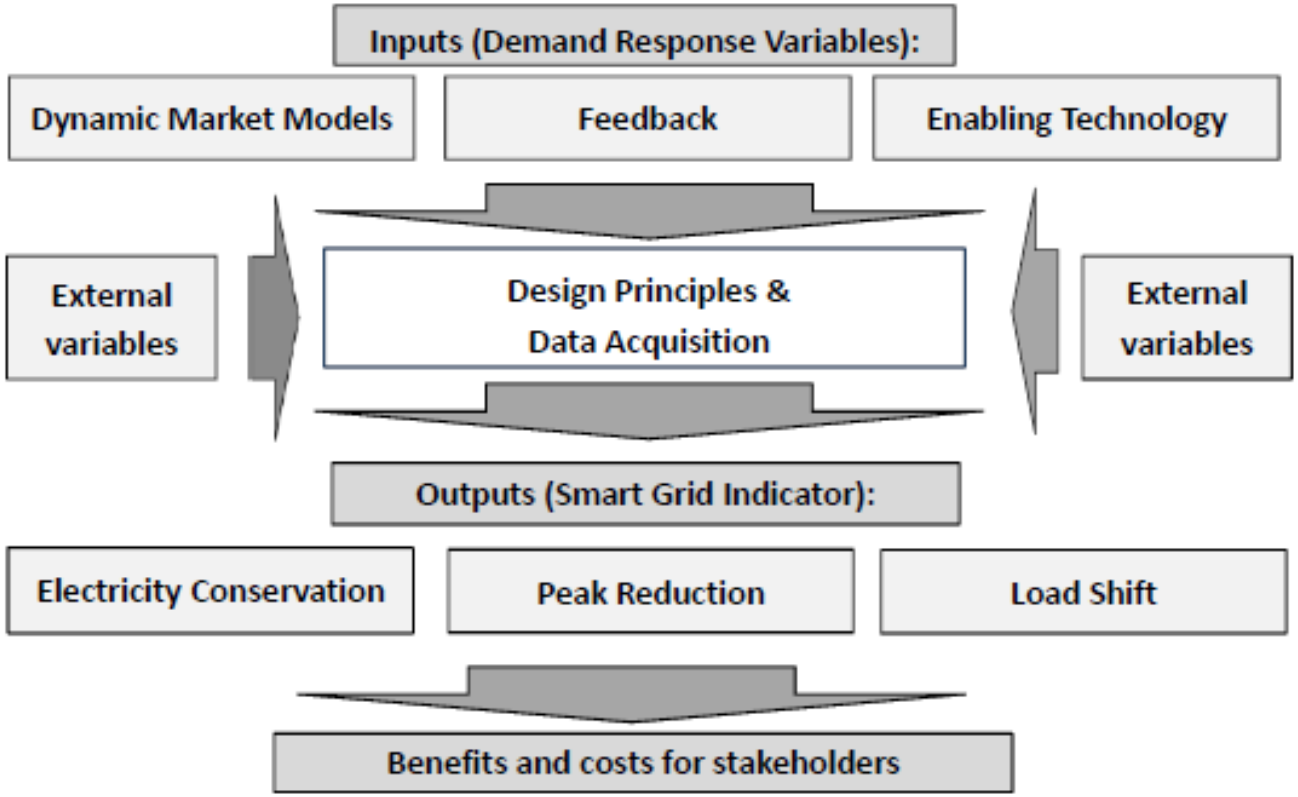



In some cases the network energy losses may increase when the load is reduced.

## Resümee

- Netzbedarfsprognose schwierig
- max. zeitl. Verzögerung bei Netzausbau durch DSM möglich
- Flex. Netztarife können/sollen DSM unterstützen

- Evaluation methods for market models in smart grids (Schweden, pap 0800)



