

BRS

(Business Requirement Specification)

For

Nordic Balance Settlement

**A market model for data exchange
between eSett and TSOs/Market
Operators**

Business process: Nordic Balance Settlement for
TSOs and Market Operators
Version: 3.2.A
Status: Approved by NMEG
Date: April 9th, 2024

Content

1	Introduction	4
1.1	Background	4
1.2	Nordic Energy Domain Model	4
1.3	Project organisation	4
1.4	Terms and notations used in this BRS	4
1.5	References	4
1.6	Change log	5
2	Overview of the Nordic energy market domain	12
2.1	Settlement in the overall context (Domain model)	12
2.2	Breakdown of the settlement phase	12
2.3	Overview of information exchange for the NBS scheduling phase	13
2.4	Overview of information exchange for the NBS metering, settlement and reconciliation phase	16
3	Harmonised roles used in Nordic settlement system	16
4	Process areas within Nordic settlement system	17
4.1	Process area: Receive and validate Master Data	17
4.2	Process area: Master Data	17
4.3	Process area: Exchange Load Profile Shares	17
4.4	Process area: Report trade from Day-ahead and Intraday	17
4.5	Process area: Report bilateral trade	19
4.6	Process area: Plan production	19
4.7	Process area: Report trade from Balance Regulation Market	20
4.8	Process area: Exchange metered data for imbalance settlement	21
4.9	Process area: Report balancing services	21
4.10	Process area: Distribute settlement basis data	21
4.11	Process area: Settle imbalance	21
4.12	Process area: Reconcile	21
5	Business Data View	22
5.1	ENTSO-E ESS Schedule document	23
5.1.1	<i>Class diagram: ENTSO-E ESS Schedule document</i>	23
5.1.2	<i>Attribute usage: ENTSO-E ESS Schedule document, Bilateral trade</i>	24
5.1.3	<i>Attribute usage: ENTSO-E ESS Schedule document, Day-ahead/Intraday trade</i>	26
5.1.4	<i>Attribute usage: ENTSO-E ESS Schedule document, Day-ahead/Intraday flow</i>	28
5.2	ENTSO-E ERRP Planned resource schedule	30
5.2.1	<i>Class diagram: ENTSO-E ERRP Planned resource schedule</i>	30
5.2.2	<i>Attribute usage: ENTSO-E ERRP Planned resource schedule</i>	31
5.3	Ediel ERRP Reserve Allocation Result Document	33
5.3.1	<i>Class diagram: Ediel ERRP Reserve Allocation Result Document</i>	33
5.3.2	<i>Business rules:</i>	34
5.3.3	<i>Attribute usage: Ediel ERRP Reserve Allocation Result Document</i>	34
5.3.4	<i>Dependency matrix: Ediel ERRP Reserve Allocation Result Document</i>	39
5.4	Ediel ECAN Publication Document	42
5.4.1	<i>Class diagram: Ediel ECAN Publication document</i>	42
5.4.2	<i>Attribute usage: Ediel ECAN Publication Document</i>	44
6	Acknowledgements	46
6.1	NBS requirements for acknowledgements	47
6.1.1	<i>All or Nothing Principle</i>	47
6.1.2	<i>Positive acknowledgements</i>	47
7	Technical business rules	48
7.1	Time Series Identification (Time Series ID)	48
7.2	Usage of Resolution and Position	48

Appendix A Identifying sender and recipient in communication headers49

1 Introduction

1.1 Background

The Nordic Balance Settlement (NBS) is run by [eSett](#), while the Nordic Market Expert Group (NMEG) is responsible for the development and maintenance of the Business Requirement Specifications (BRS) and User Guides for the NBS processes.

This document is a Business Requirement Specification (BRS) for the Nordic Balancing System, detailing the document exchanges. The focus of the document is the business aspects of the document exchanges and the basis for the documents to be exchanged are the ENTSO-E Implementation Guides, see [1]. In addition, the Harmonised Electricity Market Role Model from ENTSO-E, ebIX® and EFET, see [3], is used for identifying the relevant roles used in the BRS.

There is a separate BRS for data exchanges between NBS (eSett) and the actors in the Nordic downstream energy market, such as Balance Responsible Parties, Energy Suppliers (Retailers) and the data hubs, see [7].

The first part of the document, chapter 2, 3 and 4, describes the business processes relevant for data exchange within the Nordic Balance Settlement (NBS) process area. In chapter 5, Business Data View, the documents that will be exchanged between NBS and the market actors are described in detail.

1.2 Nordic Energy Domain Model

A Nordic Energy Market Domain model, giving an overall overview of the structure and processes used in the Nordic Energy market, can be found in [6].

1.3 Project organisation

The project is organised as a project group within the Nordic Market Expert Group.

1.4 Terms and notations used in this BRS

Documents are described by a class diagram showing the full set of attributes in the related xml schema. In addition, the usage of the document is described by one or more tables detailing the usage of each attribute. Optional attributes from the class diagram, not used in the specific data exchange, are omitted from the table.

1.5 References

- [1] ENTSO-E implementation guides, see [ENTSO-E Electronic Data Interchange \(EDI\) Library](#), e.g.:
 - ENTSO-E Modelling Methodology (EMM)
 - ENTSO-E UCTE SO-SO Process
 - ENTSO-E Scheduling System, ESS
 - ENTSO-E Settlement Process, ESP
 - ENTSO-E Reserve Resource Planning, ERRP
 - ENTSO-E Capacity Allocation and Nomination System, ECAN
 - ENTSO-E Status Report, ESR
 - ENTSO-E Acknowledgement process
- [2] ebIX® Business Requirement Specifications, see <http://www.ebix.org/>
- [3] The Harmonised Role Model, ENTSO-E, ebIX® and EFET, see <http://www.ebix.org/>
- [4] UN/CEFACT Unified Modelling Methodology (UMM), see <https://unece.org/trade/unecefact/umm>

BRS for Nordic Balance Settlement for data exchange between eSett and TSOs/Market Operators

