# Data Migration Plan

4.1.2018

# Table of Contents

# Change history

| Date | Version | Changes |
|---|---|---|
| 9.2.2017 | 1.0 | First official version |
| 3.1.2018 | 2.0 | The terminology has been made clearer:<br>• Pilot stage = Pilot project<br>• Datahub implementation stage = Data migration project<br>• Data migration system = Data migration service<br>• Data package = Source material<br>Chapter 3: Audit against external registers is acquired as a separate service in 2018. This is a change to the original plan<br>Chapter 3: The schedule has been updated. The data migrations for commissioning exercises and actual commissioning are not scheduled at this stage. Milestone T3 means that the industry is ready to move to commissioning exercises with regard to data migration.<br>Chapter 3: In data migration work, it cannot be assumed that companies have test environments available. This assumption has been deleted from the plan.<br>Chapter 4: The RACI matrix has been updated to correspond to the service pattern.<br>Chapter 5: The description of migration files has been completely transferred to migration file instructions.<br>Chapter 5: The description of the data migration process has been harmonised with the data migration service processes.<br>Chapter 5: Metering data inspection description has been added<br>Chapter 5: Description of administrator's reports has been abbreviated.<br>Chapter 6: Data migration system architecture requirements have been deleted |

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# Definitions

| Terms and abbreviations | Description |
|---|---|
| Attribute | One part of the data contained in the data package, for example customer ID for customer information. |
| Datahub | A centralised information exchange solution for the electricity retail market. |
| Data standard | A specification, which describes Datahub entities and entity attributes. |
| Integrity check | A check carried out on the source material of one market party of the data migration service. The system checks that the source material supplied by the market party is complete from the perspective of the data standard information model. The check requires, for example, that the accounting point ID in the contract information can also be found in the accounting point data (reference-integrity check). The integrity check differs conceptually from the consistency check in which the consistency of the source material on a market level is checked. |
| Entity | A data package consisting of several attributes. |
| Fingrid Datahub Oy | A wholly-owned subsidiary of Fingrid, established for Datahub operations. The abbreviated form ‘Fingrid’ will be used hereinafter. |
| Iteration | A correction/delivery/download repetition performed when implementing the data migration service. |
| Business process | A group of tasks linked to each other, which are done in order to achieve a set target, for example, the switching of a customer's supplier. |
| Pilot project | Before opening the data migration service, a data migration pilot project performed for the use of the whole industry, which ensures the functionality of the data migration service’s file inspection, integrity check and consistency check. |
| Migration file | A file used in data migration, which is used to export data from the source system to Datahub in the specified format. |
| File checking | Checking performed on an individual file of the data migration service. Checking covers syntax checking, checks of logic in data content and duplicate checks. |
| Data package | Data in market party data systems, e.g. Customer-, Accounting point and Contract information. |
| Data migration service | A system service in which a check of data coming from market party source systems is carried out, and about which possible deviations are reported back to the market parties. The data migration service gives summary data to Fingrid about the progress of the conversion process and what stage each market party is at. |
| Data migration work group | A group of 11 pilot companies selected by Finnish Energy, i.e. a pilot group that participates together with Fingrid’s and the data migration plan’s active partner on the specifications of documentation and the process concerning data migration. |
| Data model | A data model is an abstract model, which organises data attributes and specifies how they are connected to each other. |
| Consistency check | Checking performed on all the source material of the data migration service. The system checks that the source material supplied by different market parties is unambiguous and without contradictions. The check requires, for example, that an accounting point may have only one valid sales agreement. Consistency checking is conceptually different from integrity checking, which is performed on source material supplied by an individual market party. |

# 1 Summary

Datahub data migration means the quality assurance and downloading of the basic data and metering data of business processes from source systems to the new Datahub system before its introduction. The source systems are the business applications of electrical grid companies and electricity suppliers, in which customer-, accounting point-, contract- and metering data are kept. Data migration work has two main objectives:

- The harmonisation of data supplied from source systems
- The implementation of the initial load of the Datahub system.

The harmonisation of data supplied from source systems is necessary, in order for it to be possible to perform business processes from the systems in the Datahub system after its introduction. Data migration source data comes from very different business applications, and from about 200 companies operating in the electricity market, which have different practices in the maintenance of the basic data of business processes.

In order to harmonise source data and ensure quality, a separate 'data migration service' is being acquired, which will serve as a data preprocessing system that can be downloaded to the actual Datahub system. The market parties supply source data as migration files to the data migration service in a format specified in Datahub data standard. The migration files are delivered through a browser-based user interface. The data migration service performs the following checks on the source material:

- File check: The migration file supplied by the market party is in a format accordant with the data standard
- Integrity check: The source material supplied by the market party is internally complete from a perspective of the Datahub business processes
- Consistency check: The source material supplied by the market party is consistent with the material supplied by other parties.

The data migration service is structured so that the market parties can independently perform migration file-specific and party-specific checks, regardless of the deliveries from other parties. The data migration service produces deviation reports, based on which the market parties perform the necessary corrective measures in the source systems. The data migration service does not modify or enrich the source material data, so all corrective measures must be performed in the source systems. With regard to data protection and data security, the data migration service meets the same requirements as the actual Datahub system.

Fingrid is responsible for performing market-level inspections. Based on its results, a decision is made on the publication of source material for downloading to the actual Datahub system. Datahub's business processes require that all market parties deliver complete data in data migration. The supplier of the Datahub system is responsible for downloading transferable data to the Datahub system. After downloading, the Datahub system delivers a data migration report, which can be used to ensure that data ending up in Datahub corresponds to the source system data. It also ensures that the downloaded data can be processed correctly in the business processes.

Data migration work begins with a pilot project, which ensures the functionality of data migration service tools and the data migration process. The data migration process concentrates on the Datahub readiness of market parties in relation to data quality, and ensures the ability of market parties to deliver source material within the specified time window.

A preliminary schedule for data migration work has been specified as follows

- Pilot project: 10/2017 – 03/2018
- Data migration project: 04/2018 – Datahub commissioning.

Fingrid has prepared instructions (Appendix 2), which describe measures that market parties should initiate based on this plan and the data standard. The instructions can be found at the Ediel.fi portal maintained by Fingrid.

# 2 Introduction

## 2.1 Datahub

Information exchange in the electricity retail market is needed in the management of different electricity market business processes. Business processes are, for example, imbalance settlement, the moving of an end-user from one address to another and the switching of supplier. These processes and the information exchange used in them should function seamlessly and effectively from the perspective of different parties.

In order to manage the information exchange and business processes of the above-mentioned matters, the Ministry of Employment and the Economy asked Fingrid Oyj to implement a solution in which all the information exchange of the electricity market would be centralised in one service. Work began on 15 April 2015.

The solution is the so-called Datahub. Datahub is a database for metering and basic data where market parties submit and retrieve information needed for their market processes.

Datahub is a centralised information exchange system for the retail market, storing information concerning 3.5 million electricity accounting points in Finland. Datahub's information will be used by around 100 electricity suppliers and over 80 distribution system operators serving electricity consumers.

Datahub makes it easier to process metering data, simplifies and accelerates customer contract transactions and makes the service more error-free. A standardised interface to electricity consumption data promotes the full exploitation of smart grids and meters, as well as new business opportunities.

Datahub can also process and refine information saved in it. Using the smart remotely readable electricity meters widely available in Finland, a great deal of data accumulates daily at each accounting point. This data and possible future mobile applications can offer electricity consumers completely new services. An example might be an application by which consumers can monitor at

once electricity consumption data both at their town dwelling and at their summer cottage, even if they are located at different places in Finland.

Datahub and smart systems also enable electricity users to participate in demand-side management. Demand-side management means the balancing of electricity production and consumption, so that its use is adjusted automatically according to the load on the electricity grid. At times of peak consumption, electrical devices can be switched off and, on the other hand, overproduction can be discharged, for example into the equipment of large properties.

For the purposes of Datahub operations, Fingrid Datahub Oy, a wholly-owned subsidiary of Fingrid, was established on 16 February 2016, the task of which is to complete the electricity market's centralised information exchange solution, Datahub.

## 2.2 Members of the data migration plan

This plan is intended for electricity retail market parties and their data systems suppliers to support possible changes in the systems and the quality improvement required by source material. Based on this plan, the market parties can prepare their own data migration plan, which analyses needs for change in their own business applications, and plans the implementation and testing of such needs.

The data migration plan describes how necessary data can be imported from market party systems to the Datahub system. A more precise definition of from how long a period data should be supplied and under what terms can be found in paragraph 5.1.2. When preparing a data migration plan, technical description and instructions created should be used in the invitation to tender for the data migration service, and as technical instructions for market parties about how the data should be delivered. The data migration group commented on the data migration plan to all retail market parties and their IT systems suppliers before its publication.

