Examples of Data as a Service (DaaS) for Distributed Energy Resources

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EURISCO R&D & FlexGrid ApS

EURISCO RESEARCH & DEVELOPMENT

EURISCO ApS is an independent software development company.

We have more than 20 years of experience in software development both on embedded platform and on application level - from concept to prototype and final product.

- Software development
- Consulting for international standardization
- R&D projects

www.eurisco.dk

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FlexGrid can offer you data collection and data processing - as a service (DaaS)

'We take care of the technology and you can focus on the use of it'

- Electric Vehicle data logging
- CHPCOM tools and data management

www.flexgrid.dk

Agenda

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- Terms and definitions for ‘Data as a Service’
- Examples of DaaS
  - CHPCOM – FlexGrid IT-tools for DER
  - Electric Vehicles – data logging
  - European Transparency Platform – ENTSO-E
- DaaS for CITIES – cooperation wanted…

What is DER? – Distributed Energy Resources

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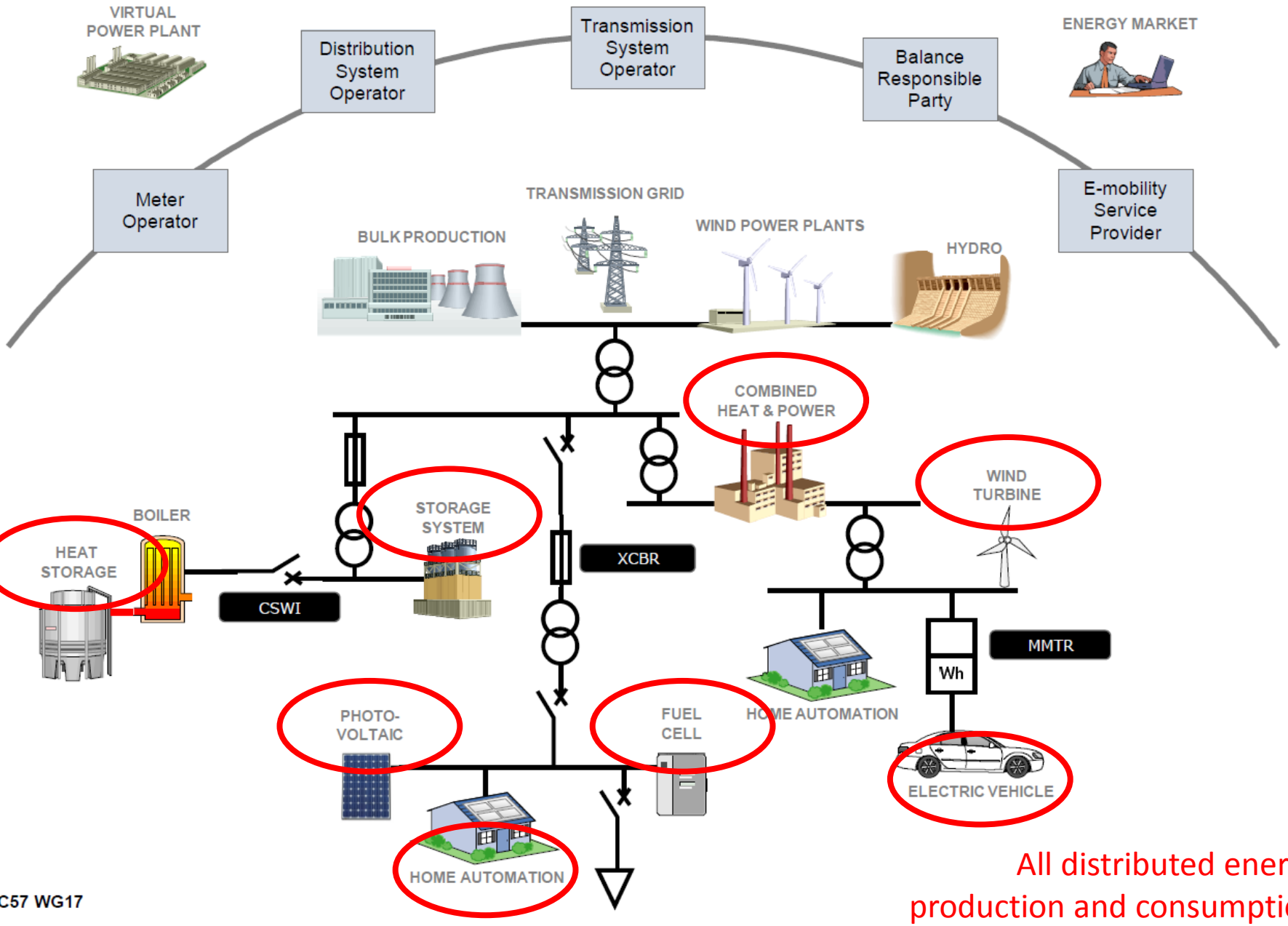