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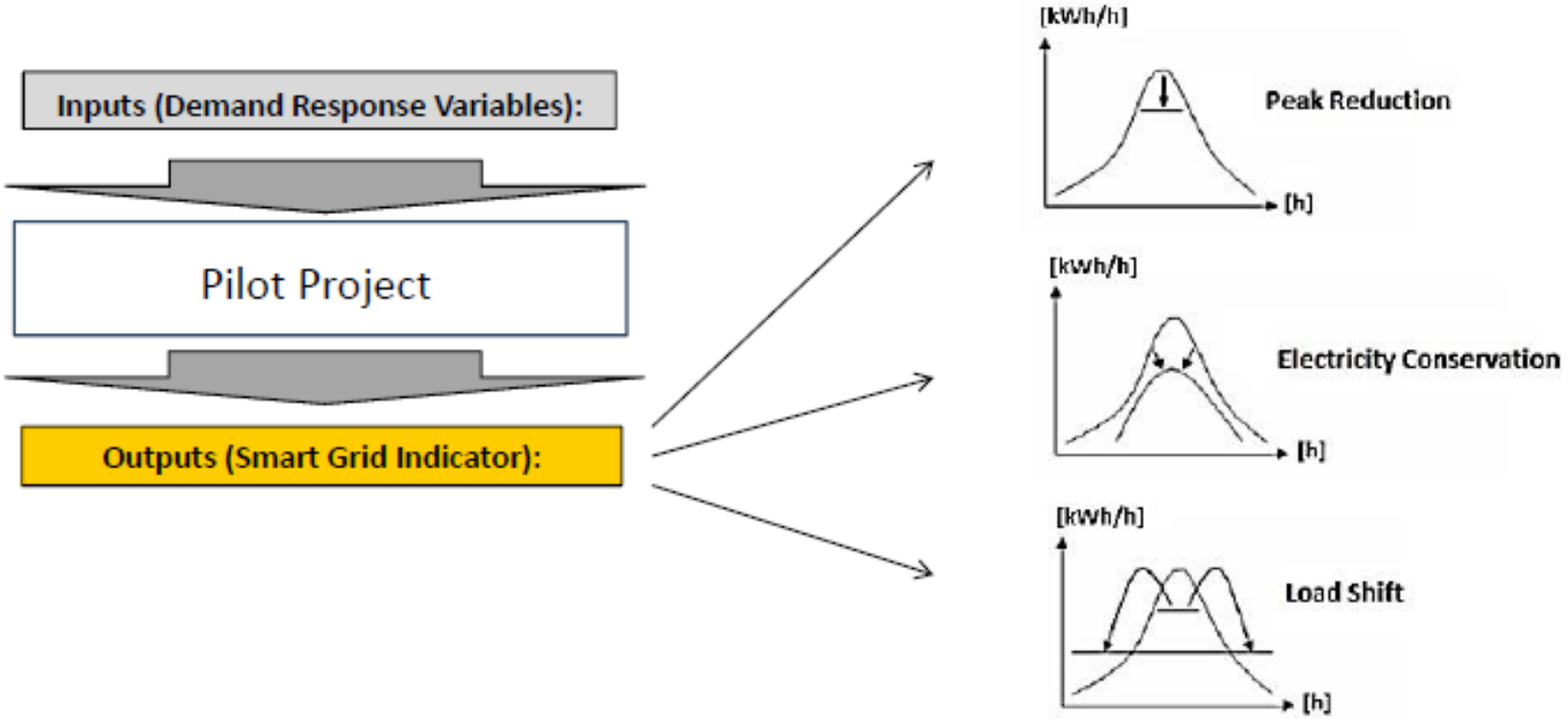

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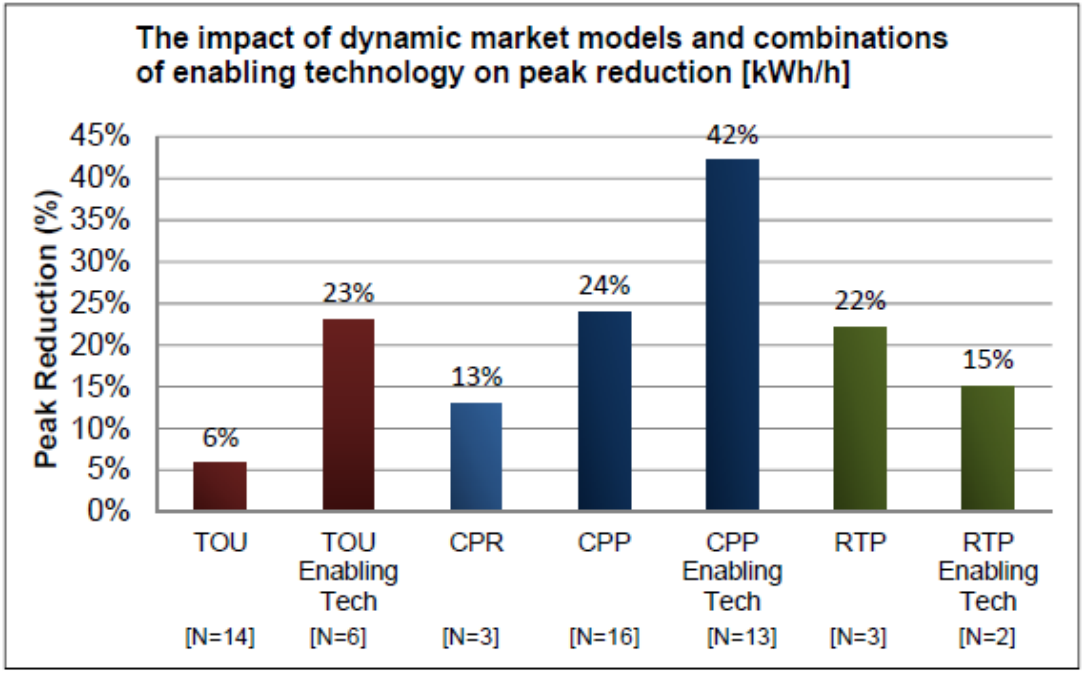
## 3. International Review of Pilot Projects – Peak Reduction