- [5] Ediel Implementation guides, see <https://ediel.org/common-ediel-documents/>
- [6] Nordic Energy Market Domain Model, see <https://ediel.org/common-ediel-documents/>
- [7] BRS for Nordic Balancing System for the retail market (NBS BRS), see <https://ediel.org/nordic-balance-settlement-nbs/>
- [8] BRS for Nordic Balance Settlement, Exchange of Master Data, see <https://ediel.org/nordic-balance-settlement-nbs/>
- [9] BRS for Nordic trading system, will be published at <https://ediel.org/common-ediel-documents/>
- [10] BRS for Nordic Scheduling and Ancillary Services process, see <https://ediel.org/common-ediel-documents/>
- [11] Common Nordic XML rules and recommendations, see <https://ediel.org/common-ediel-documents/>
- [12] eSett Handbook, see <https://www.esett.com/handbook/>

1.6 Change log

Ver/rel/rev	Changed by	Date	Changes
3.2.A	Ove Nesvik	20240408	<ul style="list-style-type: none"> • Alignment of the first four chapters with the NBS BRS [7].
3.1.A	Ove Nesvik	20240408	<ul style="list-style-type: none"> • Changes to Ediel ERRP Reserve Allocation Result Document: <ul style="list-style-type: none"> ○ Replaced Reason codes Z77 and Z78 by Z54 and Z55 (AOF/non-AOF Reasons codes). ○ Opened for usage of Reason codes Z54 and Z55 both for aFRR (Process Type A30 (Tertiary reserve process)) and mFRR (A29 (Secondary reserve process)).
3.0.A	Ove Nesvik	20231208	<ul style="list-style-type: none"> • Addition of the Process type code “A59, Internal trade reporting” to ENTSO-E ESS Schedule Document. The code will be valid one year after eSett have announcement its removal, approximately until the end of 2024. In the transition period eSett will continue using Z05.
2.9.A	Ove Nesvik	20231023	<ul style="list-style-type: none"> • Addition of Reason codes for the 1st repetition of the Reason class in the Ediel ERRP Reserve Allocation Result Document: <ul style="list-style-type: none"> Z77 aFRR AOF activation Z78 aFRR non-AOF activation • Addition of a new Process type code for the Ediel ECAN Publication Document: <ul style="list-style-type: none"> A51 Automatic frequency restoration reserve
2.8.A	Ove Nesvik	20231005	<ul style="list-style-type: none"> • Addition of codes for Contract types: <ul style="list-style-type: none"> A14 First intraday auction contract A15 Second intraday auction contract A16 Third intraday auction contract • Rename of Balance Supplier to Energy Supplier • Correction of spelling errors.
2.7.A	Ove Nesvik	20230316	<ul style="list-style-type: none"> • Addition of new reason codes to the Ediel ERRP Reserve Allocation Result Document: <ul style="list-style-type: none"> Z58 Scheduled activation Z59 Direct activation

BRS for Nordic Balance Settlement for data exchange between eSett and TSOs/Market Operators

Ver/rel/rev	Changed by	Date	Changes	
			<p>Z60 Faster activation Z61 Faster deactivation Z62 Slower activation Z63 Period shift activation Z75 aFRR correction Z76 mFRR correction</p> <ul style="list-style-type: none"> • Rename Market Balance Area (MBA) to Bidding Zone (BZ) • Correction of spelling errors. 	
2.6.A	Ove Nesvik	20221114	<ul style="list-style-type: none"> • Addition of Process Type “A02 Intraday incremental” to ESS Schedule document, Day-ahead/Intraday trade and ESS Schedule document, Day-ahead/Intraday flow 	
2.5.A	Ove Nesvik	20210917	<ul style="list-style-type: none"> • Addition of down direction Ediel ERRP Reserve Allocation Result Document. • Rename of Reason Code: 	
			From:	To:
			Z42 Frequency Containment Reserve, Normal operation, day minus one (FCR-N, D-1)	Z42 Frequency Containment Reserve, Normal operation, day minus one (FCR-N, D-1 late)
			Z43 Frequency Containment Reserve, Normal operation, day minus two (FCR-N, D-2)	Z43 Frequency Containment Reserve, Normal operation, day minus one (FCR-N, D-1 early)
			Z44 Frequency Containment Reserve, Normal operation, day minus one, correction (FCR-N, D-1, correction)	Z44 Frequency Containment Reserve, Normal operation, day minus one, correction (FCR-N, D-1 , late correction)
			Z45 Frequency Containment Reserve, Normal operation, day minus two, correction (FCR-N, D-2, correction)	Z45 Frequency Containment Reserve, Normal operation, day minus one , correction (FCR-N, D-1 early correction)
			Z46 Frequency Containment Reserve, Disturbance, day minus one (FCR-D, D-1)	Z46 Frequency Containment Reserve, Disturbance, day minus one (FCR-D, D-1 late)
			Z47 Frequency Containment Reserve, Disturbance, day minus two (FCR-D, D-2)	Z47 Frequency Containment Reserve, Disturbance, day minus one (FCR-D, D-1 early)
			Z48 Frequency Containment Reserve, Disturbance, day minus one, correction (FCR-D, D-1, correction)	Z48 Frequency Containment Reserve, Disturbance, day minus one, correction (FCR-D, D-1 late correction)

BRS for Nordic Balance Settlement for data exchange between eSett and TSOs/Market Operators