The data migration plan contains the following areas:

- A description of the method and tool used to import the source material to Fingrid's data migration service, and a technical description of the format of information exchange, which the Datahub supplier can have run to its actual system
- Description of data migration process
- Description of migration files that market parties use to deliver data to be transferred to Datahub (Appendix 1)
- Instructions about migration file content and its delivery (Appendix 1)
- A description of additional tool functionalities by which data and the process are controlled (metering, monitoring, downloads/errors and error reports)
- The description of the repeatability of downloads and the management of different delivery batches (several parties and several deliveries possibly with them)

## 2.3 Datahub's data migration project and its targets

Data migration is a sub-project of the Datahub project. Data migration is carried out in several correction/delivery/download repetitions, for which the term ‘iteration’ will be hereinafter used. A data migration project has two main objectives:

- To improve and harmonise the quality of data delivered by market parties
- Initial loading of Datahub system.

A data migration project is divided into three stages:

The aim of the ***planning and procurement stage*** is to procure and set up the data migration service. As a technical solution for the data migration service, a commercially available, fit-for-purpose tool is primarily used. If a fit-for-purpose tool cannot be found, a dedicated system is created for data migration. At the planning stage, examples are prepared of data migration migration files, and instructions on how market parties should prepare themselves for data migration. Source material quality criteria and a quality measurement method are also specified.

The aim of the ***pilot project*** is to ensure the functionality of the data migration process, and the performance and reliability of the data migration service. The aim is also to improve instructions concerning data migration based on accumulated experiences. The pilot project is carried out together with selected pilot companies, so the processes can be tested with the correct source data. Pilot project start-up requires the data migration service to have been procured and to be available.

The aim of a data migration project is to harmonise the data supplied from source systems, ensure data quality, deliver source material in a coordinated fashion and initial load the Datahub system. The whole industry takes part in this stage. The quality and security criteria of the data migration project are tightened up from one iteration stage to another, in order to reach the final target.

In order to improve data quality, market party data is compared to existing registers maintained by a third party, such as address information, association and company registers. The checking of data against registers maintained by a third party is being procured in 2018 as a separate service from some service providers from the Population Register Centre. In order to guarantee efficient and reliable operation, the customer’s personal ID is needed to precisely identify a personal customer. Such data is not available on all customers in market party systems. It is not permitted to supplement personal information with data from the Population Register. This requires a change in the law.

## 2.4 Monitoring industry preparation

Fingrid is actively monitoring the preparation by the industry for changes brought by Datahub as part of the data migration project. Monitoring is carried out using a range of surveys targeted at the industry. Monitoring the preparation of the industry is vitally important for it to be possible to carry out the planning and implementation of the whole Datahub project in an efficient and meaningful way.

Three monitoring surveys were sent to industry parties, analysing market party readiness for changes brought by Datahub. The surveys focused on resources available to market parties, the compatibility of data systems to the Datahub data model and changes made to systems. Source material on data systems to be analysed is received for the initial loading of Datahub and, on the other hand, the same systems are integrated into Datahub at the time of its commissioning. In other words, the systems must be able to communicate with Datahub after Datahub's commissioning.

In addition to monitoring surveys, the preparedness of the industry will be monitored in a survey carried out about four times a year, which will monitor the preparedness of market parties by focusing on monitoring the progress of the updating and renewal projects of companies' data systems. In addition to this, the surveys may also ask about other essential and topical matters. The improvement of data quality will be monitored through the data migration service.

# 3 Stages of data migration work

Data migration work is divided into three stages:

- Procurement and planning stage
- Pilot project
- Data migration project.

In the procurement and planning stage, the data migration service is set up.

The pilot project and Datahub data migration project are divided into iteration stages. A milestone is set for each iteration stage, and it must be possible to move to the next iteration stage once the milestone's requirements have been met. A preliminary schedule for the pilot project and data migration project is shown in Figure 1. The schedule gives a picture of the duration of the project and iteration stages. Two stages are planned for the pilot project. Three iteration stages are planned for the data migration project, as well as data migration required for commissioning practice and the data migration required for actual commissioning. The schedule for commissioning practices and actual commissioning is dependent on the readiness of the Datahub system and on a separately specified Datahub commissioning plan, so these stages are not scheduled in this plan.

Deliveries are started from customer information, because it is expected to present the most challenges. The iteration stages and milestones are described in greater detail in paragraphs 3.2 and 3.3 .

| | 2017 | | | | | | 2018 | | | | | | | | | | | | 2019 | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| month | 7 | 8 | 9 | 10 | 11 | 12 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 |
| **Implementation of the data migration service** | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Delivery M1 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 1. Data security auditing | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Delivery M2 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Delivery M3 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Delivery M4 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 2. Data security auditing | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Interface to external registers | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| **Pilot project** | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Service contracts | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Users and connections | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| P0 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 1. Pilot phase | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| P1 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 2. Pilot phase | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| P2 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| **Data migration project** | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| T0 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Users and connections | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| **1. Iteration phase** | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Sub-target 1 (party- and customer data) | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Sub-target 2 accounting point-, metering grid area-, production unit- ja exchange point data) | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Sub-target 3 (product-, contract- and metering data) | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| T1 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| **2. Iteration phase** | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Mass check against external registers | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| T2 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| **3. Iteration phase** | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Comissioning GSRN identification | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| T3 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |

FIGURE 1 PRELIMINARY SCHEDULE FOR PILOT- AND DATA MIGRATION PROJECTS

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## 3.1 Data migration work procurement and planning stage

In the procurement and planning stage, the precise requirements of the data migration service are specified and its delivery is put out to tender. Fingrid sets up and tests the service together with a selected system supplier.

In the data migration procurement and planning stage, the following instructions for the industry are prepared:

1. Instructions for market party data migration plan
    - Short instructions for market parties' own data migration plan

2. Example files of migration files
    - Example files from each migration file

3. Data cleaning

At the procurement and planning stage milestone, criteria for being able to start a data migration pilot project are measured.

TABLE 1 PROCUREMENT AND PLANNING STAGE MILESTONE

| Milestone | Acceptance criteria |
|---|---|
| P0 | • Data migration service available Functionalities required for starting the pilot project have been implemented and tested. The system can accept party and customer information, perform a file check and create an deviation report.<br>• Service agreements with parties of the pilot group concluded for the processing of material covered by the Data Protection Act.<br>• Data protection auditing for the data migration service is carried out acceptably, so that the market parties can transfer their data to the service.<br>• Data migration example files are published for the industry<br>• Data migration service user management works |

## 3.2 Data migration work pilot project

During the pilot project, a data migration service is built and inspection rules, data downloading tools and reporting mechanisms concerning it are specified. The pilot project primarily measures the readiness of the data migration service. Market parties participating in the pilot should be able to pick data from their own systems in the format specified in data standard. A process is also ensured with the pilot group, by which data is received picked and delivered in a coordinated fashion from all pilot group members. The pilot project is divided into two stages:

1. Pilot stage 1: The data migration service business process 'Import of source material' is verified.

2. Pilot stage 2: The data migration service business process ‘Consistency check of source material’ is verified.

The objectives of the pilot stages are specified in the following tables:

**TABLE 2 PILOT STAGE OBJECTIVES**

| Pilot stage (milestone) | Objectives |
|---|---|
| Pilot stage 1 (P1) | • The pilot group can deliver data in formats and content in accordance with data standard and migration file specifications<br>• Reference-integrity checks between different entities and attribute inspection rules, which extend to different entities, are verified.<br>• The functionality of the process ‘Import of source material is verified using production-like data<br>• Serious deviations are corrected in the data migration service<br>• Inspection rules are corrected, and new rules are added in the event of deficiencies. Serious deviations in inspection rules are corrected.<br>• The lead time and efficiency of the process are measured in paragraph 5.5 against criteria set for functions 1,2 and 3.<br>• Functionalities required for the start of iteration stage 2 are implemented in the data migration service. |
| Pilot stage 2 (P2) | • Inspection rules for checks carried out against the data of other parties are created<br>• The functionality of the process ‘Consistency check of source material’ is verified using production-like data<br>• Methods by which data is received in a coordinated way from each pilot group company at the same picking moment are created and tested<br>• The preparation of data simultaneously by several parallel users is tested<br>• Inspection rules are corrected, and new rules are added in the event of deficiencies. Serious deviations in inspection rules are corrected.<br>• The lead time and efficiency of the process is tested and they must meet the criteria set in paragraph 5.5 for functions 4 and 5.<br>• The project has reliable data about the expected performance of metering data picking |

The following actions are carried out at each stage:

1. Either with a picking tool produced by a system supplier or its own tools, the pilot group extracts data from the source system and produces a file in a specified format and content
2. The file is read into the data migration service
3. If necessary, the source system picking tool is corrected if errors arise in downloading
4. A check is run on the data

5. The person downloading the data receives a report of the check, which lists possible deviations
6. If necessary, new inspection rules are added and existing ones corrected
7. Problems and ideas are recorded concerning use of the data migration service and the conversion process
8. The supplier of the data migration service implements changes to the service, which have been agreed with Fingrid
9. A data migration service is prepared for the following stage
10. If necessary, instructions and specifications are improved and updated

The table below shows the acceptance criteria for each milestone of a pilot project, which should be fulfilled before the project can proceed to the next iteration stage.