All distributed energy production and consumption

TC57 WG17

Definition of DaaS – Data as a Service

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Our definition of 'DaaS for DER':

'DaaS for DER' includes the concept of aggregating data from Distributed Energy Resources – as a Service

- Event triggered or polled data
- Status and Measurements
- (Set-points and Commands)
- Typical GPRS and TCP/IP based

- User management and Access Control
- Application Server and Database
- Data processing and filtering

- System integration
- GUI/HMI
- Export and reporting

Controlled Access is mandatory for 'Daas for DER'

- Organization
- Role
- AoR

The business model could typically be an annual access fee per customer and a monthly fee based on the services needed.

Who owns DaaS data?

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Terms and definitions according to FlexGrid:

Data responsible	Owner of field-device (DER)
Data administrator	DaaS owner and/or operator (FlexGrid)
Data user	Customer (paying for the DaaS – could also be the data responsible)

Our definition of data ownership is as follows:

As long as the data is attributable (directly or in-directly) to a specific field-device it is owned by the field-device owner, but if the data is neutral or aggregated with no traceability to the original host, it is 'free of use'

As long as data is attributable, it is up to the owner to give permission for other parties to use the data and for what purpose and for how long a period.

The owner of the field-device can delegate the 'data responsibility' to the data administrator through a 'Data Administration Agreement'.

Note: For details regarding personal data privacy, see the regulation from the national or European Data Protection Agency

Introduction to 3 practical concepts of DaaS

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✓ CHPCOM – FlexGrid IT-tools for DER

The scope of the CHPCOM project is to develop and test an ICT solution for the future Danish energy system. The ICT solution should be based on international standards for Distributed Energy Resources, to support data communication between Combined Heat and Power plants – and the operators of the energy system.
www.chpcom.dk

✓ Electric Vehicles – data logging

Movia runs tests on electrical BYD busses for CityTrafik and Arriva, and for that purpose a special system for data collection has been developed by FlexGrid ApS
http://www.moviatrafik.dk/miljoe/miljoearbejdet/busserne/forsoegmedelbusser/Pages/forsoeg-med-elbusser.aspx

✓ European Transparency Platform – ENTSO-E

The Commission Regulation (EU) No 543/2013 of 14 June 2013 on submission and publication of data in electricity markets makes European electricity market information more precise and comparable. It will become mandatory for each TSO to submit fundamental information related to generation, load, transmission and electricity balancing which ENTSO-E will publish on a future central information transparency platform.
https://www.entsoe.eu/data/entso-e-transparency-platform/Pages/default.aspx

