

2 July 2020

Testing and Certification Plan

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Change history

Date	Version	Change
18 January 2019	0.1	Version for the go-live working group's comments.
15 February 2019	0.2	Version for industry comments.
22 March 2019	1.0	First official version.
12 July 2019	1.1	Added detail to sections 2 and 3
2 July 2020	1.2	Sections 2, 3 and 4: updated the wording, harmonised the terminology, and corrected spelling mistakes. Section 2: updated the obligations of the party, added the use of the testing service Section 3: updates including contents of the testing phases, descriptions and schedules of the test cases. Added section 3.3.2.

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1 Introduction

The Electricity Market Act obligates retailers and distribution network operators to ensure that their information systems and data transmission systems are compatible with the information systems used for the centralised information exchange system (Datahub). The compatibility stipulated in the Act must be achieved before the Datahub is in production use. The compatibility of systems will be ensured by means of testing and certification.

Fingrid is testing the Datahub information system with the supplier of the Datahub system. The testing of the Datahub system ensures the information security and data protection of the system, the functionality of processes, the efficiency and accessibility of functions and services, and the functionality of user interfaces and APIs.

Verifying the compatibility of market parties' systems with the Datahub system consists of stakeholder testing and production trials. During stakeholder testing, the parties test the functionality of their system implementations and APIs, as well as their ability to use the Datahub correctly, and they ensure that their business processes function from end to end. Verifying functionality in product use includes certification, trial operation in production, and go-live exercises. Certification is a means of verifying the party's readiness to use the Datahub in production. After certification, the party may begin production trial run to ensure the effective production operation of systems and the market. Following a successful production trial run and the parties' own go-live tests, a go-live rehearsal will be conducted, covering the entire market.

This testing and certification plan describes the testing and production operation verification of Datahub stakeholders. The plan will be updated as the Datahub go-live process continues.¹ If necessary, updated instructions and technical documentation will be published to support testing.

¹ Go-Live Plan for centralised information exchange services for electricity trade
(<https://palvelut.datahub.fi/api/documents/file/0-233038-1-295829>)
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2 Planning of testing by market parties

The market parties must plan and describe their own testing as part of their go-live plans². The plan should describe matters such as the arrangements for system implementation and integration testing, schedules, test environments, approval procedures, and processing of defects and deviations. At a minimum, the testing phases for inclusion in each party's plan are system testing by the party, stakeholder testing, market party certification, production trial runs, go-live testing, and a final rehearsal for the go-live. The plan should also take into consideration the involvement of the party's system vendors in integration testing and system certification.

The party should plan and describe the following matters, among others, in relation to its testing:

- Datahub integration testing for its own system implementation
 - Test planning, management, and monitoring of results
 - End-to-end testing of its own business processes
 - Applying the use cases provided by Fingrid³ to its own system implementation
 - Testing the use cases supported by Fingrid's testing service
 - Producing the necessary material and importing it into the system during various phases of testing
 - The architecture of the test environment and the differences from the production environment
 - Processing defects and deviations detected during testing
- Ensuring data protection and information security during the various phases of testing
- Testing in phases corresponding to the testing and certification plan
 - Preparations for each phase
 - Installing software
 - Building environments

² Instruction for market parties on how to create a go-live plan for centralised information exchange services for electricity trade (<https://palvelut.datahub.fi/api/documents/file/0-227060-1-287094>)

³ Use cases for Datahub certification (<https://palvelut.datahub.fi/api/documents/file/0-228857-1-289236>)

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- Connections
- Test data
- Agreement on the use of Fingrid's test environments
- Commissioning of Fingrid's testing service
- Planned timetable and the matters for testing in each phase
 - Testing of the party's systems
 - Stakeholder testing
 - Market party certification
 - Production trials runs
 - Go-live testing
 - Final go-live rehearsal
- Approval procedures for various phases
 - Monitoring and reporting
- System implementation testing by system vendors
 - Monitoring and reporting
 - Approval procedures
- Datahub integration testing by the system vendor
 - Monitoring and reporting

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3 Testing and certification

Testing related to the Datahub go-live is divided into system testing, stakeholder testing and verification of production operation (certification, production trial runs and final rehearsal of go-live).