**TABLE 3 MILESTONE ACCEPTANCE CRITERIA**

| Milestone | Acceptance criteria |
|---|---|
| P1 | • The fields of files prepared by the pilot group for the data migration service are in a format in accordance with the data standard and migration file specification, and their content is based on the data standard<br>• The users themselves can upload files to the data migration service<br>• The service can reliably verify the completeness of the material from an individual party<br>• Attributes whose value depends on the value of another data entity field should be in condition<br>• The creation of file checking rules can be successfully done in the data migration service<br>• The creation of data migration service deviation reports can be done successfully |
| P2 | • For the purposes of gathering data, the plan and communication mechanisms are specified from all market parties at the same picking moment<br>• In the data migration service, it is possible to create inspection rules between parties<br>• The performance and scalability of the processes 'Import of source material' and 'Source material consistency check' are sufficient<br>• The accessibility of the data migration service is sufficient<br>• The data migration service can reliably perform a consistency check on all data delivered to the service |

During the data migration pilot project, the following instructions for the industry are prepared:

1. Data quality requirements
    - Information about the inspection rules applicable to the service

- Information about data migration quality categories, - requirements and quality measurement method

2. Data migration service user instructions
   - Market party user instructions including deviation report descriptions
   - User support instructions

## 3.3 Data migration project

All market parties are included in the data migration project and, during this stage, the market parties should be able to pick data from their own systems and that data should meet the quality objectives specified at the milestone of each conversion process. At this stage, the readiness of the whole market is measured. In the data migration project, information about the data migration service is transferred to Datahub for the use of process testing.

Below is an approximate list of key objectives of the iteration stage and the measures required for them.

TABLE 4 ITERATION STAGE OBJECTIVES

| Iteration stage (milestone) | objectives |
|---|---|
| Iteration stage 1 (T1) | • All market parties must be able to deliver data at quality requirement level 1 in formats and content in accordance with data standard and migration file specifications.<br>• The functionality of the data migration service inspection rules is verified, once all market parties prepare their data for the data migration service<br>• Deviations disrupting use are corrected in the data migration service<br>• Inspection rules are corrected, and new rules are added in the event of deficiencies. Serious deviations in inspection rules are corrected.<br>• Errors on quality requirement level 1 in transferred files are corrected<br>• The lead time and efficiency of the process are tested in paragraph 5.5 against criteria set for functions 1,2 and 3 (Table12). |
| Iteration stage 2 (T2) | • All market parties must be able to deliver data at quality requirement level 2 in formats and content in accordance with data standard and migration file specifications<br>• Reference-integrity checks are performed between different entities as are attribute inspection rules, which extend to different entities. A check is carried out between data uploaded by a market party.<br>• Customer and address information supplied by market parties is checked against a third-party register<br>• Deviations disrupting use are corrected in the data migration service |

| Iteration stage (milestone) | objectives |
|---|---|
| | • Inspection rules are corrected, and new rules are added in the event of deficiencies. Serious deviations in inspection rules are corrected.<br>• Errors on quality requirement level 1 and 2 in transferred files are corrected<br>• The lead time and efficiency of the process are tested in paragraph 5.5 against criteria set for function 4 (Table 12)<br>• Datahub's system supplier has created tools and mechanisms for the reading of data from the data migration service to Datahub<br>• Datahub system supplier has created functionalities required for data migration reporting<br>• Datahub's system supplier has created tools and mechanisms for the reading of metering data to Datahub.<br>• Functionalities have been created in the data migration service for importing Datahub's data migration reports |
| Iteration stage 3<br>(T3) | • Grid owners can deliver metering point IDs in GSRN format<br>• The data migration service can offer market parties correspondence tables of metering point IDs<br>• A process by which GSRN IDs are maintained until Datahub commissioning is specified<br>• All market parties must be able to deliver data at quality requirement level 3 in formats and content in accordance with data standard and migration file specifications<br>• Data transfer from the data migration service to Datahub is verified<br>• Errors on quality requirement level 1 and 2 in transferred files are corrected<br>• The preparation of metering data in Datahub is verified<br>• The efficiency and lead time of the transfer process are tested in terms of both metering data and basic data. The process must meet the criteria set in paragraph 5.5 for functions 6, 7 and 8 (Table 12).<br>• A check run on the data of all market parties can be performed<br>• Datahub data migration reports can be announced to market parties<br>• The data migration service can create a summary report of a data migration |
| Commissioning practices<br>(T4) | • All market parties must be able to deliver source material within a given time window<br>• The simulation of commissioning is performed in full-scale, and possible observations made in simulation are corrected and the corrections verified<br>• Testing and a fluency evaluation of the whole process are carried out<br>• Performance is verified as corresponding to the objectives set in paragraph 5.5 for all functions. |

| Iteration stage (milestone) | objectives |
|---|---|
| Commissioning (T5) | • All market parties are able to deliver data, which meets the quality criteria for Datahub's commissioning<br>• The key reference completenesses of data are in condition.<br>• Errors on quality requirement level 1, 2 and 3 in transferred files are corrected. |

The following actions are carried out in the data migration project:

1. Either with a picking tool produced by a system supplier or its own tools, a market party extracts data from the source system and produces a file in a specified format and content
2. If necessary, instructions and specifications are improved and updated
3. The market parties prepare data for the data migration service
4. Inspection rules are revised or, if necessary, more are created
5. Approved data is uploaded to the public area
6. The data migration service supplier carries out the necessary corrections to the transfer mechanisms and tools which convey data to the Datahub system
7. The Datahub system supplier reads data from the data migration service to Datahub (from iteration stage 3)
8. The market parties carry out spot checks on random records in order to ensure data quality
9. The Datahub system supplier corrects errors in the transfer tool
10. The Datahub system supplier reads metering data from migration files to Datahub
11. The Datahub system supplier produces data migration reports (from iteration stage 3)
12. The data migration service creates a summary report of the data migration (from iteration stage 3)
13. The data in Datahub's data migration report is compared to the source material. The data is reported and possible deviations highlighted. (from iteration stage 3)
14. The Datahub system supplier corrects problems that may have arisen in uploading

Actions concerning commissioning practices and actual commissioning are specified in the commissioning plan.

The table below shows the acceptance criteria for each milestone, which should be fulfilled before the project can proceed to the next iteration stage.

**TABLE 5 MILESTONE ACCEPTANCE CRITERIA**

| Milestone | Acceptance criteria |
|---|---|
| T0 | • Performance-related requirements are met with regard to functions 2–5 (Table 12)<br>• File inspection rules exist and have been verified<br>• Completeness inspection rules exist and have been verified<br>• Consistency inspection rules exist and have been verified |

| Milestone | Acceptance criteria |
|---|---|
| | • Instructions concerning data migration are ready and up-to-date<br>• The data migration service works acceptably. Serious deviations are corrected in the data migration service.<br>• P1 and P2 have been acceptably performed<br>• The data migration service has been approved by data security auditing |
| T1 | • The fields of files prepared by all market parties for the data migration service are in the format in accordance with the data standard and migration file specification, and their content is based on the data standard<br>• The source material meets the criteria set for the iteration stage |
| T2 | • The delivered material meets the criteria of quality requirement level 2<br>• The data is checked against registers maintained by third parties<br>• The source material meets the criteria set for the iteration stage |
| T3 | • Data migration process performance must meet the criteria specified in paragraph 5.5<br>• The source material meets the criteria set for the iteration stage<br>• Datahub has a loading tool allowing data to be read from the publishing area to Datahub<br>• Datahub creates a data migration report, based on which data stored in Datahub can be compared to data in source systems<br>• Metering point IDs are changed to GSRN IDs. |
| T4 | • It is ensured that the whole date conversion can be completed in a given time window at the time of commissioning<br>• Source material can be collected from market parties at a given time.<br>• The source material meets the criteria set for the iteration stage |
| T5 | • The data is transferred to Datahub at the commissioning stage.<br>• It is ensured that data transferred from the publishing area corresponds to the source material both quantitatively and qualitatively.<br>• The source material meets the criteria set for the iteration stage |

## 3.4 Commissioning of the Datahub system

A separate detailed plan of commissioning is prepared together with the industry as part of the Datahub implementation plan. The commissioning plan is published in the Ediel.fi portal.

If necessary, the data migration plan is updated as commissioning planning progresses.