CHPCOM FlexGrid IT-tools

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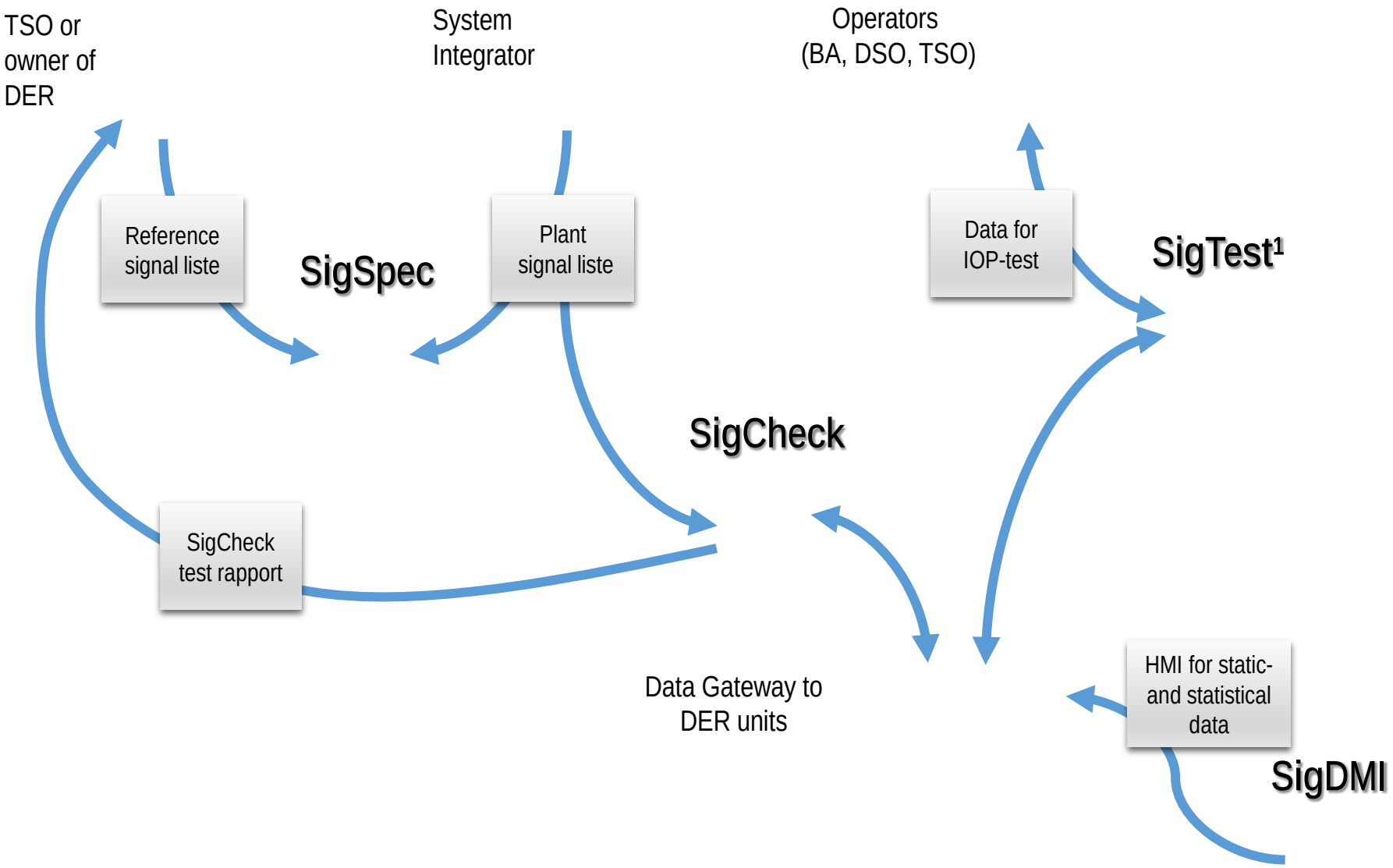

CHPCOM

[1] under development

CHPCOM FlexGrid IT-tools

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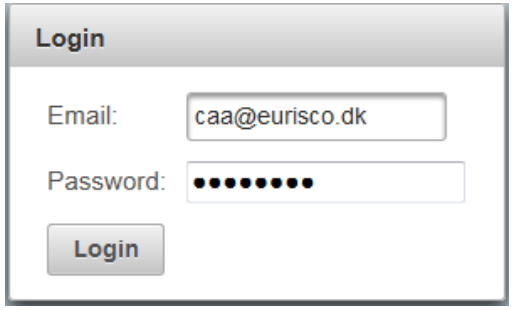

https://sigspec.flexgrid.dk

Id	Name	Description	Interact
EIC45W0000000000013	Skagen Varmeværk a.m.b.a.		View signal lists
EIC45W0000000000021	Brædstrup Fjernvarme a.m.b.a.		View signal lists
EIC45W000000000004Y	Ribe Fjernvarme amba		View signal lists
EIC45W000000000005W	KARA/NOVEREN		View signal lists
EIC45W000000000006U	Helsinge Fjernvarme A.m.b.a.		View signal lists
EIC45W000000000007S	Sæby Varmeværk a.m.b.a.		View signal lists
EIC45W000000000008Q	Bjerringbro Varmeværk A.m.b.a.		View signal lists
EIC45W00000000000EU	Eurisco Kodeværk	Værk for brug ved tests	View signal lists

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CHPCOM FlexGrid IT-tools

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- Plant signal lists
- Reference signal lists
- User Management