Peak Reduction in 55 of 57 projects

Hany Ibrahim, Mikael Skillbäck, Karin Alvehag, Olle Hansson – Sweden – Session 6 – Paper ID 0800

# Auszug einiger Beiträge aus Block I bis Block IV

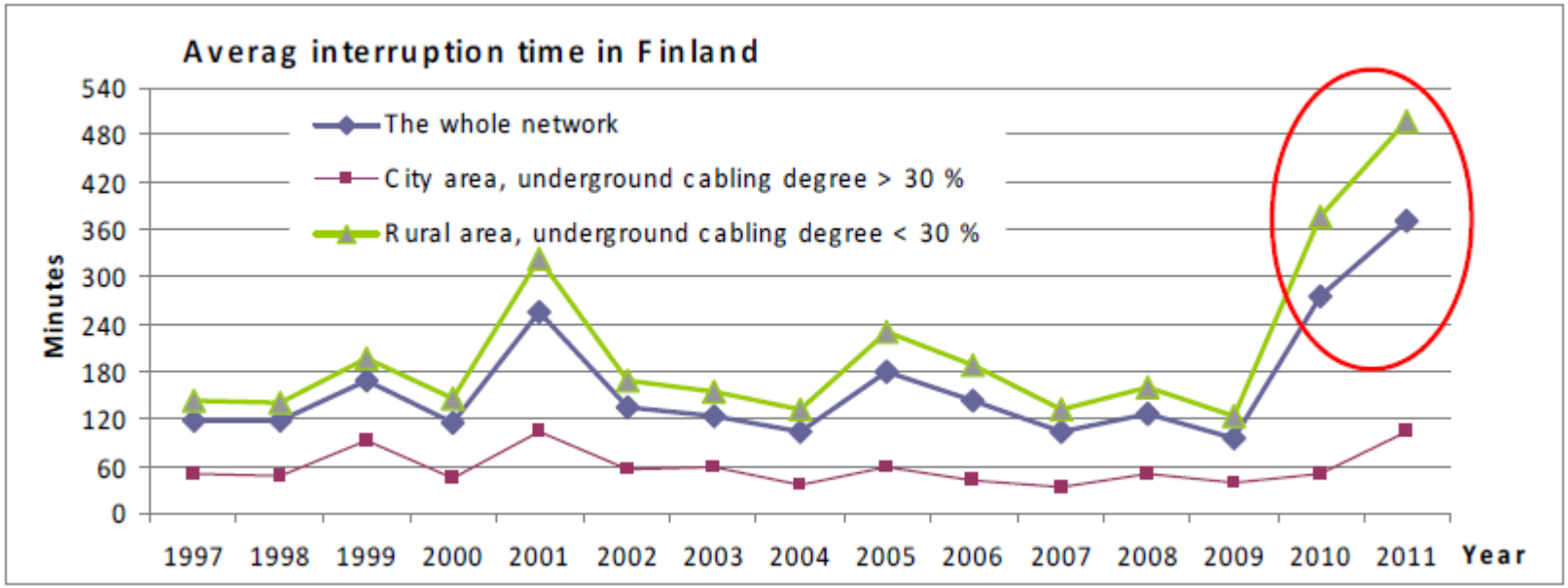
- **Block II: Regulation & Market Development**
  - Commercial quality regulation in European countries (Hungarian Energy Office pap. 0561)
  - Updating the security of supply level in the Finnish electricity distribution system (Ministry of Economy pap. 0511)
  - Impact of regulation on electric distribution market (USA pap. 0419)
  - Participation of photovoltaic systems in control reserve market (pap. 0245 Deutschland)