# 4 Tasks and responsibilities

The tasks and responsibilities of data migration work are described in the accompanying RACI matrix (Responsibility assignment matrix). Roles in the matrix are divided as follows:

- R = responsible
- A = accountable
- C = consulted
- I = informed

### TABLE 6 DATA MIGRATION TASKS AND RESPONSIBILITIES

| Task | Market party | Data migration partner | System supplier | Datahub supplier | Fingrid |
|---|---|---|---|---|---|
| **Notifications** | | | | | |
| Notifications and contact directed at data migration project market parties | C/I | C | I | C/I | A/R |
| Notifications directed at data migration project system suppliers | | C | C/I | | A/R |
| Notifications and reporting directed at the data migration project pilot group | C/I | R | I | C/I | A/R |
| Notifications for other external stakeholders in the data migration project | | C | | | A/R |
| **Training and technical support** | | | | | |
| Instructions in the use of the data migration service | C/I | A/R | | | C/I |
| Training for the pilot group | C/I | A/R | | | C/I |
| Training for market parties and system suppliers | C/I | A/R | | | C/I |
| Training for the Fingrid project group | | A/R | | | C/I |
| Data migration project technical support for market parties | I | A/R | | | R |
| Data migration project technical support for system suppliers | | A/R | I | | I |
| Technical support for the Datahub supplier | | A/R | C | I | I |
| **Data migration service** | | | | | |
| The implementation of entity- and attribute-specific inspection rules | C/I | A/R | C/I | | I |

| Task | Market party | Data migration partner | System supplier | Datahub supplier | Fingrid |
|---|---|---|---|---|---|
| based on the data standard | | | | | |
| Integration into the company information register | C/I | R | C/I | | A |
| Integration into the personal information register | C/I | R | C/I | | A |
| Integration into the address information register | C/I | R | C/I | | A |
| Data migration service procurement | | | | | A/R |
| Data migration service installation | | A/R | | | I |
| Data migration service maintenance and management | | A/R | | | C |
| Establishment of data migration service basic data | | A/R | | | C/I |
| Maintenance of data migration service user information | C/I | C | | | A/R |
| **Data checking and correction** | | | | | |
| Preparation of migration file examples | C | I | | | A/R |
| Picking tools in order to produce a data migration file (other than metering data) | A/R | C | R | | |
| Picking tools in order to produce a data migration file (metering data) | A/R | C | R | | |
| The production of migration files based on specifications | A/R | | R | | |
| The uploading of migration files to the data migration service | A/R | | | | |
| The checking of uploaded data (other than metering data) | | A/R | | | |
| The checking of uploaded data (metering data) | | A/R | | | |

| Task | Market party | Data migration partner | System supplier | Datahub supplier | Fingrid |
|---|---|---|---|---|---|
| The production of a company-specific inspection and correction report | I | A/R | | | I |
| The overall reporting of the data migration project | | A/R | | | I |
| Data correction and enrichment for the market parties' own systems | A/R | C | R | | |
| **Datahub system loading tool** | | | | A/R | |
| Data transfer from the data migration service to Datahub | | R | | A/R | |
| Necessary changes to market parties' own data systems | A/R | | R | | |

# 5 Data migration process

## 5.1 General description of process

Figure 2 shows the stages of the data migration process. Data for transfer to Datahub is in the current data systems of different market parties.

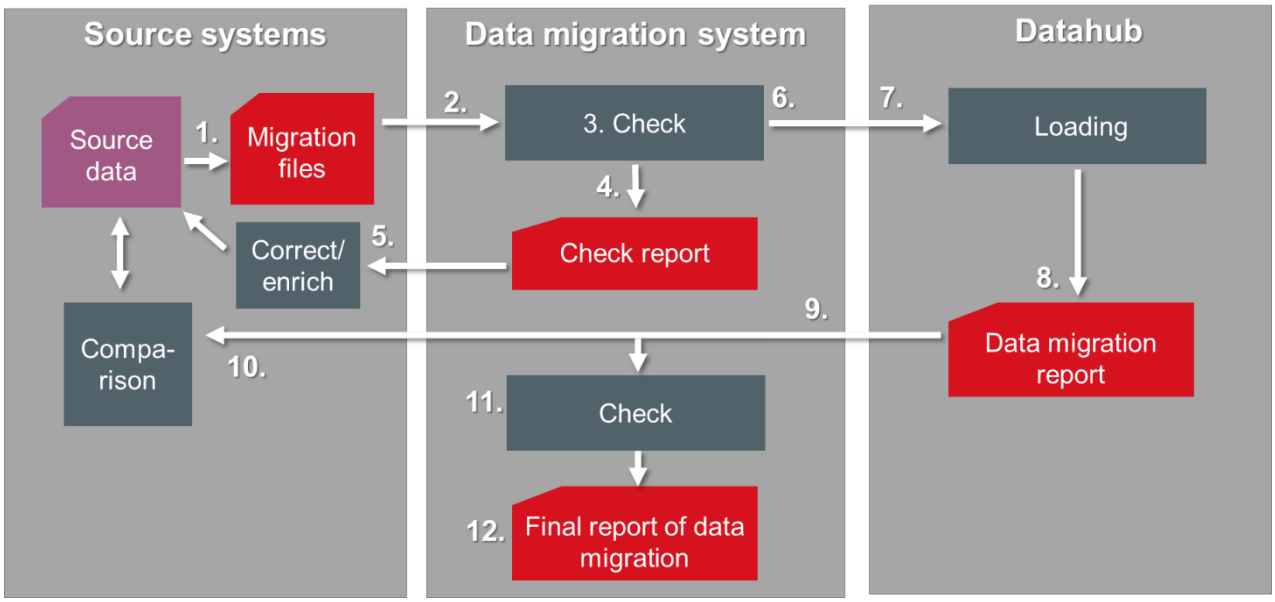


FIGURE 2 DATA MIGRATION PROCESS

In *Stage 1,* each market party produces from its own data systems fields specified by the data standard for specified migration files. The delivery and data content of the migration files are described in greater detail in the document *Migration file instructions* (Appendix 1). The uploading of data to the data migration service is dealt with in paragraph 5.2.1.

In *Stage 2*, the basic data of market parties is uploaded to the data migration service, where rules based on the Datahub data model are specified in advance. Metering data is conveyed directly to the Datahub system, either via the user interface or a separate SFTP-connection.

During *Stage 3,* based on rules the data uploaded by market parties is checked in relation to the data model. The data is deleted from the data migration service database when it is no longer needed for checking. The data migration service database is emptied at least after every iteration stage.

In *Stage 4*, the data migration service produces party-specific deviation reports by source material. The deviation reports are in xlsx format, and are stored in the file archive. The parties can retrieve reports from their own user interface. Original data, type of error and possible suggestions for correction are written in the report. The data migration service can only provide correction suggestions in some cases. Fingrid does not oblige market parties to perform corrections mechanically. The parties can compare reports to source system data content, and verify the

consistency of the basic data of the data migration service and source systems. The preliminary data content of the deviation reports is described in paragraph 5.4.2.2.

In *Stage 5*, data is corrected or enriched in the source systems based on deviation reports to a suitable extent. The iterations comprising stages 1 to 5 are performed as many times as necessary, until the data has acceptably passed the inspection rules.

Fingrid's role is to monitor the progress of the process and, if necessary, to provide support to different market parties. The data migration service offers Fingrid situation reports on how each market party has progressed with regard to its own data migration. Once a market party has produced transfer data based on the data model, Fingrid verifies and approves the party's data for transfer to Datahub. Monitoring the data migration process and the tools for such monitoring are described in paragraph 5.4

In *Stage 6*, the data that has passed inspection is transferred to the publishing area of the data migration service. This stage requires that a technical specification for the data transferred to Datahub be carried out. The specification work is done together with the Datahub system supplier.

In *Stage 7,* data transfer from the data migration service publishing area to Datahub is started by the Datahub administrator.

In *Stage 8*, Datahub creates migration file- and party-specific data migration reports that contain data uploaded to Datahub.

In *Stage 9*, the data migration reports produced by Datahub are imported to the data migration service.

In *Stage 10*, the market parties compare the data imported to Datahub to the source system data using data migration reports received from Datahub. From the point of view of data migration, this is not a necessary stage but its purpose is to verify the consistency of source data and Datahub data.

In *Stages 11 to 12*, data from Datahub's data migration report is compared to the data published in Datahub. Based on the results of the comparison, a data migration final report is created, which consists of a summary and deviation list of data transferred.

### 5.1.1 Migration file description

The structure and data content of the migration files are described in in the document *Migration file instructions* (Appendix 1).

### 5.1.2 Data delivery responsibility and rules concerning data selection

Market party data systems can store data, the maintenance responsibility for which rests with another market party. With regard to accounting point data, for example, each distribution system owner is responsible for maintaining the accounting point data in its own area. Accounting point data may be in the systems of electricity suppliers, but data is delivered to datahub in data migration only by a distribution network owner. The table below shows which market party delivers

data in migration files in a data migration project, and the period of time covered by historical data that is delivered in data migration.