Status	Name	Description	Editor comment	Created	Modified	Interact
Open by Jacob Dall @ 2014-05-09 19:20:27	Version 1			2014-04-14 09:16:10	2014-05-09 19:17:14 by Jacob Dall	View list
Released by Thomas Saabye @ 2014-07-04 15:10:15	Version 2.3			2014-05-07 12:22:48	2014-12-04 15:03:09 by Thomas Saabye	View list
Open by Thomas Saabye @ 2014-11-17 09:44:53	Schedules only	This is only for schedules		2014-11-17 09:44:53	2014-11-21 10:20:39 by Philip Douglass	View list

Type	Id	Name	Description	Symbol	Unit	M/O	Comment	Reference	61850 Tag	61850 Comment	
Målinger/beregninger (output)		Budpriser	Schedule		(dimensionless)	O			AF/DSCH1.SchdAbsTm		View
Målinger/beregninger (output)		Varmeprognose	Schedule		(dimensionless)	O			AF/DSCH2.SchdAbsTm		View
Målinger/beregninger (output)		Varmelagerprognose	Schedule		(dimensionless)	O			AF/DSCH3.SchdAbsTm		View
Målinger/beregninger (output)		Varme fra ekstern produktion			MWh	O		PUDDEL	AF/MHET1.HeatIn.mag.f	Ny DO - type MV	View
Målinger/beregninger (output)		Fjernvarmeproduktion	Aktuel varmeproduktion ab værk i MJ pr. sek.		MJ/s	M			AF/MHET1.HeatOut.mag.f		View
Indstillinger (input)		Varmeplan	Schedule		(dimensionless)	O			AF/DSCH4.SchdAbsTm		View

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Plant: [redacted] **Fjernvarme A.m.b.a.**
Plant signal list: V1 [Status: Work in progress by [redacted] (Last modified at 2014-12-05 13:22:14 by [redacted]
SigCheck summary
All signals found
Number of signals: 480
Number of signals found on IEC Server: 480 (100%)
Number of signals not found on IEC Server: 0 (0%)
Check was done at: 2014-12-08 09:53:45
Connection Info
IP address: [redacted]
Port: 102
Remote AP Title: 1.1.999.1.1
Local AP Title: 1.1.999.1
Remote AE Qualifier: 12
Local AE Qualifier: 12
Remote S-SEL: 0001
Local S-SEL: 0001
Remote P-SEL: 00000001
Local P-SEL: 00000001
Remote T-SEL: 0001
Local T-SEL: 0001
Max T-PDU Size: 10

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Electric Vehicles – data logging

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movia

Logout, admin

FlexGrid – a simple solution to a complex problem

- Reports
- Trip logs
- User Management

Reports

Bus: Arriva

Monthly reports | **Daily reports** | **Notes**

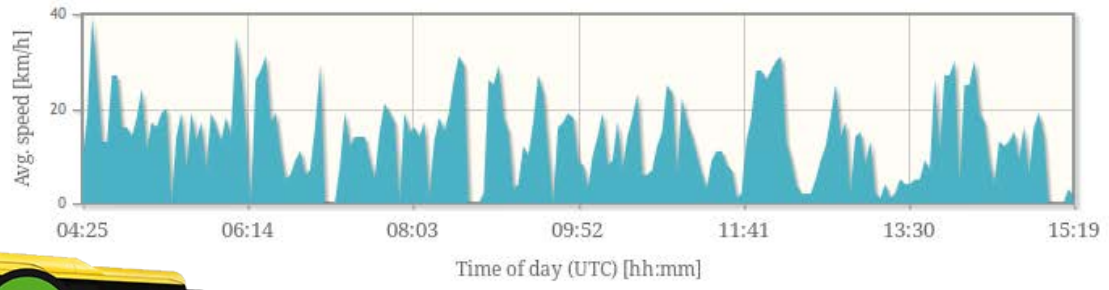
2014-09 | 5

Daily overview

	Driving speed [km/h]	Energy consumption [kWh/km]	Outside temperature [°C]
Min	0.0	1.4	15.2
Max	62.9	4.3	31.0
Avg	13.5	2.6	23.7

	State of Charge [%]	Odometer [km]	Range driven [km]	Total energy consumption [kWh]
Start day	100	16313.8	-	-
End day	48	16461.6	147.8	383.2

Trip: 04:24:32 - 15:20:44



Trip summary

Distance:	147.8 km
Energy cons.:	383.2 kWh
Avg. speed:	13.5 km/h
Avg. external temp:	23.7 °C
SoC (Start - End):	100 - 48%

European Transparency Platform from ENTSO-E

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Reliable Sustainable Connected

ENTSO-E continues its commitment to the transparency of European electricity market information through the development of the new Central Information Transparency Platform, which was launched on 5 January 2015.