- Commercial quality regulation in European countries (Hungarian Energy Office pap. 0561)
  - CEER Bericht Quality of electricity supply (2001-2011)
  - Benchmarking Report: 29 countries of CEER + 9 NRAs
    - the availability of supply (*continuity of supply*)
    - its technical properties (*voltage quality*)
    - the speed and accuracy with which customer requests are handled (***commercial quality***).
  - Commercial quality = transactions between electricity companies (DSO, suppliers) and customers

# Commercial quality standards surveyed in the report

| | Commercial quality indicators | Standards (Median value and range) | Number of countries applying the indicator |
|---|---|---|---|
| CONNECTION | I.1 Time for response to customer claim for network connection | 16 days (range 8-30) | 11 |
| | I.2 Time for cost estimation for simple works | 14 days (range 5-35) | 14 |
| | I.3 Time for connecting new customers to the network | 11 days (range 2 wdays-18 weeks) | 16 |
| | I.4 Time for disconnection upon customer's request | 5 wdays (range 5-8) | 6 |
| CUSTOMER CARE | II.5 Punctuality of appointments with customers | 2.5 hours (range 0,5-4) | 11 |
| | II.6 Response time to customer complaints and enquiries (including 6a and 6b) | 15 days (range 5-40) | 11 |
| | II.6a Time for answering the voltage complaint | 18 days (range 5-60) | 11 |
| | II.6b Time for answering the interruption complaint | 15 days (range 7-21) | 7 |
| | II.7 Response time to questions in relation to costs and payments (excluding connection) | 13 days (range 5-40) | 9 |
| TECHNICAL SERVICE | III.8 Time between the date of the answer to the VQ complaint and the elimination of the problem | 6 months (range 1-24) | 6 |
| | III.9 Time until the start of the restoration of supply following failure of fuse of DSO | 4 hours (range 3-24) | 10 |
| | III.10 Time for giving information in advance of a planned interruption | 2 days (range 1-15) | 14 |
| | III.11 Time until the restoration of supply in case of unplanned interruption | 12 hours (range 1-24) | 13 |
| METERING and BILLING | IV.12 Time for meter inspection in case of meter failure | 10.5 days (range 3-30) | 9 |
| | IV.13 Time from notice to pay until disconnection | 15 days (range 8-28) | 7 |
| | IV.14 Time for restoration of power supply following disconnection due to non-payment | 3,71 days (range 1 day-8 wdays) | 11 |
| | IV.15 Yearly number of meter readings by the designated company | 1/year (range 0.33-365) | 12 |

- Updating the security of supply level in the Finnish electricity distribution system (Ministry of Economy pap. 0511)
  - Auslöser: Stürme im Jahr 2011, Ausfallsdauer bis zu 15 Tage



# Auszug einiger Beiträge aus Block I bis Block IV

- **Block III: More challenging DSO business**
  - Große inhaltliche Spreizung der eingereichten Beiträge – zukünftige Herausforderungen und Aufgaben im Verteilernetzgeschäft
  - Implementierung eines aktiven Netzmanagements
  - Auswirkungen Laststeuerung im Verteilernetz
  - Optimierung Asset Management im Verteilernetzgeschäft
  - Zusätzliche Benefits aus Smart Metering Roll Outs