**TABLE 7. SPECIFICATIONS FOR MIGRATION FILES ABOUT DATA DELIVERY RESPONSIBILITY, RULES CONCERNING DATA SELECTION AND NEED TO TRANSFER HISTORICAL DATA**

| Migration file | Data owner that delivers data to Datahub | Rules | Data from a time interval |
|---|---|---|---|
| Customer information | Distribution system owner (grid agreement)<br>Supplier (sales agreement) | If the information of a customer belonging to different market parties differs from each other, the market parties must establish the correct information amongst themselves, so that the grid owners establish it amongst themselves and the sales companies with the grid owners. Information may also be compared with external registers. | Customers with valid contracts.<br>Customers with contracts that expired within six weeks.<br>Customers with future contracts. (See Contract) |
| Accounting point data | DSO | If a DSO's system has accounting points external to the distribution system, the DSO only supplies the accounting points in its own area. Only main metering points are transferred. | Accounting points in use are imported. (Under construction, connected or disconnected)<br>Accounting points removed from use are imported if a contract specified as transferable is connected to them (see Contract information). |
| Contract information | Distribution system owner (grid agreement)<br>Supplier (sales agreement) | - | Valid contracts and contracts that expired within six weeks.<br>Contracts beginning in the future. |
| Party information | All | Parties deliver only their own data. | Only valid data. |
| Product information | DSO (grid product)<br>Supplier (sales product) | - | Valid products and prices connected to transferable contracts. |
| Metering data | DSO | Metering data is picked from the system from which it is reported to suppliers. | Metering data is imported to Datahub from contracts valid from the period of contractual validity and those that expired within six weeks.<br>Metering data is retrieved from the period of contractual validity, but no more than six weeks before. |

| Migration file | Data owner that delivers data to Datahub | Rules | Data from a time interval |
|---|---|---|---|
| | | | Only hourly-metered metering data is collected from metering data history.<br>The transfer of historical data in terms of metering data is depicted in greater detail in Figure 7. |
| Authorisation information | Third party | Authorisations are based on third-party power of attorney to process data for a specified accounting point.<br>The powers of attorney cannot be found from the data systems, so checking must be taken care of outside the data systems. Fingrid is responsible for the procedural method. | The third party specifies the valid authorisation information necessary for the migration file. |
| Metering grid area data | DSO | - | Only valid data |
| Connection point data | DSO | - | Only valid data |
| Production unit data | DSO | - | Only valid data |
| Contact information | Distribution system owner (grid agreement)<br>Supplier (sales agreement)<br>All (Party information) | - | Valid contact information connected to transferable contracts. |

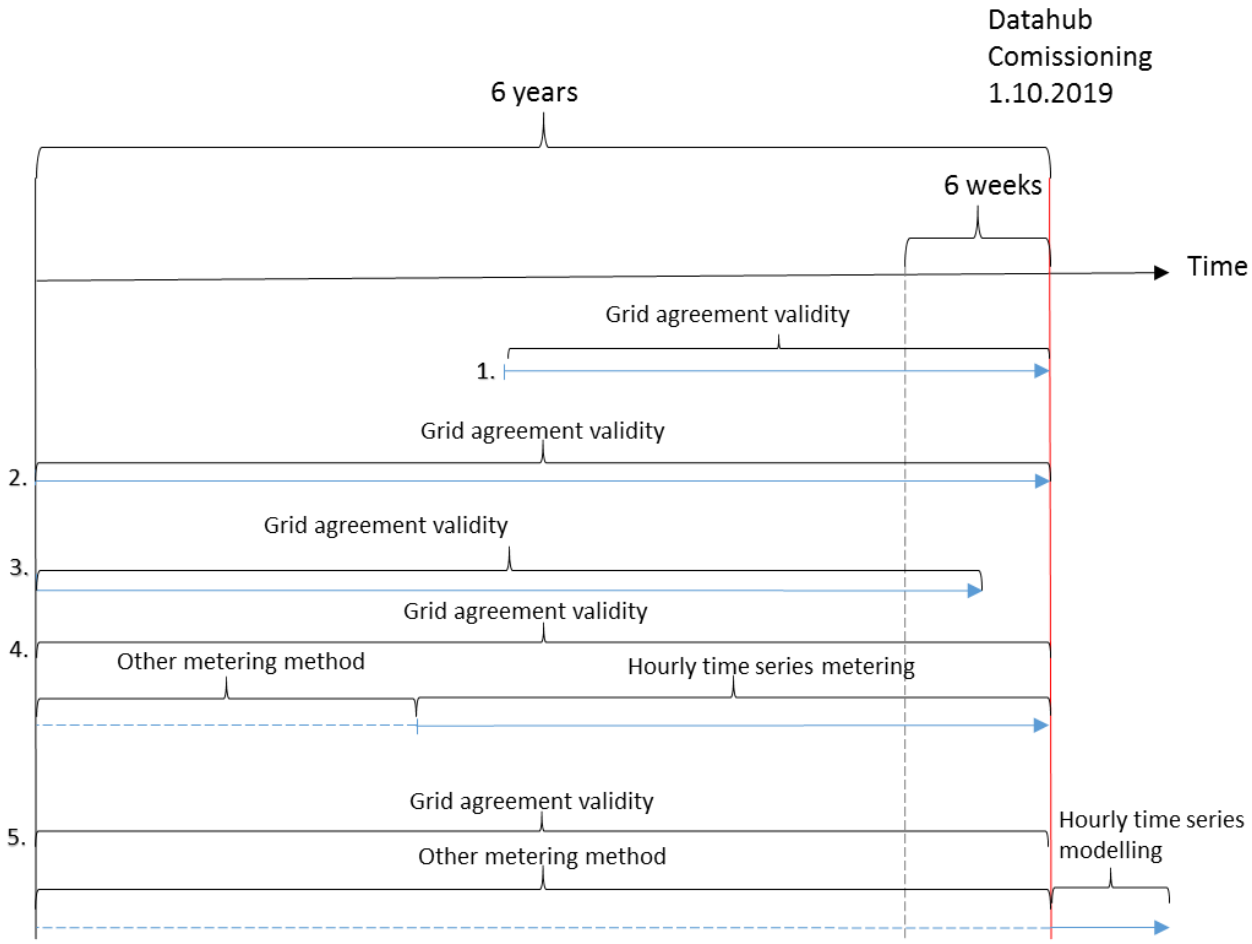


FIGURE 3. RULES CONCERNING THE TRANSFER OF METERING DATA HISTORICAL DATA

The figure above shows rules concerning the transfer of metering data history. A red vertical line depicts the moment in time from which data is transferred to Datahub backwards. During the data migration project, data is uploaded in several iterations, so a red vertical line may also depict the moment when data is extracted from the system for data inspection.

1. The accounting point agreement has been valid for a shorter period than six years, so metering data is imported from the whole contract period.

2. The accounting point agreement has been valid throughout the six-year period. Metering data is transferred from the whole six-year period. Metering data from a longer period than that is not imported to Datahub.

3. If an accounting point agreement has expired no more than six weeks before the data was extracted from the source system, the metering data from these accounting points is also taken. Metering data is collected from the expiry of the contract and from the period of its validity, but starting from no earlier than six years from the moment it was picked.

4. In the metering data, only metering data within the sphere of hourly time series metering is taken into account. If the metering method has changed during the validity of the contract, only hourly time series-metered data is included in the metering data.

5. If accounting point consumption is metered in some other way than as an hourly time series, then the use of these accounting points must be matched with a balancing calculation no later than at the time of Datahub commissioning, and transferred for the use of the hourly time series or hourly time series modelling.

Most of the metering data is uploaded to Datahub in good time before commissioning, in a so-called main uploading of metering data. At the time of commissioning, only new and changed values created after the main uploading are uploaded, or alternatively new and changed metering data can be imported to Datahub through continual input after the main uploading. The precise procedure is specified in commissioning planning.

Market parties must be able to pick data from production environments or from test environments on a level with a production environment. This is especially important in iteration stage 3, where the consistency of data delivered to the data migration service is measured.

### 5.1.3 Types of error

The following is a list of types of error for which inspection rules for the data migration service are created. Inspection rules have their own documents specified for them, listing all inspection rules. Rules are particularly added during a pilot project, but they can also be added during a data migration project. Based on specified rules, inspection rules for the data migration service are implemented.