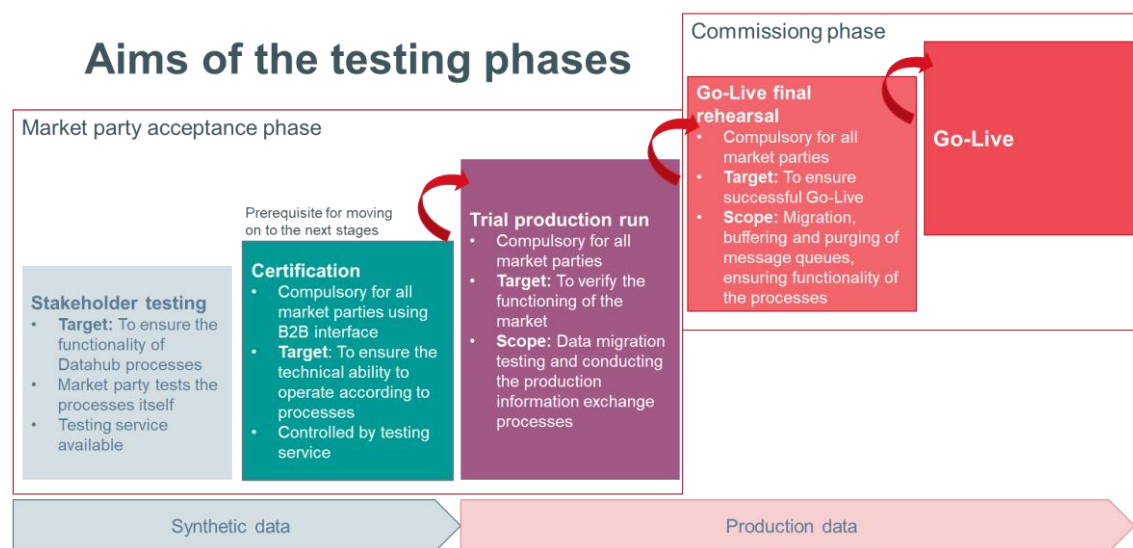


FIGURE 1 AIMS OF THE DATAHUB TESTING PHASES

3.1 System testing

Fingrid tests the Datahub system in cooperation with the Datahub system vendor and the data migration service provider. The purpose of testing the Datahub system is to ensure that the Datahub functions and that stakeholder testing and verification of production operation can begin.

Every market party must ensure that its system implementation is functional and ready for Datahub integration testing before the stakeholder testing phase begins.

Before stakeholder testing begins, each party must ensure the following:

- The party has tested its own system and internal integrations
- The Datahub test environments are ready
- A Datahub testing agreement has been made
- The necessary data and material have been transferred to the systems
- The data protection and information security of the test environments and operating methods have been verified
- The connections to the Datahub test environment have been verified
- The use cases provided by Fingrid have been adapted for testing the party's own systems
- The party is ready to test its own business processes

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3.2 Stakeholder testing

The purpose of testing by stakeholders (parties to be integrated into Datahub) is to ensure that the parties' Datahub integrations function, verify the ability to use the Datahub system correctly, and ensure that the parties are ready to begin testing the Datahub in production trial runs. During stakeholder testing, each market party tests the Datahub processes itself while the actions of other parties are implemented via the Datahub user interface or simulated. Testing between parties is possible, and the parties may choose to agree on such testing and the necessary measures independently. Extensive testing between parties is not planned for the stakeholder testing phase.

Fingrid has assembled a group of stakeholders for pilot testing. The purpose of testing with a pilot group is to enable testing of Datahub integrations into the parties' systems at the earliest possible stage, obtain further assurance of the functionality of the Datahub's critical functions, and conduct go-live rehearsals. A further aim of the pilot group's activities is to improve and elaborate on the test cases and the certification use cases.