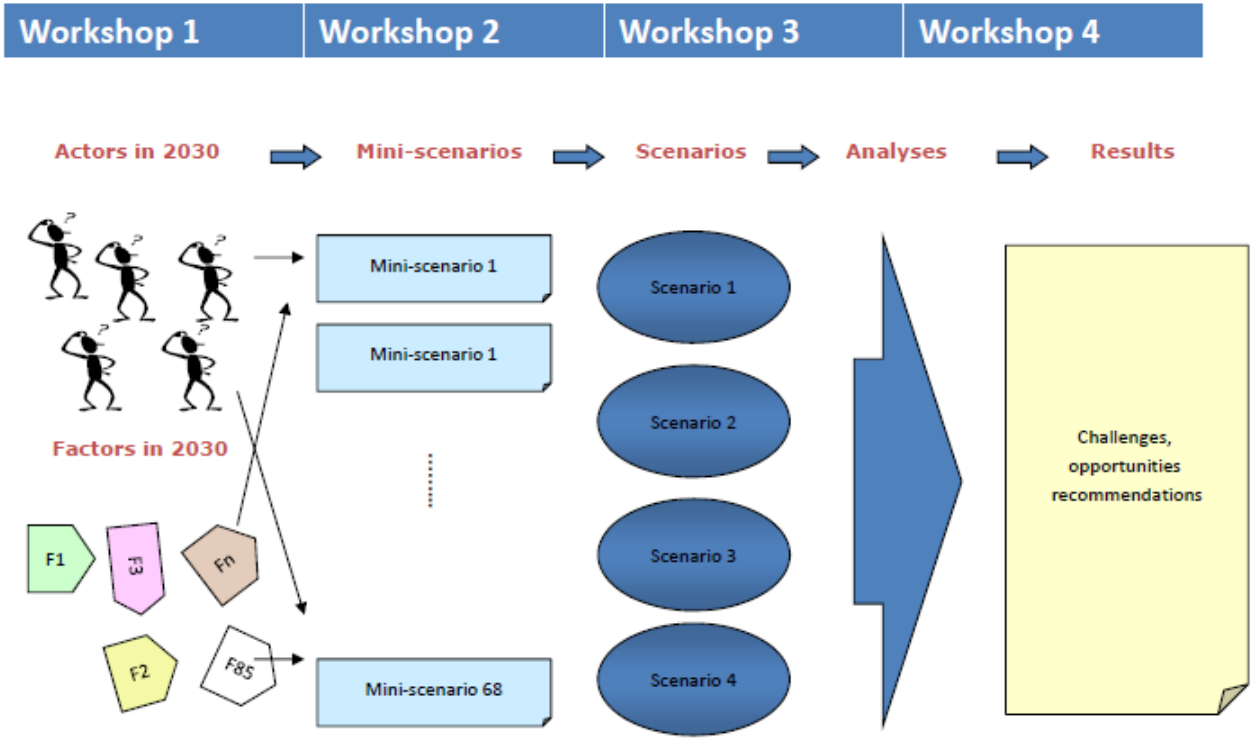
# Auszug einiger Beiträge aus Block I bis Block IV

- **Block III: More challenging DSO business**
  - Scenarios describing smart grid technologies applied to electricity distribution systems (SINTEF Norwegen, pap. 0314)
  - Impact of market-based residential load control on the distribution network business (Finnland pap. 1207)
  - Benefits from smart meter investments (Schweden, pap. 0613)
  - A model to optimise CAPEX and OPEX for a given quality level (Deutschland, pap. 0475)
  - Flexible plug and play low carbon networks: commercial solutions for active network management (UK, pap. 0768)

- Scenarios describing smart grid technologies applied to electricity distribution systems (SINTEF Norwegen, pap. 0314)
  - Projekt DeVID - Demonstration and Verification of Intelligent Distribution networks

    Ziel: demonstrate new smart grid technologies and methods for distribution networks
  - Fokus auf die Beschreibung von möglichen (nicht wahrscheinlichen), Szenarios im Jahr 2030) – 4 Szenarien untersucht
  - Zukünftige Anforderungen für das Verteilernetz ableiten

- Scenarios describing smart grid technologies applied to electricity distribution systems (SINTEF Norwegen, pap. 0314)



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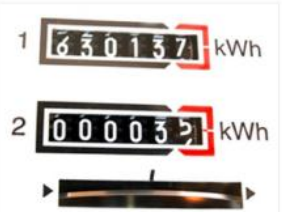


- Scenarios describing smart grid technologies applied to electricity distribution systems (SINTEF Norwegen, pap. 0314)
  - Extreme Wetterereignisse einplanen
  - Security Level festlegen
  - Echtzeit Monitoring für Netzautomatisierung einsetzen
  - Kundenverhalten und –anwendungen berücksichtigen (EV, passive Häuser…)
  - Aufbau von Smart Grids Kompentenzen

- Impact of market-based residential load control on the distribution network business (Finnland pap. 1207)
  - Ausgangslage Finnland 1980s

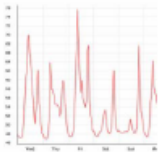
Over 30 000 houses under DLC (direct load control)