Ver/rel/rev	Changed by	Date	Changes
			<p>Z49 Frequency Containment Reserve, Disturbance, day minus two, correction (FCR-D, D-2, correction)</p> <p>Z49 Frequency Containment Reserve, Disturbance, day minus one, correction (FCR-D, D-1 early correction)</p>
2.4.H	Ove Nesvik	20210702	<ul style="list-style-type: none"> • Addition of Business Types B67 and B68 to ENTSO-E ESS Schedule document, Day-ahead/Intraday flow document.
2.4.G	Ove Nesvik	20210512	<ul style="list-style-type: none"> • Addition of BSP (A46) as receiver and ISR (A05) as sender of “Ediel ERRP Reserve Allocation Result Document”. • Update of sequence diagram in chapter 2.3, i.e. addition of “Ediel ERRP Reserve Allocation Result Document” from ISR to BSP in new arrows 18 and 21. • Addition of definition of BSP in chapter 3.1. • Update of roles and domains in chapter 3 to the latest version of the Harmonised Role Model.
2.4.F	Ove Nesvik	20210415	<ul style="list-style-type: none"> • Addition of BSP for “Ediel ERRP Reserve Allocation Result Document” (Tendering Party) and the related dependency matrix (table 9).
2.4.E	Ove Nesvik	20210218	<ul style="list-style-type: none"> • Addition of new Direction code A03 for Process Type A28, Business type A11, Document Type A81 and Reason code Z49 in Ediel ERRP Reserve Allocation Result Document
2.4.D	Ove Nesvik	20210121	<ul style="list-style-type: none"> • Addition of new Process Type to ESS Schedule document (both “Day-ahead/Intraday trade” and “Day-ahead/Intraday flow”) and ECAN Publication Document: <ul style="list-style-type: none"> Z15 External trade (“Trade outside the Capacity Calculation Region” used for the North Sea Link cable). • Addition of new Business Type to ESS Schedule document (“Day-ahead/Intraday trade”) and ECAN Publication Document: <ul style="list-style-type: none"> A06 External trade without explicit capacity (used for the North Sea Link cable). • Addition of clarifying text.
2.4.C	Ove Nesvik	20210105	<ul style="list-style-type: none"> • Addition of new Reason Code Z56 in Ediel ERRP Reserve Allocation Result Document. • Textual clarifications in related dependency matrix.
2.4.B	Ove Nesvik	20191219	<ul style="list-style-type: none"> • Update of dependency matrix for Ediel ERRP Reserve Allocation Result Document: <ul style="list-style-type: none"> ○ Denmark will use Reason Codes Z30, Z31 and Z35.
2.4.A	Ove Nesvik	20191213	<ul style="list-style-type: none"> • Update of Ediel ERRP Reserve Allocation Result Document: <ul style="list-style-type: none"> ○ Addition of new Document Type Code A81 ○ Addition of new Measure Unit Quantity KWT (kW) and MAW (MW) ○ Addition of new Direction Code A03 ○ Addition of Reason codes Z42 to Z49 • Correction of spelling errors and textual clarifications
2.3.A	Ove Nesvik	20190128	<ul style="list-style-type: none"> • Addition of quarterly resolution for all time series documents (PT15M)

BRS for Nordic Balance Settlement for data exchange between eSett and TSOs/Market Operators

Ver/rel/rev	Changed by	Date	Changes
			<ul style="list-style-type: none"> ○ Addition of new Business Types (Z74 and Z75) in the Ediel ECAN Publication Document
2.2.A	Ove Nesvik	20190110	<ul style="list-style-type: none"> ● FCR-N and FCR-D are moved from Business Type codes to Reason codes in the Ediel ERRP Reserve Allocation Result Document.
2.1.B	Ove Nesvik	20181129	<ul style="list-style-type: none"> ● Clarification of national code usage in table 9.
2.1.A	Ove Nesvik	20181015	<ul style="list-style-type: none"> ● Addition of new Business Types in Ediel ERRP Reserve Allocation Result Document: <ul style="list-style-type: none"> ○ Z03 Frequency Containment Reserves, Normal (FCR-N) ○ Z06 Frequency Containment Reserves, Disturbance (FCR-D) ● A textbox “Added for the Nordic countries” has been removed from the class diagram for the Ediel ERRP Reserve Allocation Result Document. ● The Reason class is made required in the attribute table for the Ediel ERRP Reserve Allocation Result Document. ● NEG is renamed Ediel.
2.0.D	Ove Nesvik	20170704	<ul style="list-style-type: none"> ● Addition of business rules for NEG ERRP Reserve Allocation Result Document (paragraph 5.3.2) ● Replaced Elspot with Day-ahead ● Replaced Elbas with Intraday
2.0.C	Ove Nesvik	20170505	<ul style="list-style-type: none"> ● Removed Nord Pool logo on the front page ● Update of sequence diagram in Figure 4, including: <ul style="list-style-type: none"> ○ Removal of arrow 7, 8 and 9; Documented in BRS for Schedules ○ Removal of arrow 10 (not used) ○ Removal of arrow 4 and 5; documented in BRS for Trade ○ Removal of arrow 7, 8 and 9; documented in BRS for Schedules ● Update of Figure 11: <ul style="list-style-type: none"> ○ Removal of “Flow [In Sweden]” ● Update of Figure 13: <ul style="list-style-type: none"> ○ Removal of “Flow [Only in Sweden]” ● Addition of clarifying text related to Business Type B24 and B25; reporting of sales and purchases is seen from the Imbalance Settlement Responsible (not the BRP).
2.0.B	Ove Nesvik	20170213	<ul style="list-style-type: none"> ● Updated logos on the front page ● Replaced Nord Pool and NPS with Market Operator ● Replaced Elspot with Day-ahead ● Replaced Elbas with Intraday ● Updated NTC and NEG member list ● Renamed Svenska Kraftnät to Svenska kraftnät ● Removed arrow 6 and 7 in the sequence diagram for NBS Metering and settlement phase, and added a note to new arrow 7 and 8 “only used in Sweden” ● Corrected the usage of time zones for settlement structure in chapter 5.7.2.1
2.0.A	Ove Nesvik	20161121	The status of the document is changed from “For test implementation” to “For implementation”.

BRS for Nordic Balance Settlement for data exchange between eSett and TSOs/Market Operators