This redesign and major upgrade of the existing transparency platform will comply with Regulation (EU) No. 543/2013 on submission and publication of data in electricity markets and will provide information free of charge which will help to create a level playing field between market participants, reducing the scope for any abuse of market power and ultimately benefiting the implementation of the Internal Energy Market.

https://transparency.entsoe.eu

European Transparency Platform from ENTSO-E

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Load | Generation | Transmission | Balancing | Outages | Congestion Management | Data Pre-5.1.15

Total Load - Day Ahead / Actual | Total Load Forecast - Week Ahead | Total Load Forecast - Month Ahead | Total Load Forecast - Year Ahead | Forecast Margin - Year Ahead

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Total Load - Day Ahead / Actual

Actual Total Load [6.1.A]
Day-ahead Total Load Forecast [6.1.B]

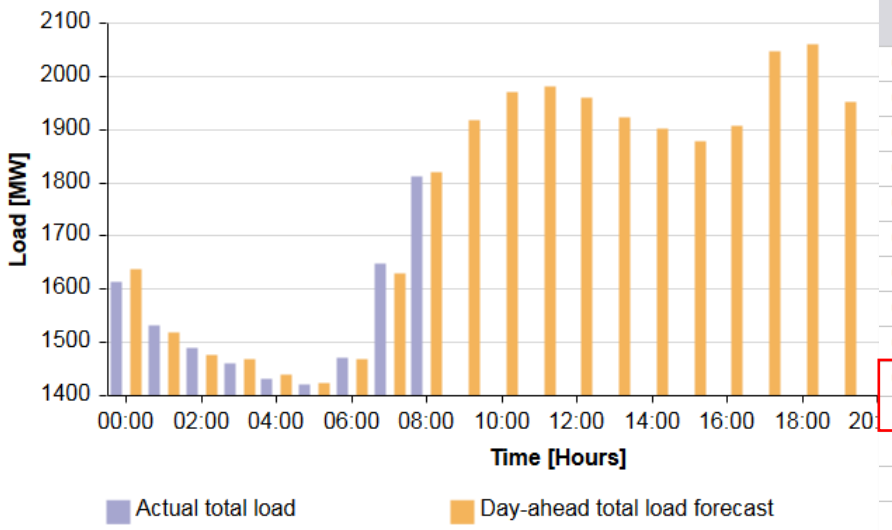
Control area | Bidding zone | Country

Day 24.05.2015

Area

- Denmark (DK)
- BZN|DK1
- BZN|DK2
- Estonia (EE)
- Finland (FI)
- France (FR)
- Germany (DE)
- Greece (GR)
- Hungary (HU)
- Ireland (IE)
- Italy (IT)
- Latvia (LV)
- Lithuania (LT)
- Luxembourg (LU)
- Macedonia (MK)

CET (UTC+1) / CEST (UTC+2)



Time	BZN|DK1 Day-ahead Total Load Forecast [MW]
00:00 - 01:00	1639
01:00 - 02:00	1520
02:00 - 03:00	1477
03:00 - 04:00	1468
04:00 - 05:00	1439
05:00 - 06:00	1424
06:00 - 07:00	1469
07:00 - 08:00	1629
08:00 - 09:00	1821
09:00 - 10:00	1918
10:00 - 11:00	1971
11:00 - 12:00	1980
12:00 - 13:00	1960
13:00 - 14:00	1924

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Load | Generation | Transmission | Balancing | Outages | Congestion Management | Data Pre-5.1.15

Total Load - Day Ahead / Actual | Total Load Forecast - Week Ahead | Total Load Forecast - Month Ahead | Total Load Forecast - Year Ahead | Forecast Margin - Year Ahead

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Total Load - Day Ahead / Actual

Actual Total Load [6.1.A]
Day-ahead Total Load Forecast [6.1.B]