TABLE 8. LIST OF TYPES OF ERROR

| Error | Description |
|---|---|
| Data missing | Field specified as mandatory but no value entered in it. Note: Some of the fields have necessities, such as “Mandatory if status other than ‘under construction’ and fuse size not given”. |
| Incorrect data type | Field’s data content does not correspond to specified data type. For example, letters are in a numerical field. |
| Incorrect format | Field’s data content not in required format. For example, "<number of cables>x<number of phases>x<ampere>The number of cables is excluded if only one cable is in use" |
| Incorrect value | Field’s value does not correspond to the specified group of values. |
| Duplicate data | Data specified as identifying appears more than once in the data, so is not unique. |
| Reference-completeness error | Field is ID-/ code field, for which a corresponding value cannot be found from the object in question. For example, In the contract a reference to an accounting point which cannot be found. |
| Register error | Field/data is checked against an external register, such as the Company Register of the Finnish Patent and Registration Office, but the value in question, such as business ID, cannot be found. |
| Register difference | Field/data is checked against an external register, such as the Company Register of the Finnish Patent and Registration Office, the key value in question is found but |

| Error | Description |
|---|---|
| | there is a difference in the related data. For example, the company name does not match. |
| Overlapping periods of validity | The period of validity in the data row overlaps with that in another data row and so is contradictory. For example, an accounting point has several sales agreements valid simultaneously. |
| Error in logic | For example, an accounting point has no grid agreement throughout the period of validity of the sales agreement. |

### 5.1.4 Data quality requirement levels during a pilot- and data migration project

The data supplied by different market parties is checked against rules specified in advance in the data migration service. Data quality targets are separately set for each project milestone. Quality targets are different between a pilot project and an actual data migration project. A pilot project focuses on creating inspection rules and checking their functionality in the data migration process. In a pilot project, it is permitted for errors to remain in market party data, but this does not prevent moving to the next iteration stage. During the pilot project, the performance of the data migration process is also verified.

In a data migration project, market parties must ensure that data is corrected in the source system and that it acceptably passes the inspection. The permitted share of incorrect records at each milestone is specified based on experience received from the pilot project.

Inspection rules may also be dependent on a different stage of the data migration project. Checks carried out at different stages can be divided into three categories:

1. File check, migration file-specific independent check
2. Integrity check, check between migration files delivered by market party
3. Consistency check, check of data from all market parties for transfer to Datahub.

Source material is divided into three quality requirement levels in accordance with the table below.

**TABLE 9 SOURCE MATERIAL QUALITY REQUIREMENT LEVELS**

| Level | Description | Description |
|---|---|---|
| 1 | Necessary from Datahub's perspective | Data necessary from a perspective of the data standard's data model is given in a format accordant with the data standard.<br>Missing data causes rejection of the entire record. |
| 2 | Necessary from a perspective of electricity market operations | Data necessary from a perspective of Datahub business rules, such as conditionally mandatory data which is not mandatory from the data model's perspective.<br>Data in the wrong format is rejected. |
| 3 | Useful data, but not critical from a perspective of market and Datahub operations | Useful data from a perspective of electricity market functionality.<br>Data in the wrong format is rejected. |

Preliminary quality criteria for each data migration stage milestone in Datahub is presented in the table below. Milestones observe iteration stages, i.e. the next iteration stage is not moved to until the whole industry has achieved the quality criteria.

TABLE 10 SOURCE MATERIAL PRELIMINARY QUALITY CRITERIA BY MILESTONE

| Level | Description | T1 | T2 | T3 | T4 | T5 |
|---|---|---|---|---|---|---|
| 1 | Necessary from Datahub's perspective | 95.00% | 98.00% | 99.50 % | 99.90 % | 99.98% |
| 2 | Necessary from a perspective of electricity market operations | No requirement | 95.00 % | 98.00 % | 99.00 % | 99.50 % |
| 3 | Useful data, but not critical from a perspective of market and Datahub operations | No requirement | No requirement | No requirement | No requirement | No requirement |

### 5.1.5 Data to be inspected

For each field, it is checked that the field's data type, format and content correspond to the rules specified in the data standard. All errors found in the row in question are marked field-specifically in each data row. Entities to be inspected are specified in their entirety in the data standard. The estimated numbers of rows of data to be inspected are:

- Accounting point data: approx. 3.5 million rows
- Customer information: approx. 4-5 million rows
- Contract information: approx. 7.5 million rows
- Other basic data: thousands of rows.

There is more about metering data checking in Chapter . . The Datahub system checks that metering data is delivered to all active metering points, and that all metering data can be connected to some metering point.

## 5.2 Data migration service processes

The following processes are specified for the data migration service:

1. Import of source material. The process covers the importing, checks and reporting initiated by the service user.
2. Source material consistency check. The process covers the consistency checking and reporting of all basic data to be transferred to the Datahub system.

3. The passing of data to the Datahub system. The process covers the transfer to the publishing area of data to be passed to the Datahub system and the writing of data into the file format.

4. Data migration check. The process covers the checking of data migration reports imported by the Datahub system and the creation of final reports.

The processes are described in sections 5.2.1 - 5.2.4

### 5.2.1 The import of source material to the data migration service

A market party or its service provider creates a tool by which data can be imported from the source system in a format specified in the migration file instructions.

Market parties are offered a browser-based uploading tool for which each market party receives its own ID. The IDs are given to designated persons. Traffic between the data migration service and the user (client) must be encrypted. Alternatively, metering data can be delivered through an sftp connection.

The user can monitor the stages of import and inspection through the browser-based user interface (figure 4).

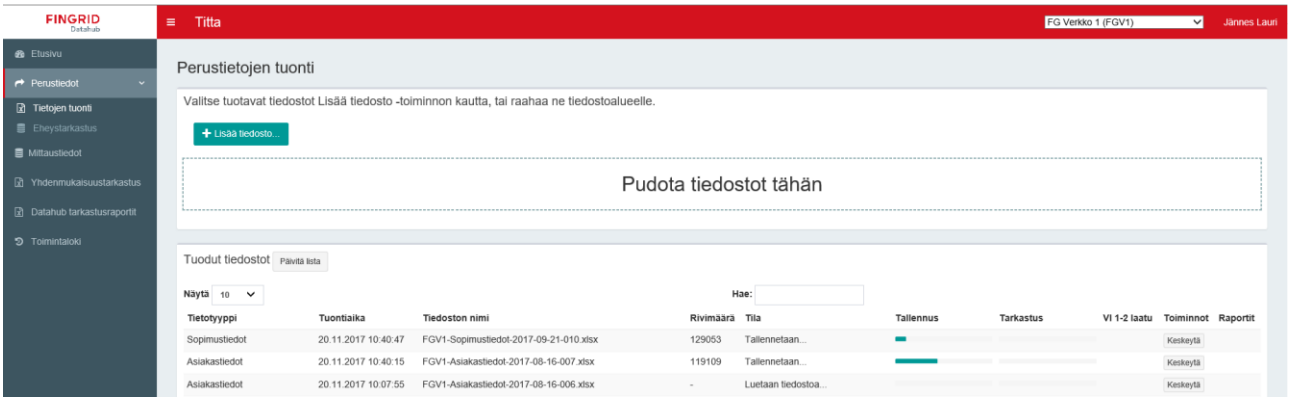


FIGURE 4 FILE IMPORT TO THE DATA MIGRATION SERVICE (CONCEPTUAL IMAGE)

#### 5.2.1.1 File checking

After import, the files are transferred automatically to the checking stage when the service performs a file check.

For each migration file, inspection rules that can be specified level-specifically are specified in the data migration service, depending on the criticality of the field from a perspective of Datahub or the electricity market. In a pilot project, inspection rules are specified, implemented and tested. The key reference-completenesses of migration files and inter-field dependencies between different migration files are not taken into account at this stage.

At least the following types of checks are carried out in file checking:

- A value has been entered into the field (at level 1 and 2)
- The value is in accordance with the value list if a value list has been specified
- The length of the value is less or as great as the maximum permitted field length, if it has been specified
- The field value is in accordance with the data type
- Field dependency from other field values it specified (mandatory if…)
- Identifying code (same value does not appear twice)
- Logical time interval checks (e.g. end time of validity later than start time)
- Register comparison (postal address register, company information register, etc.)
- Unambiguous periods of validity (no overlapping periods)

There are particular challenges related to the checking of accounting point address information. Many accounting points exist which have no address at all, or the address of some cannot be found in the postal address register because there is no postal service to that address. A way must be devised to identify accounting points for the data migration service, whose address information cannot be checked so that the system does not create a large number of needless errors.

The customer information check is another challenging area. Information about the same customer can be found looking different from different market parties. Exact processes must be specified for data cleaning instructions, by which the correct customer information can be established.

#### 5.2.1.2 Integrity check

Once a market party has delivered all mandatory migration files in terms of its role, reference-integrity checks can be carried out between migration files. For example, a customer specified in the contract must be found with a given ID from customer information imported to the data migration service. Comparison is targeted only at data uploaded by the market party itself. A supplier does not necessarily have at its disposal accounting point data, for example, referred to in the contract. Inspection rules are also created for fields whose value depends on the value of some other migration file field.

During the pilot project, inspection rules for data between migration files are specified, implemented and tested. The existence of errors is permitted in market party material, but the quality must be at a sufficient level for reliable results to be obtained from inspection process tests. Reference-completeness- and field dependency errors must be inspected and corrected in the source system. Inspection rules do not check data maintained in the system of another market party.