Ver/rel/rev	Changed by	Date	Changes
1.6.C	Ove Nesvik	20161014	Error correction: The sequence of the elements in the “Schedule Document” part of the paragraph “5.1.3 Attribute usage: ENTSO-E ESS Schedule document, Elspot/Elbas trade” is changed, so that “Domain” is before “Subject Party”.
1.6.B	Ove Nesvik	20160905	NEG ERRP Reserve Allocation Result Document: <ul style="list-style-type: none"> • Process Type is set to [1] • The related dependency matrix is extended with a Process Type
1.6.A	Ove Nesvik	20160531	<ul style="list-style-type: none"> • ENTSO-E ESS Schedule document, Elspot/Elbas trade: <ul style="list-style-type: none"> ○ Addition of clarifying text for Capacity Agreement Identification ○ Removal of “Portfolio ID” ○ Addition of Subject Party in the header level (currently not used) ○ Addition of Trader (optional) in the In Party. ○ Removal of Out Area (same as In area) ○ Removal of Out Party (Market Operator) ○ The term “Trader ID” is renamed to “Retailer ID” for InParty. • NEG ECAN Publication Document <ul style="list-style-type: none"> ○ Changed cardinality for Price to [0..1] ○ Removed Business Type “A87, Balancing energy price” • Chapter 5.1.4 “Attribute usage: ENTSO-E ESS Schedule document, Elspot/Elbas flow”: <ul style="list-style-type: none"> ○ Flows will be always reported with positive values • NEG ERRP Reserve Allocation Result Document: <ul style="list-style-type: none"> ○ Addition of clarifying text regarding usage of Settlement Amount ○ Tendering party for Reason Code Z38 is corrected to be BRP (only used in Finland) ○ Reserve Object is corrected to N/A for Reason Code Z22 ○ Addition of clarifying text regarding updates and usage of Settlement Amount ○ Correction of spelling errors • Addition of a new chapter 7 Technical Business Rules
1.5.C	Ove Nesvik	20151027	<ul style="list-style-type: none"> • Addition of clarifying text and error corrections
1.5.B	Ove Nesvik	20151002	<ul style="list-style-type: none"> • Correction of Reason codes in NEG ERRP Reserve Allocation Result Document • Correction of spelling errors, such as: <ul style="list-style-type: none"> ○ Correction to “2-13 calendar days” in Figure 5
1.5.A	Ove Nesvik	20150923	<ul style="list-style-type: none"> • Measure Unit Energy Price is removed from “NEG ERRP Reserve Allocation Result Document” • Removal of arrow 8 (Confirmation of BRPs and Traders trade in Elspot and Elbas) from figure 4 (Sequence diagram: The NBS scheduling phase) • Removal of NEG addition of Curve Type in Planned resource schedule document (no consequence for NBS messaging) • Addition of clarifying text and error corrections
1.4.B	Ove Nesvik	20150421	<ul style="list-style-type: none"> • Addition of clarifying text

BRS for Nordic Balance Settlement for data exchange between eSett and TSOs/Market Operators

Ver/rel/rev	Changed by	Date	Changes
1.4.A	Ove Nesvik	20150123	<ul style="list-style-type: none"> Update of description of content of areas, parties and quantity in ESS Schedule document for bilateral trade Update of references The term “master data” is used instead of “structure information” where applicable. NBS is renamed to Imbalance Settlement Responsible (ISR) or eSett, when used as a role.
1.3.B	Ove Nesvik	20141205	<ul style="list-style-type: none"> Update the harmonised roles in chapter 3, i.e. addition of Metering Point Administrator
1.3.A	Ove Nesvik	20141017	<ul style="list-style-type: none"> Document status is changed to “For test implementation” Alignment of chapter “2, Overview of the Nordic energy market domain” with NBS BRS NEG ERRP Reserve Allocation Result Document: <ul style="list-style-type: none"> Addition of reason codes: <ul style="list-style-type: none"> Z29 FCR Z30 aFRR Z31 mFRR, Balancing Power Z32 mFRR, Countertrades Z33 mFRR, Peak Load Reserve Regulation Z34 mFRR, Quarter regulation Z35 mFRR, Special Regulation Z36 Hour Change Regulation Z37 Power Transaction Z38 TSO Internal Countertrades Z39 Day Ahead Production Adjustment Reason (Reserve allocation result Time Series Level) is changed from optional [0..1] to Required [1] Addition of Portfolio ID in ENTSO-E ESS Schedule document, Elspot/Elbas trade Textual clarifications Updated Business Type codes: <ul style="list-style-type: none"> Z55 -> B20 Balance up regulation price Z56 -> B21 Balance down regulation price Z57 -> B22 Main direction Z58 -> B23 Consumption imbalance price Z59 -> B24 Production sales imbalance price Z60 -> B25 Production purchase imbalance price Z61 -> B26 Average balance price between MBAs (Renamed to “MBAs prices between Market Balance Areas”)
1.2.C	Ove Nesvik	20140422	<ul style="list-style-type: none"> Textual corrections (clarifications)
1.2.B	Ove Nesvik	20140418	<ul style="list-style-type: none"> Textual corrections (clarifications)
1.2.A	Ove Nesvik	20140411	<ul style="list-style-type: none"> Addition of new Business types in EPD document: <ul style="list-style-type: none"> Z55 Balance up regulation price Z56 Balance down regulation price Z57 Main direction Z58 Consumption imbalance price Z59 Production sales imbalance price Z60 Production purchase imbalance price Z61 Middle balance price between MBAs Addition of Direction in the Interval class in the EPD document

BRS for Nordic Balance Settlement for data exchange between eSett and TSOs/Market Operators

Ver/rel/rev	Changed by	Date	Changes
			<ul style="list-style-type: none"> • Correction of relations in “Figure 7: Outline of the Harmonised role model within the scope of NBS settlement system” • Addition of NBS acknowledgement principles • Restriction of <i>Resolution Duration</i> to always cover one hour • Addition of <i>Unit type</i> MWh • Restriction of <i>Energy Quantity</i> to max Watt resolution
1.1.D	Ove Nesvik	20140117	<ul style="list-style-type: none"> • Addition of clarifying text and error corrections
1.1.C	Ove Nesvik	20131201	<ul style="list-style-type: none"> • Time frame for exchange of data for imbalance settlement will be corrected to 2 - 13 days • Addition of a new arrow 23, Confirmation of production plans, in the sequence diagram for the Scheduling phase • Updated acknowledgement process in chapter 5 • Addition of clarifying text and corrections of spelling errors
1.1.B	Ove Nesvik	20131108	<ul style="list-style-type: none"> • Corrections of spelling errors
1.1.A	Ove Nesvik	20131108	<ul style="list-style-type: none"> • Update of links to other documents in the sequence diagrams. • Error corrections, such as: <ul style="list-style-type: none"> ○ Rename of ebIX[®], Confirmation of Aggregated Data per Neighbouring Grid for Settlement Responsible to NEG, Confirmation of Aggregated Data per Neighbouring Grid For Settlement Responsible ○ Rename of code E?? to Z08
1.0.A	Ove Nesvik	20130906	<ul style="list-style-type: none"> • First approved version for review and comments

2 Overview of the Nordic energy market domain

2.1 Settlement in the overall context (Domain model)

The *Domain model* describes the main business process areas needed to have a well-functioning energy market. The model is important for having a common and agreed understanding on how the energy market works as a basis for development of common methods for exchange of information.