Wholesale tariff for peak powers 30 €/kW/year

100 MW controllable power → Savings for electricity utility 1.4 M€/year

- Impact of market-based residential load control on the distribution network business (Finnland pap. 1207)

**LOAD CONTROL**



driven by ***electricity market prices***

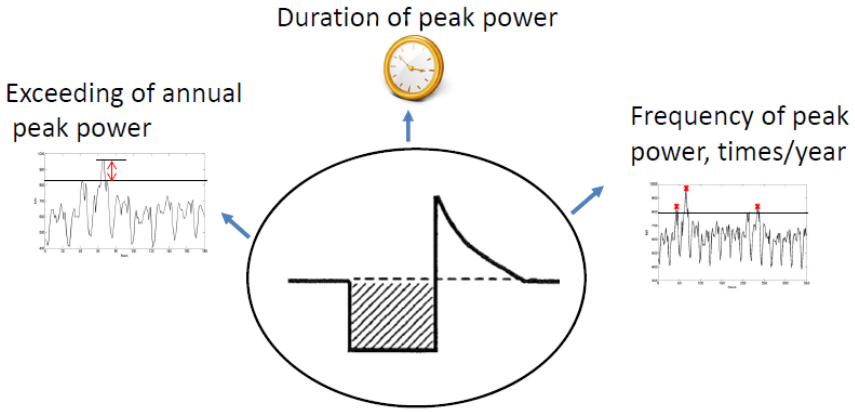
**Network impact?**

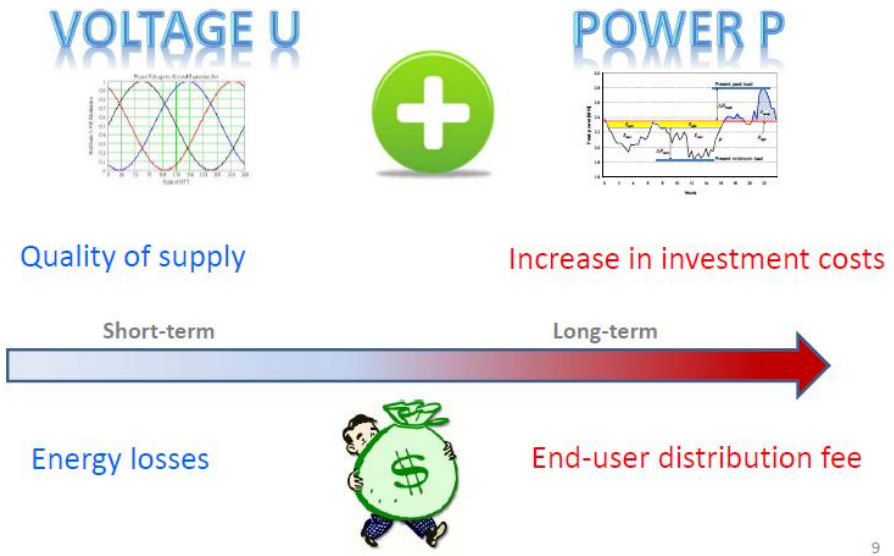
driven by ***electricity grid state***

- Frequency regulation
- Integration of renewables
- Peak cutting

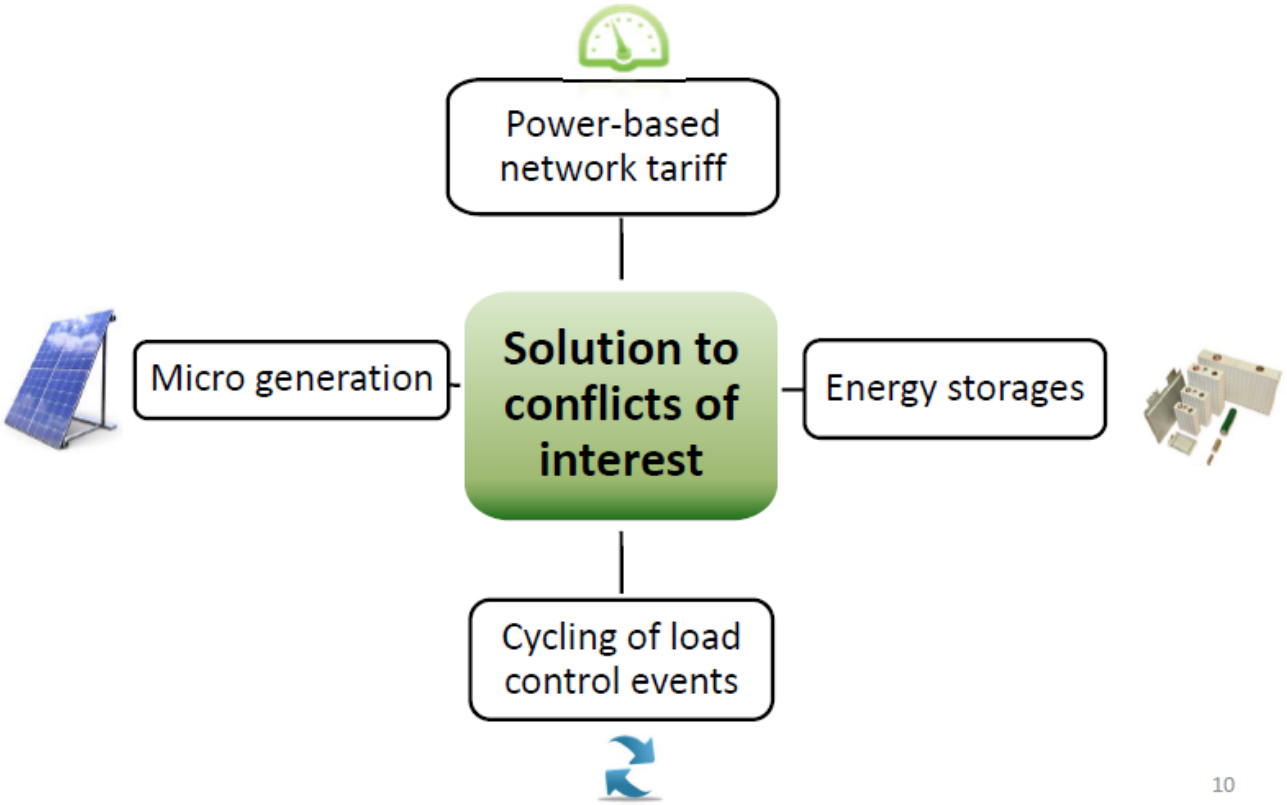
**Positive network impact**

- Impact of market-based residential load control on the distribution network business (Finnland pap. 1207)



- Impact of market-based residential load control on the distribution network business (Finnland pap. 1207)



- Benefits from smart meter investments (Schweden, pap. 0613)
  - Vattenfall 850.000 Smart Meter
  - Start Smart Meter Roll-Out im Jahr 2003
  - 3 Phasen des Roll Outs (mit unterschiedlichen Herstellern und unterschiedlichen Funktionalitäten)
    - AMR 1: Actaris 15%
    - AMR 2: Iscraemeco 15 %
    - AMR 3: Echelon/ Telvent 70 %
  - monatliche Rechnung seit Juli 2009

- Benefits from smart meter investments (Schweden, pap. 0613)

Purpose – evaluate BCs

| Business cases | Original - BC | Extended - BC | |
|---|---|---|---|
| | Implemented | | Evaluation/pilot |
| | Monthly billing | 0-faults | Detect wrong fuse size |
| | Move in/out | Power outage - compensation to customers | Optimize network losses - hourly values |
| | Supplier change | Remote switch off/on | Power outage - identify proactively |
| | Customer support | Presentation of daily/hourly values | Power outage - remaining faults and restoration |
| | Non-technical network losses | 0-faults | Power quality |
| | | | Network planning |

Method

| | 1 Meter capabilities | | 2 Financial benefits | 3 Non Financial benefits | | |
|---|---|---|---|---|---|---|
| Business case | AMR 1&2 | AMR 3 | Realized kEUR/a | Q&CSI | Env | Safety |
| Described business case | Needed Smart Meter functionality (NO if lacking) | | Realized value for BC | Estimated value (High/Medium/Low) | | |

- Benefits from smart meter investments (Schweden, pap. 0613)

- Upgrade AMR 1+2 empfehlenswert
- Umstellung auf stündliche Werte vorgesehen
- Quality & Customer Satisfaction
- Environmental Impact
- Safety
- Teilnahme an Smart Grids Projekten möglich