During stakeholder testing, the market parties have the opportunity to use Fingrid's testing service⁴ to test their Datahub integrations. Fingrid's testing service guides the testing of use cases, prepares the necessary data to Datahub, and acts in the roles of other market parties (counterparties) if necessary. However, the testing service cannot be used to test the end-to-end functionality of all use cases. The parties must ensure that all their business processes function, regardless of the testing service.

The parties must be capable of commencing stakeholder testing according to the schedule set out for the Datahub go-live milestones⁵.

3.3 Verifying production use

3.3.1 Market party certification

Market party certification is used to verify and document that the services and systems of the market parties are compatible with the Datahub and that each party has the technical and formal capacity to start using Datahub in their respective role. Prior to certification, the parties must ensure and demonstrate their readiness to begin certification. The parties may test some or all of the use cases related to certification in the Datahub's test environment before certification begins. The successful completion of stakeholder testing supports the party's capacity to complete certification quickly and effectively. Parties that only use the Datahub user interface do not need certification.

⁴ Datahub webinar, 15 November 2019 (https://www.youtube.com/watch?v=swHN87nN2hs&feature=emb_logo)

⁵ Datahub go-live milestones for market parties (<https://palvelut.datahub.fi/api/documents/file/0-233040-1-295831>)

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The use cases for role-based certification will be formulated from the use cases for stakeholder testing delivered by Fingrid to the parties. During certification, the party must acceptably conduct the use cases for the roles in which the party will act in Datahub.

Fingrid implements a testing service⁶ (Tepa) for implementation and monitoring of certification. The service transfers the use cases to the Datahub, reports the material used in use cases to the party, and simulates the duties of the other roles required for the use cases. The party must transfer the use cases to its own systems in accordance with the material provided by the testing service. The service also contacts the Datahub to verify the status of the processes conducted during the use cases and reports them to the party and Fingrid.

Certification is a prerequisite for the commencement of the production trial run and full production use.

3.3.2 System certification

The system solutions used by market parties must be certified before the market parties can begin the trial production run. System vendors can proceed in their system certification processes in phases, in the same way as for market parties. The certification use cases will be available for the system vendors to test before market party certification begins.

3.3.3 Production trial runs

Certification is a prerequisite for participation in the production trial runs of the Datahub processes.

The production trial runs seek to ensure that the foundations are in place for efficient electricity markets and verify the functionality of markets in a centralised data transfer environment. Production trial runs initially verifies that data migration is suitable for production. Following data migration, actual production transactions occurring on the market are implemented in the Datahub environment in production trial runs. There will be two production trial runs, and each trial run will last approximately two weeks. Limiting the duration minimises the risk of personal data coming or remaining under the control of the party without justification. Production trial runs will also verify that the connections between the parties' and the Datahub production systems function as required.

Preliminary scope of the production trial runs:

- Data migration
- Collection of metering data and delivery to the Datahub
- Imbalance settlement and comparison of results with the eSett data
- Transfer of metering data to suppliers

⁶ Datahub webinar, 15 November 2019 (https://www.youtube.com/watch?v=swHN87nN2hs&feature=emb_logo)
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- Implementation of production transactions
 - All market parties

3.3.4 Go-live testing and final rehearsal

The go-live testing and final rehearsal seek to verify the functionality of the go-live process for centralised data transfer. The market parties must plan, test, and practise their own actions for the Datahub go-live before the final rehearsal begins.

When the parties' go-live tests have been completed and the trial production run has provided sufficient assurance that the markets are ready for the Datahub go-live, a final rehearsal of the Datahub go-live will take place covering the retail markets in the entire industry to verify the detailed actions to take during the go-live phase.

Preliminary scope of the final rehearsal

- Full-scale data conversion and migration to the Datahub
- Simulation of the buffering of market transactions
- Simulation of the buffering of metering data
- Datahub "smoke tests"
- Ramp-up of Datahub processes (purging buffers)
- Ensuring the functionality of processes

3.4 Test environments

The Datahub system offers stakeholders a test system with the same functionality as the production system for testing use. Before using the test environment, parties must make a testing agreement with Fingrid Datahub Oy on the use of the test environment.