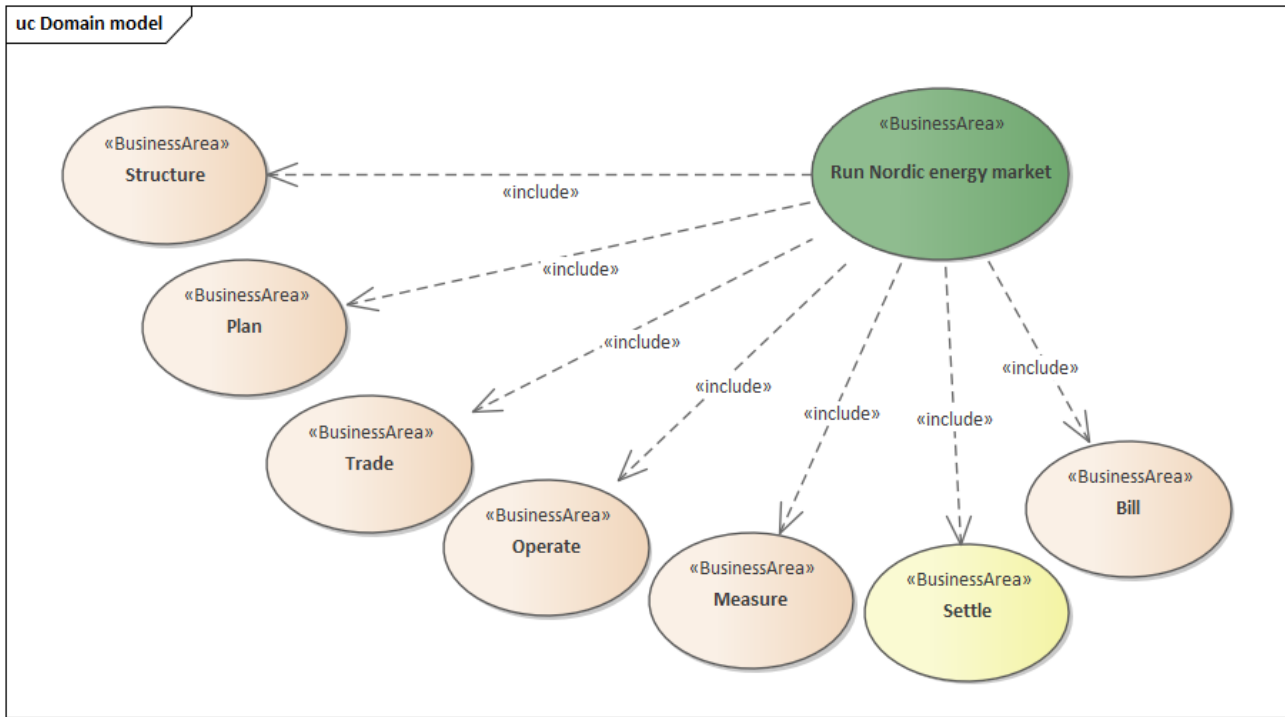


Figure 1: UseCase diagram: Ediel Energy Market Domain Model

The domain model of the energy market covers all stages from the structuring of the market until the settlement and billing of consumption and transport of energy, with a focus on the exchange of information:

- Exchange of master data including the Change of Supplier processes
- Planning of production, consumption, exchange and transport
- Trade on different markets, including ancillary services, bilateral trade, etc.
- Operation
- Measuring of production, consumption, exchange and transport
- Settlement
- Billing

The Nordic Settlement System process includes parts of the process areas Trade and Plan.

For a more elaborated description of the processes included in the domain model, see [6].

2.2 Breakdown of the settlement phase

For a detailed overview of sub UseCases within the UseCase Settle, see BRS for Nordic Balancing System for the retail market (NBS BRS) [7].