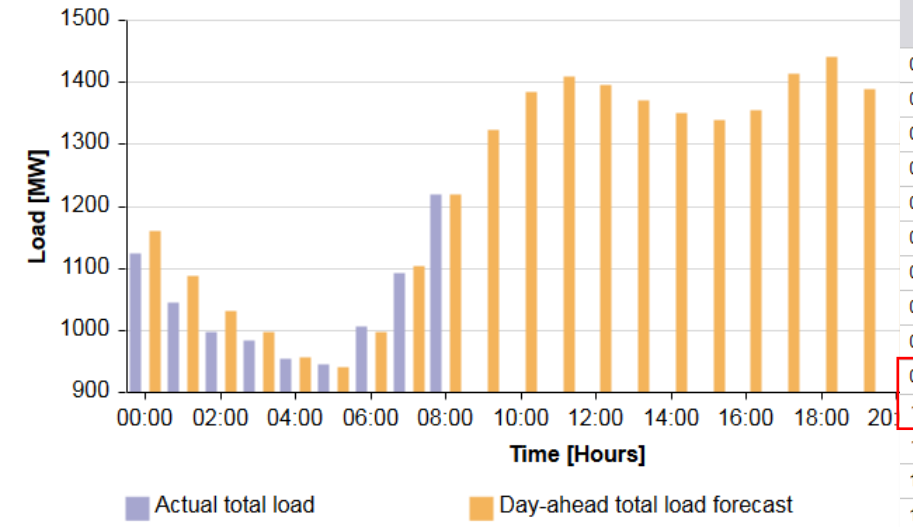
Control area | Bidding zone | Country

Day: 24.05.2015

Area

- Denmark (DK)
  - BZN|DK1
  - BZN|DK2
- Estonia (EE)
- Finland (FI)
- France (FR)
- Germany (DE)
- Greece (GR)
- Hungary (HU)
- Ireland (IE)
- Italy (IT)
- Latvia (LV)
- Lithuania (LT)
- Luxembourg (LU)
- Macedonia (MK)

CET (UTC+1) / CEST (UTC+2)



Time	BZN|DK2 Day-ahead Total Load Forecast [MW]
00:00 - 01:00	1160
01:00 - 02:00	1087
02:00 - 03:00	1031
03:00 - 04:00	997
04:00 - 05:00	957
05:00 - 06:00	941
06:00 - 07:00	998
07:00 - 08:00	1104
08:00 - 09:00	1219
09:00 - 10:00	1323
10:00 - 11:00	1385
11:00 - 12:00	1410
12:00 - 13:00	1396
13:00 - 14:00	1372

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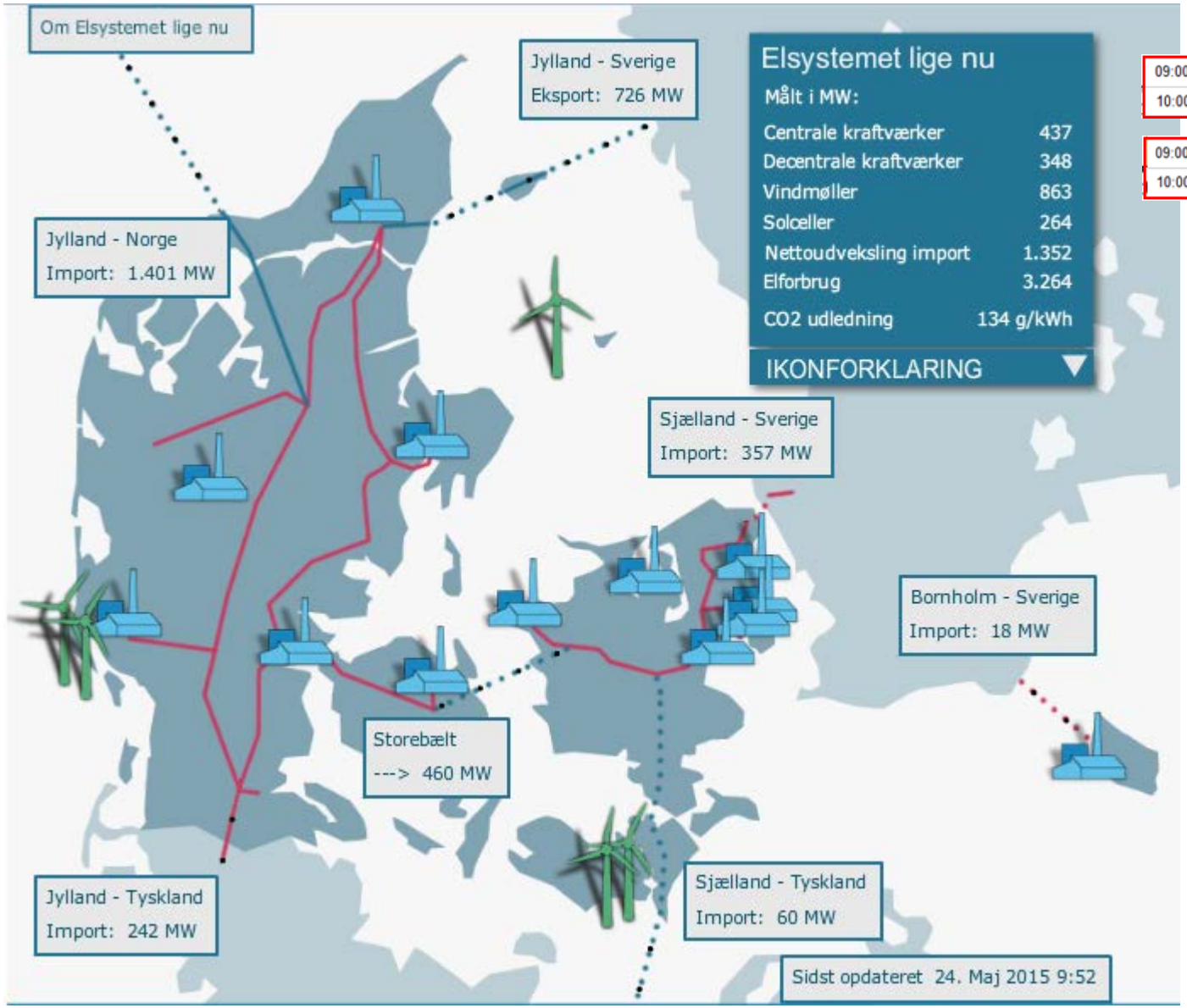
ENERGINET.DK