Any market party that intends to use the Datahub's messaging interface requires a test system and environment that is separate from the production environment in order to test the systems and ensure compatibility. Market parties' test environments must be integrated into the Datahub. In other words, the environments must be able to communicate with the Datahub in a technically identical manner as for the future production system.

The use of Datahub's messaging interface requires that the system connected to the interface is identified using a digital certificate. The market parties must procure and install certificates in test environments in accordance with instructions provided by Fingrid.

It must be possible to import a copy of the production system data into the environment used during the trial production run and go-live verification. The environment containing production data must have the same standard of information security and data protection as the production system, and the parties must ensure that access to their environments is managed in a corresponding way as in production. It must also be possible to delete material containing personal data from the system when the planned use has ended.

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When the trial production run has ended, the production material may no longer be used in Datahub test environments.

The market parties' go-live plans must describe:

- Specification of the test environments
- Setting up or procuring test environments
- Use of test environments in different phases of testing
- Protection of test environments
- User management in test environments
- Schedule for the go-live and use of test environments

Parties may use one or more test environments as applicable to their operations.

3.5 Test and use cases

The parties are responsible for their own test cases, which are designed to ensure the functionality of the party's system entity, the continuity of business processes, the functionality of systems, and the party's readiness to begin production use of Datahub.

Fingrid provides stakeholders with Datahub use cases related to Datahub processes, and the parties may use these cases in their testing. The use cases are described at Datahub process level, and the parties must adapt them to test their own operations and systems. The use cases provided by Fingrid do not cover all possible market scenarios; each party must ensure that its own tests are comprehensive enough to verify its business processes.

The use cases were developed together with the system vendors and a pilot group of market parties, and they were published for commenting by market parties. The use cases are prioritised from the business perspective together with the market parties. The use cases form the basis for the certification use cases.

3.6 Test material

Only anonymised or synthetic material is used for testing during the development phase of the Datahub system.

The parties are responsible for their own tests, test materials, and test environments. No real or pseudonymised personal data⁷ is included in the material used during the Datahub stakeholder testing phase. Only synthetic data may be used for stakeholder testing. Synthetic test data means artificially generated data to which the Data Protection Act does not apply.

⁷ Office of the Data Protection Ombudsman (<https://tietosuoja.fi/mika-on-henkilotieto>)
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The parties must produce their own data for testing. Fingrid will not provide parties with test material. Enough material must be used in the stakeholder testing phase to test the functionality of different processes and functions. The precise amount of data required depends on the aims of the party's tests and the operating methods. There is no need for comprehensive, production-scale data in the stakeholder testing phase. The data used for Datahub integration testing must conform to the data standard, and the identifiers (EIC, GLN, GSRN, social security number, etc.) must be correctly formed. The parties' go-live plans must describe the production of test material and data management.

The testing service generates material for the individual use cases used for certification and delivers the material to the party (user interface, Datahub message). The parties must supplement the material themselves and transfer it to their systems as application.

During verification of production use, it may be justified to use production material to verify production operation. In such a case, the data protection and information security of the systems and services must correspond to the standard required for production use. The compatibility of parties' systems with Datahub must be verified through certification, and the parties must be ready to commence production use. After this phase, the material must be deleted from the systems.

Separate written instructions will be provided concerning the use of production material. Parties may use a different environment to process synthetic and production data.

The processing of personal data in accordance with the General Data Protection Regulation⁸ must be taken into consideration during every testing phase and described in the party's go-live plan.

3.7 Test observations

Any observations made during stakeholder testing and verification of production use should be sent to Fingrid via the Datahub service portal. More detailed instructions and operating methods for reporting observations will be provided later. Fingrid processes the observations reported by parties and specifies the necessary measures to address them.