2.3 Overview of information exchange for the NBS scheduling phase

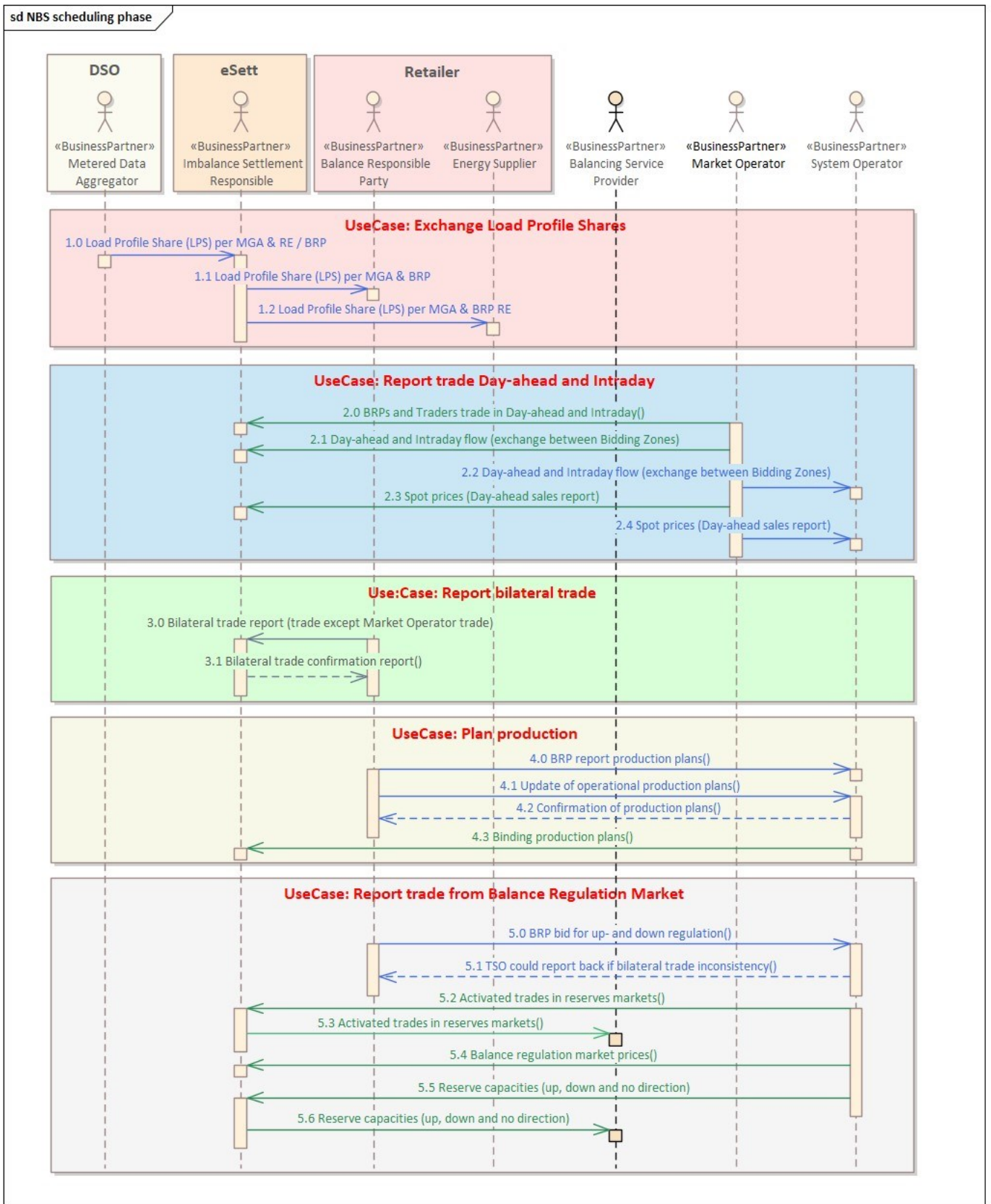


Figure 2: Sequence diagram: The NBS scheduling phase

Comments to the diagram:

- Only documents exchanged between eSett, and TSOs and Market Operators, i.e., only documents (arrows) with green colour, is further elaborated in this document.
- Documents (arrows) with black colour are documented in the NBS BRS [7], while documents (arrows) with blue colour are or will be documented in other BRSs from NEG, i.e. [9] and [10].

NBS document	Roles	Identified object(s)	Documentation
Before the delivery month			
1.0 Load Profile Share (LPS) per MGA & RE / BRP			Not handled in the first version of the BRS.
1.1 Load Profile Share (LPS) per MGA & BRP			Only published on web
1.2 Load Profile Share (LPS) per MGA & BRP RE			Only published on web
Before gate closure			
2.0 BRPs and Traders trade in Day-ahead and Intraday	MO → ISR	BZ, BRP or Trader (RE)	ENTSO-E ESS Schedule Document [1] For details see: 5.1
2.1 Day-ahead and Intraday flow (exchange between Bidding Zones)	MO → ISR	BZ 1, BZ 2	ENTSO-E ESS Schedule Document [1] For details see: 5.1
2.2 Day-ahead and Intraday flow (exchange between Bidding Zones)			ENTSO-E ESS Schedule Document [1] For details see: BRS for Nordic Scheduling Process [10]
2.3 Spot prices (Day-ahead sales report)	MO → ISR	BZ	ENTSO-E ECAN Publication Document [1] For details see: 5.4
2.4 Spot prices (Day-ahead sales report)			ENTSO-E ECAN Publication Document [1] For details see: BRS for Nordic Trading System [9]
3.0 Bilateral trade report (trade except Market Operator trade)	BRP → ISR	BZ, Trader 1, Trader 2	ENTSO-E ESS Schedule Document [1] For details see: BRS for Nordic Balance Settlement [7]
3.1 Bilateral trade confirmation report	ISR → BRP	BZ, Trader 1, Trader 2	ENTSO-E ESS Schedule Document [1] For details see: BRS for Nordic Balance Settlement [7]
4.0 BRP report production plans			ENTSO-E ERRP Planned Resource schedule [1] For details see: BRS for Nordic Scheduling Process [10]
4.1 Update of operational production plans			ENTSO-E ERRP Planned Resource schedule [1] For details see: BRS for Nordic Scheduling Process [10]
4.2 Confirmation of production plans			ENTSO-E ERRP Resource schedule confirmation report [1] For details see: BRS for Nordic Scheduling Process [10]
4.3 Binding production plans	SO → ISR	BZ, R, BRP, RE	ENTSO-E ERRP Planned resource schedule [1] For details see: 5.2

BRS for Nordic Balance Settlement for data exchange between eSett and TSOs/Market Operators

NBS document	Roles	Identified object(s)	Documentation
5.0 BRP bid for up- and down regulation			ENTSO-E ERRP Reserve Bid Document for Reserve Tenders [1] For details see: BRS for Nordic Trading System [9]
5.1 TSO could report back if bilateral trade inconsistency			ENTSO-E ESS Confirmation Report [1] For details see: BRS for Nordic Scheduling Process [10]
Short time after gate closure			
5.2 Activated trades in reserves markets A) Reserves Up B) Reserves Down C) Supportive power Sold D) Supportive power Bought	SO → ISR	A) and B): BZ, BRP, R C) and D): BZ 1, BZ 2, TSO	Ediel ERRP Reserve Allocation Result Document [1] For details see: 5.3
5.3 Activated trades in reserves markets A) Reserves Up B) Reserves Down C) Supportive power Sold D) Supportive power Bought	ISR → BSP	A) and B): BZ, BRP, R C) and D): BZ 1, BZ 2, TSO	Ediel ERRP Reserve Allocation Result Document [1] For details see: 5.3
5.4 Balance regulation market prices	SO → ISR	BZ	ENTSO-E ECAN Publication Document [1] For details see: 5.4
5.5 Reserve capacities (up, down and no direction)	SO → ISR	BZ	Ediel ERRP Reserve Allocation Result Document [1] For details see: 5.3
5.6 Reserve capacities (up, down and no direction)	ISR → BSP	BZ	Ediel ERRP Reserve Allocation Result Document [1] For details see: 5.3

Table 1: NBS scheduling phase documents

2.4 Overview of information exchange for the NBS metering, settlement and reconciliation phase

For a detailed overview of information exchange for the NBS metering, settlement and reconciliation phase, see BRS for Nordic Balancing System for the retail market (NBS BRS) [7].

3 Harmonised roles used in Nordic settlement system

For a detailed overview of the relevant roles from the ebIX®, EFET and ENTSO-E Harmonised Electricity Market Role Model (HEMRM), see BRS for Nordic Balancing System for the retail market (NBS BRS) [7].

4 Process areas within Nordic settlement system

4.1 Process area: Receive and validate Master Data

See separate BRS [8].

4.2 Process area: Master Data

See separate BRS [8].

4.3 Process area: Exchange Load Profile Shares

For a detailed overview of the Process area: Exchange Load Profile Shares, see BRS for Nordic Balancing System for the retail market (NBS BRS) [7].

