

# Interim report – WP2 Data and Measurements

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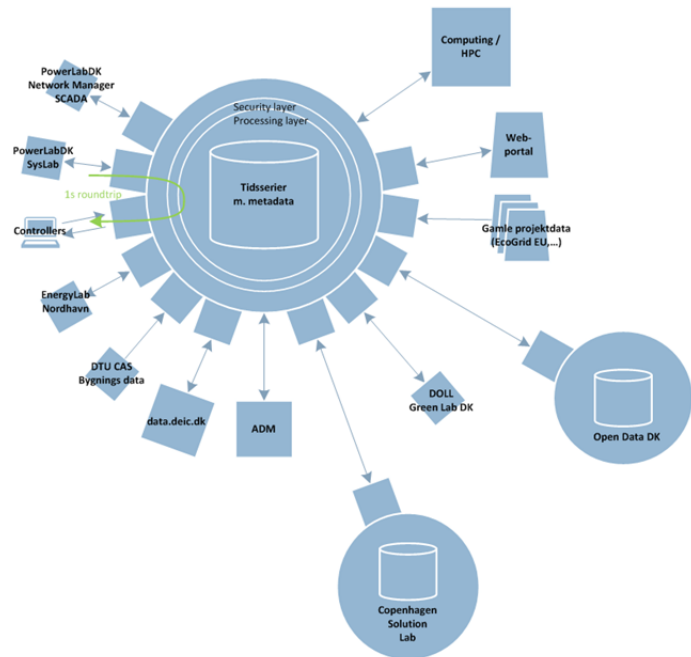
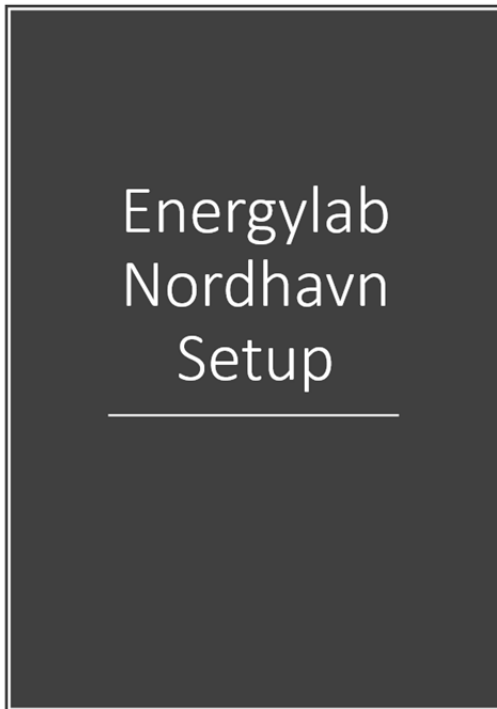
Reporting months: July 2017 – June 2018



Photo: By & Havn / Ole Malling

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ABB A/S  
June 2018

## Overall progress of the work towards WP Objectives



The Data Management System (DMS) is now in operation and the interfaces are in place for most installations, a plan for the rest is in place. META Data are still missing but work is in progress and a simple way to add META data is in place. It is expected to have the backup solution for MEA data in place before 1 July, solution and details are agreed by all parties.

Data validation and monitoring of interfaces are still not in place but a person has been allocated to the task and work is in progress. End-to-End test between KNX apartments and Uptime IT/DMS has been carried out.

Data from the weather station at CIS has been validated and observed measurements seem to be within expected values.

GDPR for all users within the ELN project and DMS data are in place. Agreements of consent from apartments are all handled by DTU legal.

Sundmolehusene are connected and data is received.

HOFOR is now connected to DMS by sFTP (network protocol used for secure file transfer) and data flow is being tested.

Radius is now connected to DMS by sFTP but data is still being negotiated.

CleanCharge is connected and data received into DMS.

NordPool electricity prices are received into DMS.

Agreement regarding weather data from MeteoBlue has been signed and data is now being received into DMS.

Agreement with Tmrow regarding live data on electricity grids Co<sub>2</sub> mixfuel and weather prognoses for wind production is in place.