Efforts are made to publish known defects and deviations in Datahub test environments, so they are available to stakeholders as quickly as possible to enable parties to take them into consideration in their tests and avoid reporting duplicate observations. The defects corrected in new versions of the system and the system changes are described in the release notes⁹.

⁸ EUR-Lex, Regulation (EU) 2016/679 of the European Parliament and of the Council (<https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=CELEX%3A02016R0679-20160504>)

⁹ (Datahub External Interface Specification) (<https://palvelut.datahub.fi/api/documents/file/0-228849-1-289228>)
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3.8 Schedule for system implementation

The system's business processes will be developed and implemented in six phases.

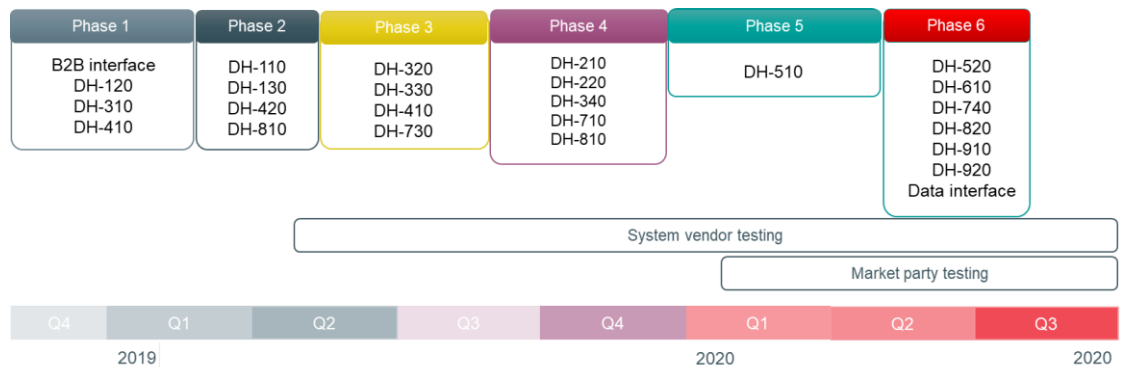


FIGURE 1 SYSTEM IMPLEMENTATION PHASES

3.9 Schedule for testing and certification

The schedule for Datahub testing and certification is described in Figure 3 and Table 1. Parties must describe their own testing schedules in their go-live plans.