4.4 Process area: Report trade from Day-ahead and Intraday

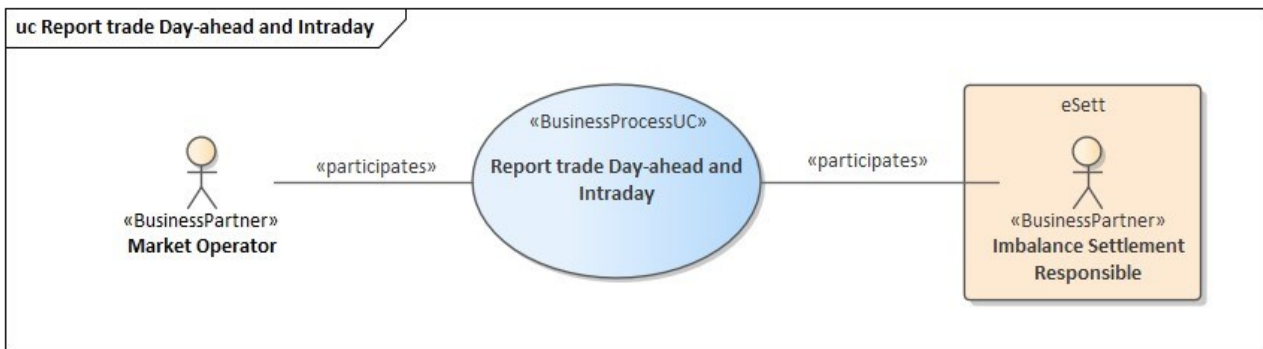


Figure 3: UseCase: Report trade from Day-ahead and Intraday

On the *Day-ahead market*, power contracts are traded daily for physical delivery in the next day's 24-hour period. The price calculation is based on the balance between bids and offers from all market participants – finding the intersection point between the market's supply curve and demand curve. This trading method is referred to as equilibrium point trading, auction trading, or simultaneous price setting. The price mechanism in *Day-ahead market* adjusts the flow of power across the interconnectors, and on certain connections within the Norwegian and Swedish grids, to the available trading capacity given by the Nordic Transmission System Operators. Thus, *Day-ahead market* is a common power market for the Nordic countries, with an implicit capacity auction on the interconnectors between the *Bidding Zones*.

All participants who meet the requirements set by the Market Operator are given access to the *Day-ahead market*. However, *Day-ahead market* participants must have a balancing agreement with the respective Transmission System Operator or through a third party.

The intraday market is a tool for Trade Responsible Parties to adjust their balance during intraday. The parties on the intraday market are Producers, Consumers and Traders.

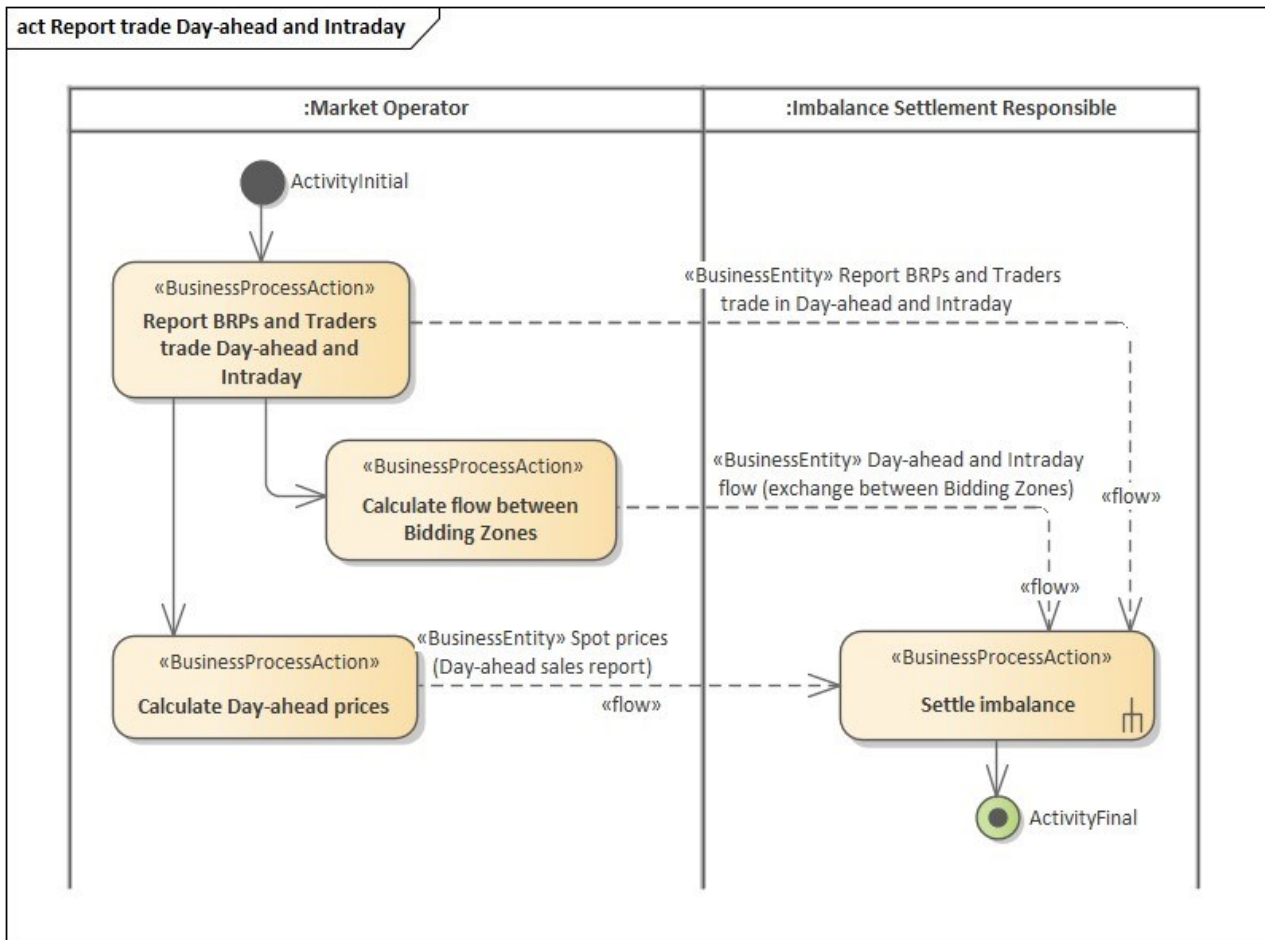


Figure 4: Activity diagram: Report trade from Day-ahead and Intraday

Comment to the diagram:

- Only actions and documents related to eSett is shown.