Eheystarkastukset Päivitä lista

| | | | Revisiot | | | | | | | | | Virheiden lukumäärät | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Käynnistysaika | Tarkastettu | Tila | Asiakas | KP-lisäos. | KP | Mitt.alue | Osapuoli | Rajapiste | Sopimus | Tuotantoyks. | Tuote | VI 1 | VI 2 | Raportti |
| 20.11.2017 13.48.21 | | Eheystarkastus käynnissä... | 8 | 12 | 146 | 112 | 1 | 111 | 11 | 115 | 110 | | | |
| 20.11.2017 09.21.48 | 20.11.2017 09.37.51 | Eheystarkastus tehty | 2 | 12 | 146 | 112 | 1 | 111 | 9 | 115 | 110 | 49615 | 0 | |
| 03.11.2017 12.16.24 | 03.11.2017 12.18.16 | Eheystarkastus tehty | 2 | 8 | 139 | 111 | 1 | 110 | 7 | 111 | 107 | 524 | 0 | |
| 03.11.2017 09.37.03 | 03.11.2017 09.37.05 | Eheystarkastus tehty | 1 | 8 | 138 | 110 | 1 | 110 | 6 | 110 | 106 | 11 | 0 | |

FIGURE 5 MONITORING OF THE INTEGRITY CHECK PROCESS

#### 5.2.1.3 Metering data check

The data migration service performs the following checks on metering data:

- Check of SAF file syntax
- Check of structural data
    - Has the metering point ID in an SAF file been imported to the data migration service in deliveries of basic data?
    - Has basic data import imported active metering points lacking metering data in SAF files?
    - Have series of both ‘in’ and ‘out’ been imported to the connection points?
    - Has metering data been delivered to a metering point throughout the period of validity? With regard to accounting points, the period of validity is equal to the validity of the grid agreement.

The data migration service informs the user about deviations observed in the inspection of structural data. In the solution description, the supplier must describe how the deviations are imported to the user.

A metering point may also be an accounting point, production unit or connection point. Metering data checks are basically run as a process started by the user in connection with integrity checks and only in the role of grid owner. A grid owner starts an inspection process once he/she has delivered both metering data and basic data to the service.

### 5.2.2 Source material consistency check

Fingrid initiates a Datahub-level consistency check when the parties have run integrity checks and the quality measured in the file and integrity checks are at a sufficient level for it to be expedient to run consistency checks.

The following checks are done as part of a consistency check:

- Reference-integrity checks (the accounting point ID in a supplier agreement can be found from the grid owner’s material)

- Unambiguous periods of validity (the same accounting point does not have contracts simultaneously valid between two different suppliers)
- Functional completeness (both sales and grid agreements at an accounting point, metering time series valid during the validity of contracts)
- Identifying codes (there cannot be two records with the same customer ID and type of customer code)

Inspection rules are already created and tested during the data migration pilot project but inspection rules can be reliably tested only during the data migration project. Only approved material is published in Datahub. Incorrect rows, whose individual fields contain data errors or there are errors in reference completeness, are basically not transferred to Datahub. The final approval of the source material is done at this stage.

A consistency check is not performed party-specifically, so the progress of its process will not be seen in the party's user interface.

### 5.2.3 The passing of data to the Datahub system

Once a market parties' data has passed inspection and meets the quality requirements specified for data approval (see ), the data is transferred from the data migration service to a separate publishing area. Datahub's system supplier uploads data from the publishing area to fields and tables based on the Datahub database data model. The technical specification of data transfer between the publishing area, the data migration service and Datahub is done together with the Datahub system supplier. After Datahub's data uploading, the Datahub system creates so-called data migration reports, which are returned to the data migration service. The data migration reports contain all data uploaded to Datahub market party-specifically and migration file-specifically.

The data migration service publishes the data migration reports for the market parties, and creates a data migration final report. The market parties can compare the data in the data migration reports with the data in the source systems, and thus verify that the data in Datahub and the source systems is consistent.

The source system administrators also check data from Datahub as spot checks to ensure that the data has gone to the correct fields in Datahub. Data checking is done through a browser-based user interface, which can be opened by each market party through user specific IDs. The spot checks will be specified in greater detail in the data migration project, once the Datahub system is available. The results of the spot checks are reported to Fingrid.

The metering data from the metering points (accounting points, production units and connection points) is conveyed directly to the Datahub system, and the data migration service checks the data itself and acts as a transmission platform for the files. The Datahub system retrieves metering data from the data migration service's publishing area.

Metering data checking requires that basic data is imported to the Datahub system. Datahub performs the following checks on the metering data:

- Metering data is found from the entire period of validity of the accounting point's grid agreement, if the method of metering is hourly
- Metering data is found throughout the period of validity of the production unit
- Metering data is found throughout the period of validity of the connection point
- All metering data is collected to a basic data structure (there are no 'orphan' time series)

Datahub performs hourly imbalance settlement calculations and the following calculation results are used in the checking of metering data:

- Metering grid area-specific losses
- Supplier-specific total series by metering grid area

### 5.2.4 Data migration check

The data migration inspection process covers the following functions:

- the import of Datahub data migration results to the data migration service
- the publishing of Datahub data migration results to market parties
- the comparison of Datahub data migration results to published material
- the creation of a data migration final report

Once Datahub has delivered all the reports, the data migration service administrator starts the comparison of the data uploaded to Datahub against data already passed to Datahub.

## 5.3 Datahub's reporting of uploading results

The Datahub system returns the basic data uploaded to the data migration service in full by party and by source material type for all source material types except party information and metering grid area data, about which Datahub creates only one report covering all parties/metering grid areas. The data is returned in xlsx format in accordance with the migration file instructions. The files imported by Datahub are imported to the data migration service, where it is checked that the data uploaded to Datahub corresponds to the data already passed to the Datahub system. Based on inspection results, the data migration service produces the reports described in sections  and  .

With regard to metering data, Datahub delivers the following reports by grid owner to the data migration service:

1. A list of accounting points, production units and connection points missing all or some metering data during the period of validity of the grid agreement
2. Metering time series, which Datahub was unable to connect to a basic data structure

3. Metering grid area-specific loss series
4. Supplier-specific total series by metering grid area

Datahub does not therefore return uploaded measurement data back to the data migration service.

## 5.4 Monitoring and monitoring tools

During the import and checking of migration files, the end user can monitor the progress of the process from a user interface. The system also publishes for its users different reports through the user interface at different stages of data migration. The system publishes its own reports for end-users and the administrator.

### 5.4.1 Import and inspection monitoring

The end user can monitor the progress of the import and inspection of migration files using the progress bars of the user interface and detailed data. Figure 6 shows and end user's monitoring screen.

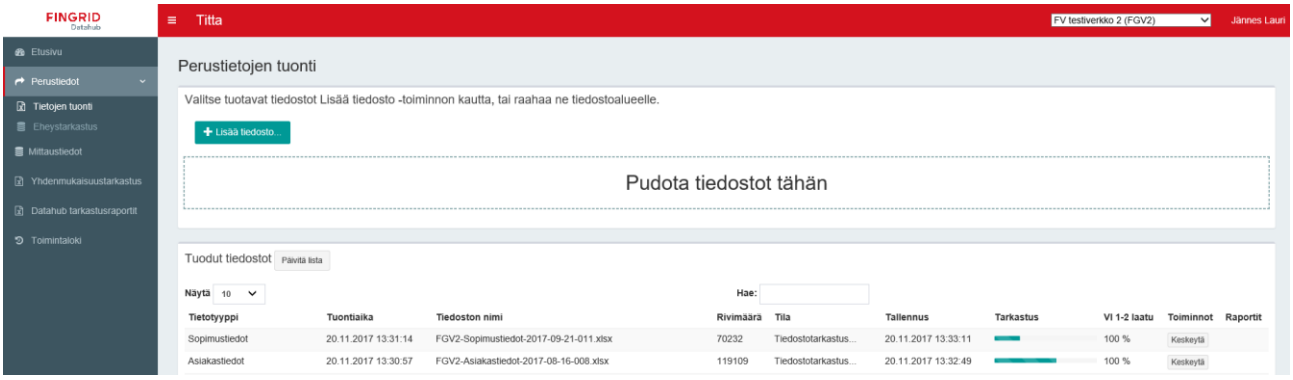


FIGURE 6 MIGRATION FILE IMPORT AND INSPECTION. CONCEPTUAL IMAGE OF USER INTERFACE.

### 5.4.2 End-users reports

#### 5.4.2.1 Inspection summary report

From the browser-based user interface, market parties can check the situation with the delivery and inspection of migration files. The summary report contains quantitative and qualitative data from the most recently imported migration files. From the user interface, it is possible to upload error reports, which contain detailed data about errors and their amounts in xlsx format for selected migration files. The figure below is an example of a market party's summary report.