09:00 - 10:00	1918
10:00 - 11:00	1971

09:00 - 10:00	1323
10:00 - 11:00	1385

Transparency Platform Forecast consumption DK1+DK2

1.945 MW
1.354 MW
3.299 MW

CITIES cooperation wanted - DaaS for DER prototypes

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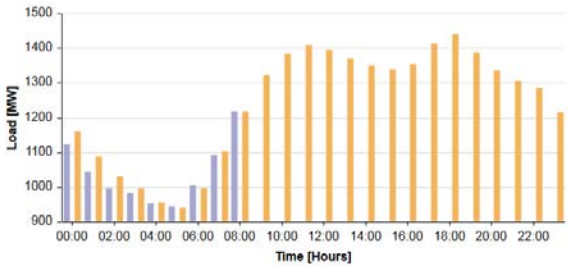
Data Analyses



DaaS for DER

Data Acquisition

http://www.gsmcontrolsystem.com
Just an example…

CITIES cooperation wanted - DaaS for DER prototypes

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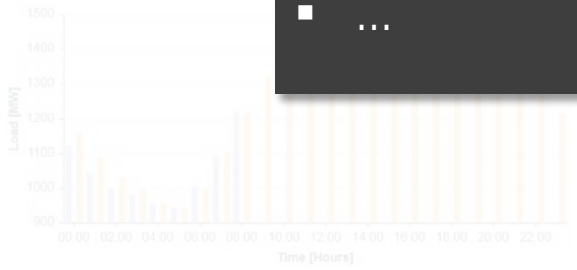
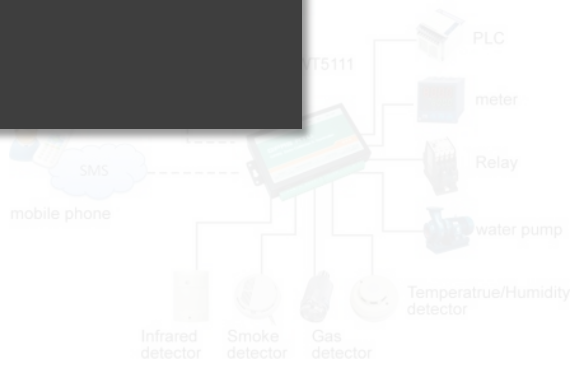
- Transparency Platform for CITIES
- Collection of sensor data from WiFi hotspots for trafic management
- Data management for DR+ in summer houses
- Datahub for District Heating combined with DR from CHP and DER
- …





http://www.gsmcontrolsystem.com
Just an example…