## Status and activities in the WP tasks

### Task 2.1: Measurement specifications

Rapport Legal part (GDPR - Person data/Person sensitive) MOHC – Report is finalized and approved

Rapport Sikkerhedsbekendtgørelsen ANKR – Waiting for completion

Rapport Cyber Security BSTH – Waiting for completion

DMS status:

The following are being loaded into DMS as of today:

Data from selected KNX installations

Data from SGU (IEC 60870-5-104 protocol)

Nordpool prices

CleanCharge (EV charging)

HOFOR

Danfoss Heat Booster

Data from MeteoBlue

The following is expected to be operational within 1-2 weeks:

Radius (for selected installations - all about 1500 Kamstrup electricity meters)

The following are expected to be implemented before 1 July:

Data from Tmrow (CO2 data)

Data from battery

### Task 2.2: Electricity grids measurements

BESS measurements have been sent to DTU as planned. Values are logged every second. Values are sent, when a new value varies with a given value from the previous one.

GRID measurements have been sent to DTU as planned. Values are logged every second. Values are sent, when a new value varies with a given value from the previous one.

### Task 2.3: Individual meters

Available Remote Power Meters (RPM) measurements (Kamstrup remotely read power meters, not to be mistaken for the old version 'Revolutions per minute') have been delivered until 1 May. However, it is not possible to get measurements from all installations in 2150 Nordhavn area, before the project ends in 2019, due to the fact that not all meters in the area will be RPM before the end of 2019.

Initially we focus on Århusgade area, Sundmolen and Levantkaj. We are in close dialog with the RPM roll out project including Kamstrup. Some meters are still not RPM, some meters are RPM but the underlying system is not enabled. We expect this underlying

system to be enabled for all installed RPM by the end of July 2018. As new measurements are activated, they will be sent.

Time resolution for RPM measurements is one hour.

RPM data will be sent once every month to DTU ftp-server. Data will be sent manually.

#### **Task 2.4: Thermal grids measurements**

HOFOR has provided a list of installations and meter numbers for heat meters in the EnergyLab Nordhavn area - there is a supply address attached to them in DMS for mapping reasons.

HOFOR has sent test files in a csv format over the last month. The purpose is to test heat meters, water meters and temperature sensors. It has been agreed with DTU to share the files in

categories so heat meter files are sent in a single file every day, water meters (if necessary) will come later in their own files as well as separate temperature files.

It has been tested that Uptime IT can read temperature meters.

The data upload from HOFOR is set to run automatically daily from the end of week 19.

#### **Task 2.5: Building measurements**

During the last year reliable data collection from the last apartments in Sundmolehusene has been established. The installations have been completed and commissioned and residents have moved in.

There is no system established for validating data collection in DMS.

Data from Frihavnstårnet has been attempted to validate models in WP3 - but the data quality is not sufficient to be used. Therefore, pure simulation has been used in this work.

The systematic troubleshooting work on data collection is expected to start in week 22, Uptime IT, ABB and DTU will conduct excavation-testing end-to-end of the entire signal path and compare with ETS5 values. However, all data points will not be tested.

There is a wish to measure on the decentralized ventilation collection from Sundmolehusene from DTU Byg. A solution may be established where existing KNX systems are used.

Data collection from CIS has started and data from ELN's weather station is as expected. Solar systems are not in operation due to issues with harmonic noise from either the inverters at the solar system or LED light sources. Investigations are ongoing.

The network to collect data from KNX installations and concrete temperature sensors is setup as shown in figure 1.

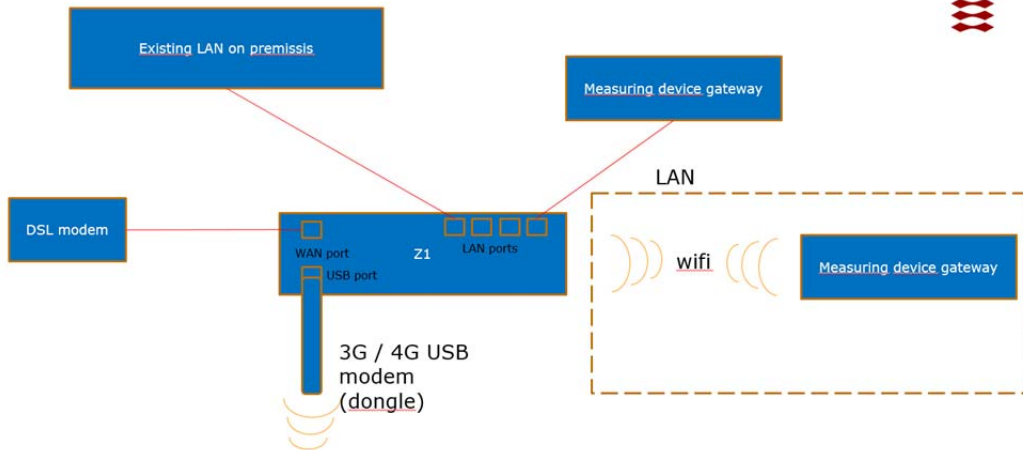


Figure 1

**Task 2.6: PowerLabDK SCADA extension**

MicroSCADA system will be connected to the DMS expected before summer 2018 app end of July 2018.