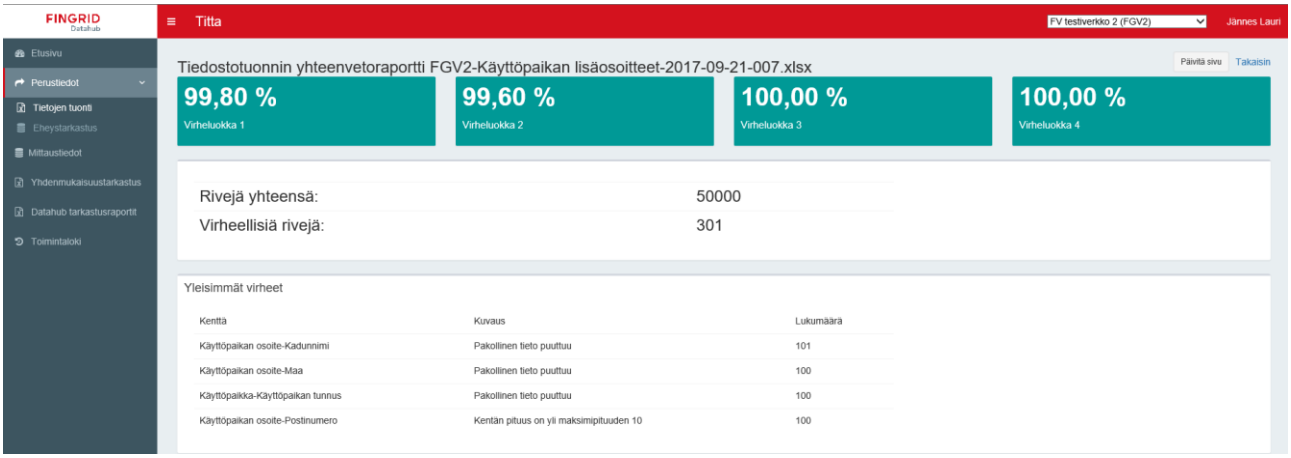


FIGURE 7 MARKET PARTY'S SUMMARY REPORT

#### 5.4.2.2 Inspection error reports

The end user can check errors that have occurred in Datahub loading in detail using error reports produced by the system. The reports are in xlsx format and are available from the end user's user interface There are three kinds of report:

- File inspection error report
- Integrity check error report
- Consistency check error report

In addition to an actual error report, the service produces a summary report of errors observed. The user can monitor the progress of the inspection from a summary report that updates in real-time.

Using error reports, the parties carry out corrections in source systems. The reports preliminarily contain the following columns:

TABLE 11 ERROR REPORT COLUMNS.

| No. | Column | Description |
|---|---|---|
| | **Standard columns** | |
| 1 | Migration file | Name of migration file |
| 2 | Row number | Migration file row where the error was observed |
| 3 | Quality requirement level | Classified into levels 1-3. The quality requirement level indicates to what quality requirement level the error is calculated |
| 4 | Error code | The error code indicates the type of error. Error types are listed in an inspection rule document published during the pilot project. |
| 5 | A description of the error | A description of the error in plain language |
| 6 | Field | Field where the incorrect data was found. |

| | | |
|---|---|---|
| 7 | Incorrect data | Content of incorrect field |
| 6 | Suggestion for correction | System's suggestion for correction. Only written if the field's correct value can be deduced, otherwise the field is left blank. |
| | **Migration file-specific columns** | |
| 7...n | <Migration file fields> | Fields dependent on migration file type. The values of an incorrect row are written as they are from the checking area to the error report. Rows rejected in the syntax check cannot be found in the checking area so they are not written in the error report.<br>Please note that the same row of a migration file appears several times in an error report, if several errors are found in that row. |

#### 5.4.2.3 Data migration result reports imported by Datahub

Data migration result reports are reports imported by the Datahub system and described in section by which the market parties can compare data content saved in Datahub to data content in the source system. Datahub creates reports by party and by source material in xlsx format, and these are available from the end user's user interface.

The grid owner downloads reports from the data migration service user interface, compares the results of the imbalance settlement with the results calculated from its own system and establishes the reasons for errors.

#### 5.4.2.4 Administrator's reports Migration file delivery statistics

A migration file delivery statistics report is the administrator's tool for monitoring parties' migration file deliveries and, through it, the administrator is able to monitor market party deliveries by party- and source material type.

#### 5.4.2.5 Party-specific quality statistics

Using a source material party-specific quality report, Datahub's administrator can check the quality of data delivered by market parties by quality requirement level.

#### 5.4.2.6 Source material quality report at Datahub level

A source material quality report at Datahub level is an administrator's tool for monitoring the overall quality of source material. The report presents the quality of source material by source material type and quality requirement level.

#### 5.4.2.7 Data migration final report

The data migration final report is a summary of the results of data migration. The report shows the numbers of rows delivered by source material type and the number of missing rows or rows with deviations.

#### 5.4.2.8 Data migration deviation report

The data migration deviation report contains detailed information about deviations observed in the comparison of data published in Datahub and Datahub's data migration reports.

## 5.5 Data migration process performance

Particularly at the Datahub commissioning stage, the data migration service performance and the lead time for the whole data migration process are critical. The systems must process large masses of data, and there may be 300 simultaneous users. Table 12 lists each stage of the data migration process, calculated requirements set for performance and the number of simultaneous sessions.

Note that this plan does not set performance requirements in relation to data volume. In practice, this means that the picking tools of large systems must be more effective than the picking tools of small systems.

TABLE 12. PERFORMANCE REQUIREMENTS FOR THE DATA MIGRATION PROCESS

| | Function | Number of simultaneous sessions | Time |
|---|---|---|---|
| **Source systems** | | | |
| 1 | Data picking from market party system | | 1 d |
| **Data migration service** | | | |
| 2 | Import of an individual migration file to the data migration service | 200 | 30 min |
| 3 | Checking of the data in an individual migration file against data standard specifications | 200 | 2 h |
| 4 | Integrity check of source material delivered by one market party | 200 | 2 h |
| 5 | Start of inspection process after import stage | 200 | 10 min |
| 6 | Migration file-specific summary report and a report available after completion of inspection | 200 | 15 min |
| 7 | Consistency check of source material of all market parties | 1 | 4 h |
| 8 | Production of up-to-date Datahub-level quality report | 1 | 30 s |
| 9 | Publication of all the material for uploading by the Datahub system | 1 | 30 min |
| **The Datahub system** | | | |
| 10 | Data uploading from the publishing area to Datahub | 1 | 12 h |
| 11 | Creation of Datahub data migration reports | 1 | 4 h |

| | Function | Number of simultaneous sessions | Time |
|---|---|---|---|
| **Data migration service** | | | |
| 12 | Overall duration of import of Datahub data migration reports | 200 | 2 h |
| 13 | Creation of a data migration final report | 1 | 30 min |

## 5.6 Change management

In each data uploading iteration, in a migration file a market party always delivers all the rows based on basic data, not only the changed rows. Each uploading and its related check are performed independently. This facilitates the import of data to the data migration service, because the system does not need to check whether the data has changed compared to the previous upload. From a market parties' data system, data can always be extracted with the same tool, i.e. There is no need to differentiate which data has changed between the two latest deliveries.

With regard to metering data, a market party delivers new and changed data after the main upload.

# 6 Data security

The data migration service's data security solutions must be in line with the data security requirements of the Datahub system.

With regard to the data migration service, the following specifications apply:

- User IDs are personal and logging into the system requires strong identification
- A data migration partner (or Fingrid) creates user IDs and connects them together or to several market parties that have registered for the system
- A migration file and every data row of a migration file are connected to a market party
- The system only allows the import of the data of registered parties to the data migration service, and the user can only deliver data from market parties to which a user ID is linked. The system also stores data from a user who has supplied a migration file.
- Deviation reports are also connected to a market party and the system only offers the user the deviation reports of connected market parties.
- Normal users (market party users) have access to the system only through a browser-based user interface
- Normal users do not have the opportunity to edit data that exists in the data migration service
- All data traffic is encrypted in accordance with the latest standards of the Data Protection Act
- Data migration service data security will be verified through data security auditing before the service is opened to the industry.

# 7 Data protection

In data migration, the same data protection requirements apply as in Datahub's business processes. The document "Electricity retail market business processes in Datahub" describes data protection requirements in the following way:

*An essential part of managing customer and metering point information is the protection of information belonging to individuals registered with Datahub. This refers to the protection of people's private lives. The design of Datahub and market processes was carried out on the premise that all information that can be linked to a customer is personal information. This information is personal information regardless of whether the information can be linked to an individual person in Datahub. For example, the address of a metering point is personal information regardless of whether the name of the person or a person's ID number is stored in Datahub. What makes the metering point address personal information is the fact that the customer's address is relatively easy to find out. This also applies to situations in which the customer does not live at the metering point address.*

*Market processes are designed in such a way that only information necessary for market processes is stored in Datahub, and parties may only search Datahub for information or receive relayed information in accordance with their predefined permissions. These permissions depend on the party's role, agreement status and existing authorisations.*

Within the scope of the data migration service, Fingrid acts in the role of processor of personal data. The data is transferred to the Datahub system is personal data register when the system retrieves the data from the data migration service.

# 8 Appendices

Appendix 1: Migration file instructions. https://www.ediel.fi/en/datahub/information-conversion/migration-file-instructions

Appendix 2: Preparation of the industry. https://www.ediel.fi/en/datahub/information-conversion/instruction