# Auszug einiger Beiträge aus Block I bis Block IV

- **Block IV: Smart Grids Projekts**
  - Analysis of the on-going research and demonstration efforts on smart grids in Europe (Italien, AIT Austria pap. 0836)
  - The meter-on projekt: how to support the development of advanced metering infrastructures in Europe? (CEIT Austria, pap. 1261)
  - InovGrid, a smart vision for a next generation distribution system (Portugal, pap. 0536)
  - Ecogrid EU projekt – real time price bases load control and economic benefits in a wind production based system (Norwegen, pap. 1474)
  - National scale impact of the Stockholm royal seaport projekt (Schweden, pap. 0914)

- Analysis of the on-going research and demonstration efforts on smart grids in Europe (Italien, AIT Austria pap. 0836)
  - Überblick über laufende Smart Grids Projekte und Forschungen in Europa (EEGI Roadmap 2010-2018)
  - Ziel ist es, einerseits einen Überblick über bereits behandelte Themen zu geben und andererseits offene Punkte / Themen zu identifizieren (Gap Analyse)
  - Arbeit erfolgt innerhalb der GRID+ Initiative, welche die European Electric Grid Initiative (EEGI) bzw. Strategic Energy Technology Plan (SET Plan) unterstützt

- The meter-on projekt: how to support the development of advanced metering infrastructures in Europe? (CEIT Austria,  pap. 1261)
  - Meter-On Projekt begleitet die Smart Meter Implementierung in Europa von 27 DSO in Europa
  - Meter-On Konsortium besteht aus:
    - EDSO (European Distribution Systems Operators for Smart Grids) A

- The meter-on projekt: how to support the development of advanced metering infrastructures in Europe? (CEIT Austria,  pap. 1261)

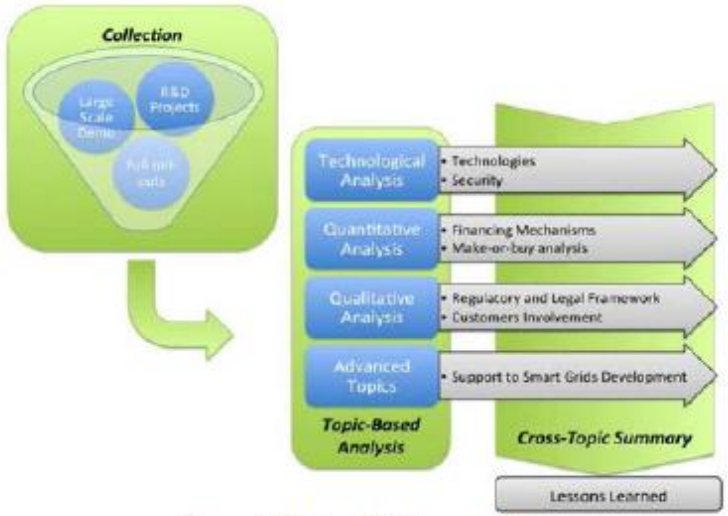
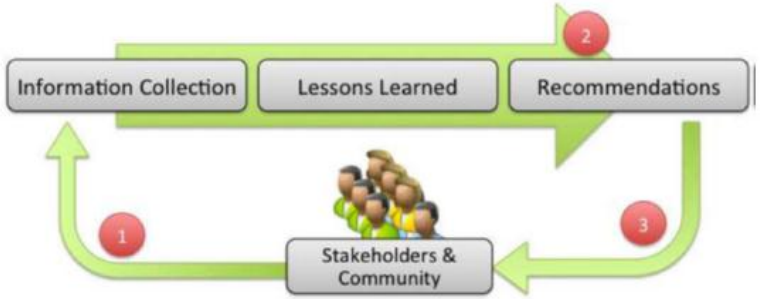



*Figure 1 Meter-ON Approach*



# Wie komme ich zu weiteren CIRED Infos?

- ex ante: Teilnahme an der CIRED Konferenz (Lyon 06/2015)
- ex post:
  - www.cired2013.org oder www.cired.net
  - CIRED Special Report
  - CIRED Executive Summary
  - CIRED Papers und Beiträge

- Österreichischen Nationalkomitee CIRED
  - e&i Zeitschrift nach der CIRED Konferenz
  - Besuch ÖNC Berichterstattung Wien, Innsbruck
  - Homepage www.cired.at
  - Kontaktierung der österr. Berichterstatter & CIRED Mitglieder
  - persönliches Engagement bei CIRED - Kontakt mit ÖNC aufnehmen

# Vielen Dank
# für die Aufmerksamkeit!

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