**Task 2.7: Data collection and measurement system operation**

DMS is now running although still in test mode. The database structure is as shown in figure 2.

**Architecture**

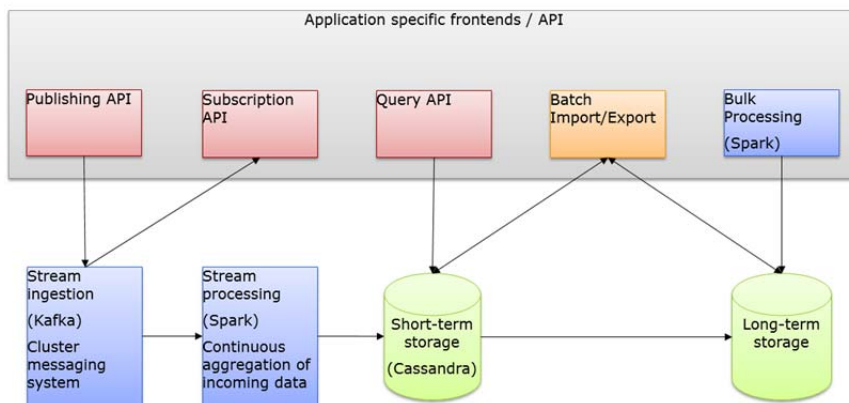


Figure 2

## Deliverable status

<b>D 2</b>	<b>Deliverable title</b>	<b>Planned completion month</b>	<b>Status</b> 1 = on schedule 2 = completed 3 = delayed
D2.1a	Catalogue on measurements and control signals	Sep. 2015	2
D2.1b	Measurement system specification	Oct. 2017	
D2.1c	Report on data handling requirements	Sep. 2017	2
D2.1d	Legal documents	Nov. 2017	
D2.2a	Design specification	June 2017	3
D2.2b	Commissioning / implementation report(s)	June 2017	3
D2.2c	Operation report(s)	Mar. 2017	3
D2.2d	Future operating / decommissioning plan	Mar. 2018	3
D2.3	SAT test report. Automated meter readings are validated, according to specification from T2.1 and reach the data collection system as specified in T2.1.	Apr. 2018	2
D2.4	SAT test report. Automated meter readings are validated, according to specification from T2.1 and reach the data collection system as specified in T2.1.	Apr. 2018	2
D2.5	Design specifications, commissioning / implementation reports, operation reports, functional building measurement systems	Mar. 2018	2
D2.6a	Specification of data collection system (SCADA extension, data warehouse, software, hardware etc.).	Mar. 2018	3
D2.6b	SAT test report data collection system.	Mar. 2018	3
D2.7c	Specification of channels for data and signal distribution to work packages.	Dec. 2018	1

## Dissemination

No PhD in WP2

## Next steps

- Establish backup solution for observations (metrics), backup for metadata established in June
- Load data from temporary data storage based on Owncloud
- Designing and implementing a more user friendly interface for data that also enables browsing cross data as well as enforcing data access (single data series)
- Implement a simple set-up to subscribe to data for management purposes and be able to forward control signals

### Quality Assurance

Status of deliverable		
Action	By	Date
Sent for review		
Reviewed	Kristian Honoré / HOFOR	20-06-2018/krih
Approved	WPL	06-07-2018

Author	Reviewer	Approver
Benny Stougaard Hansen	Kristian Honoré	Christoffer Greisen

*The project “EnergyLab Nordhavn – new urban energy infrastructures” will develop and demonstrate future energy solutions. The project utilizes Copenhagen’s Nordhavn as a full-scale smart city energy lab and demonstrates how electricity and heating, energy-efficient buildings and electric transport can be integrated into an intelligent, flexible and optimized energy system. The project participants are: DTU, City of Copenhagen, CPH City & Port Development, HOFOR, Radius, ABB, Balslev, Danfoss, CleanCharge, METRO THERM, Glen Dimplex and the PowerLab facilities. The project is supported by EUDP (Energy Technology Development and Demonstration Programme), grant 64014-0555 and runs from 2015-2019.*