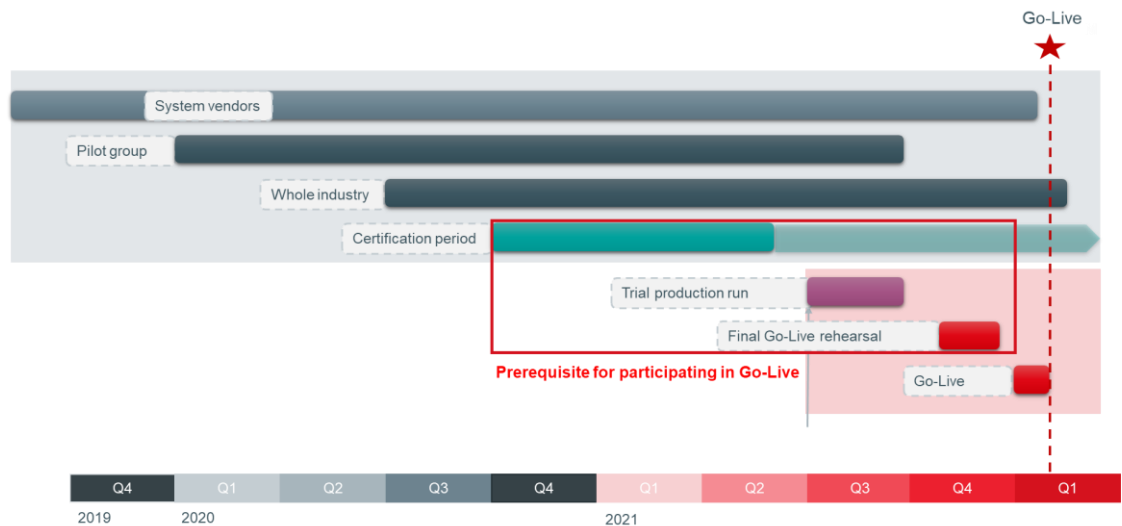


FIGURE 2 SCHEDULE FOR TESTING AND CERTIFICATION

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TABLE 1 PRELIMINARY SCHEDULE FOR TESTING AND CERTIFICATION

Event	Target (achieved)	Comments
Description of the interface solution and preliminary versions of the interface documentation for commenting	Q4/2018 (12/2018)	Preliminary versions published for system suppliers 12/2018
Detailed versions of interface descriptions	First version Q1/2019 (02/2019)	Version 1.7 02/2019 Version 1.8 05/2019 Version 1.9 07/2019 Version 1.10 11/2019 Version 1.11 12/2019
Preliminary description of the certification procedure	Q1/2019 (06/2019)	See section 3.3.1 See Datahub update seminar 06/2019
First parts of the Datahub test system available for testing by system suppliers	Q2/2019 (04/2019)	Phase 1, 04/2019 Phase 2, 06/2019 Phase 3, 09/2019 Phase 4, 12/2019 Phase 5, 04/2020 Phase 6, 09/2020
Testing by the stakeholder pilot group starts	01/2020	Datahub test environment available to the pilot group 08/2019
Plan and description of the certification procedure and certification use cases for stakeholder groups.	Q1/2020 (11/2019)	See Datahub webinar, 15 November 2019 Certification use cases published 11/2019
Parties' messaging traffic to the test environment verified no later than	09/2020	Message transfer between the test system and parties' test systems before 1 October 2020.
Datahub test environment open for stakeholder testing	06/2020	Stakeholders are able to begin testing

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The testing service (Tepa) is opened to market parties	06/2020	Possibility to use the certification service
System certification for system vendors begins	Q3/2020	System certification is a prerequisite for the production use of Datahub.
Market party certification begins	1 October 2020	Certification is a prerequisite for the production use of Datahub
Parties set up data structures on the Datahub (first-class use cases completed acceptably)	1 November 2020	DSO: establishment of an accounting point and confirmation of a grid agreement. Supplier: Creating a sales agreement
Business-critical use cases certified (second-class use cases completed acceptably)	1 February 2021	See Certification use cases ¹⁰
Business-relevant use cases certified (third-class use cases completed acceptably)	7 April 2021	See Certification use cases
System vendors must have completed system certification	7 May 2021	System certification is a prerequisite for the production use of Datahub.
All parties must be certified	7 May 2021	Certification is a prerequisite for the market party's production use of Datahub.
The market party is ready to start production trial run I	7 June 2021	Milestone criteria are fulfilled
Production trial run I starts	06/2021	Certification is a prerequisite for the trial production run.
The market party is ready to start production trial run II	7 September 2021	Milestone criteria are fulfilled
Production trial run II starts	09/2021	Certification is a prerequisite for the trial production run.
The market party is ready to start the final go-live rehearsal	7 November 2021	The parties have completed their own production go-live tests.
Final go-live rehearsal	11/2021	Prerequisite for go-live

¹⁰ Use cases for Datahub certification (<https://palvelut.datahub.fi/api/documents/file/0-228857-1-289236>)
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4 Communications

The main communication channel for matters related to testing and certification is the EDIEL.fi portal for the Datahub project.

The following objectives have been set for communication on testing and certification:

- Communication should support the achievement of the testing and certification targets
- The instructions and policies related to testing and certification should be provided to the parties that need them at the right time and in a sufficient number of channels
- Communications are open, interactive and easy to understand

Depending on the requirement, communications should be implemented as public communications to the entire industry or targeted communications for a certain group of parties; for example, via the forum for system vendor. The communication channel should be selected according to the matter communicated. The channel should reach the target group as effectively as possible; e.g., webinars, instant messages (Slack, etc.).

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