4.5 Process area: Report bilateral trade

For a detailed overview of the Process area: Report bilateral trade, see BRS for Nordic Balancing System for the retail market (NBS BRS) [7].

4.6 Process area: Plan production

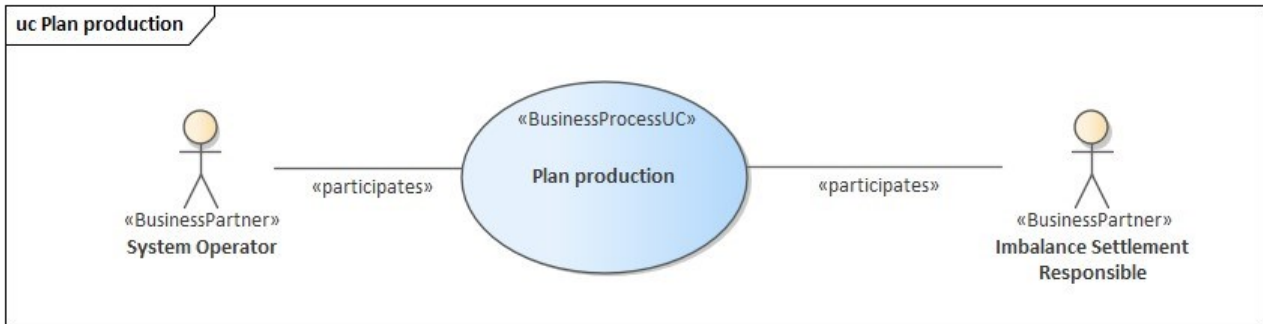


Figure 5: UseCase: Plan production

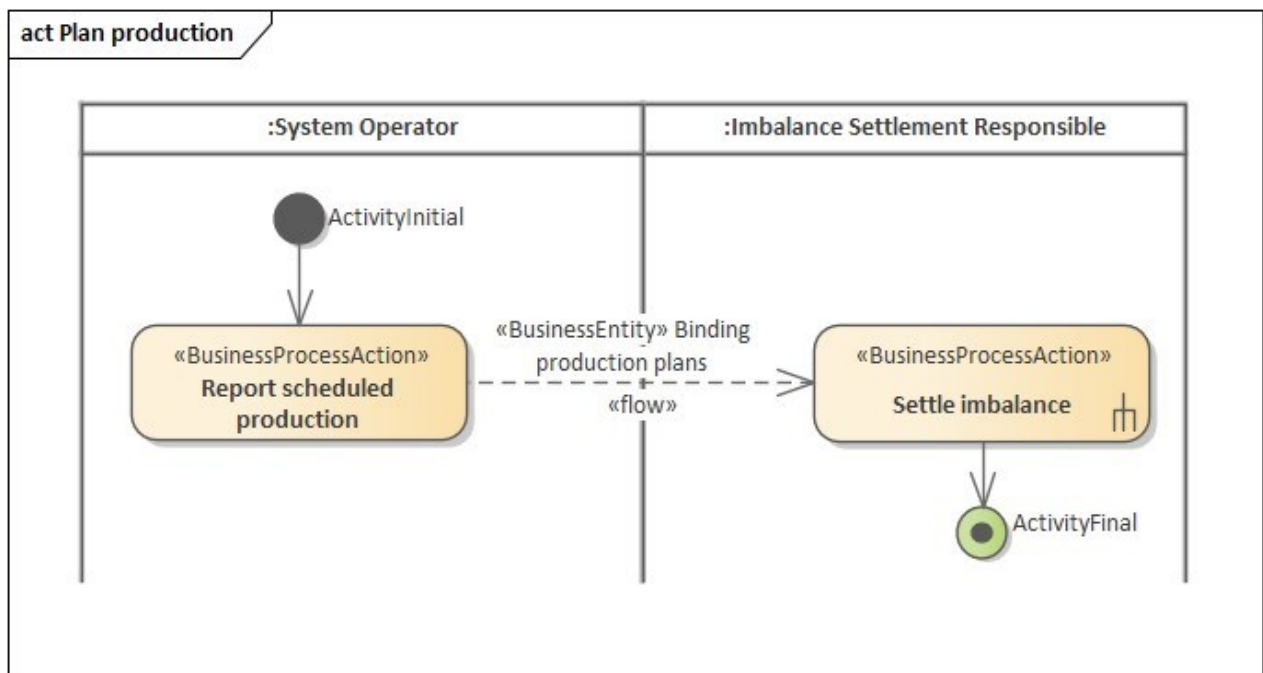


Figure 6: Activity diagram: Plan production

4.7 Process area: Report trade from Balance Regulation Market

The trade on the balance regulation market is documented in [7], BRS for the Nordic trading system. The Activated Trade in Reserves Market is reported from the *System Operator* to the *Imbalance Settlement Responsible* as the interface between the *Nordic trading system* and the *Nordic Balancing System*.

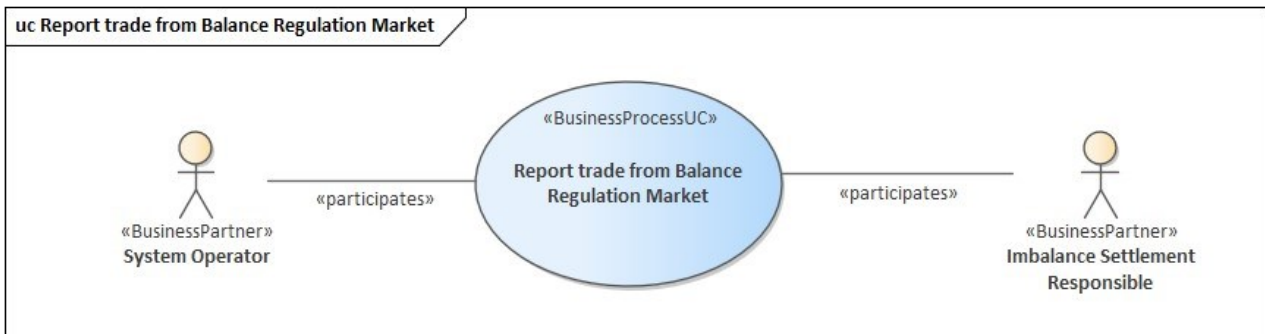


Figure 7: UseCase: Report trade from Balance Regulation Market

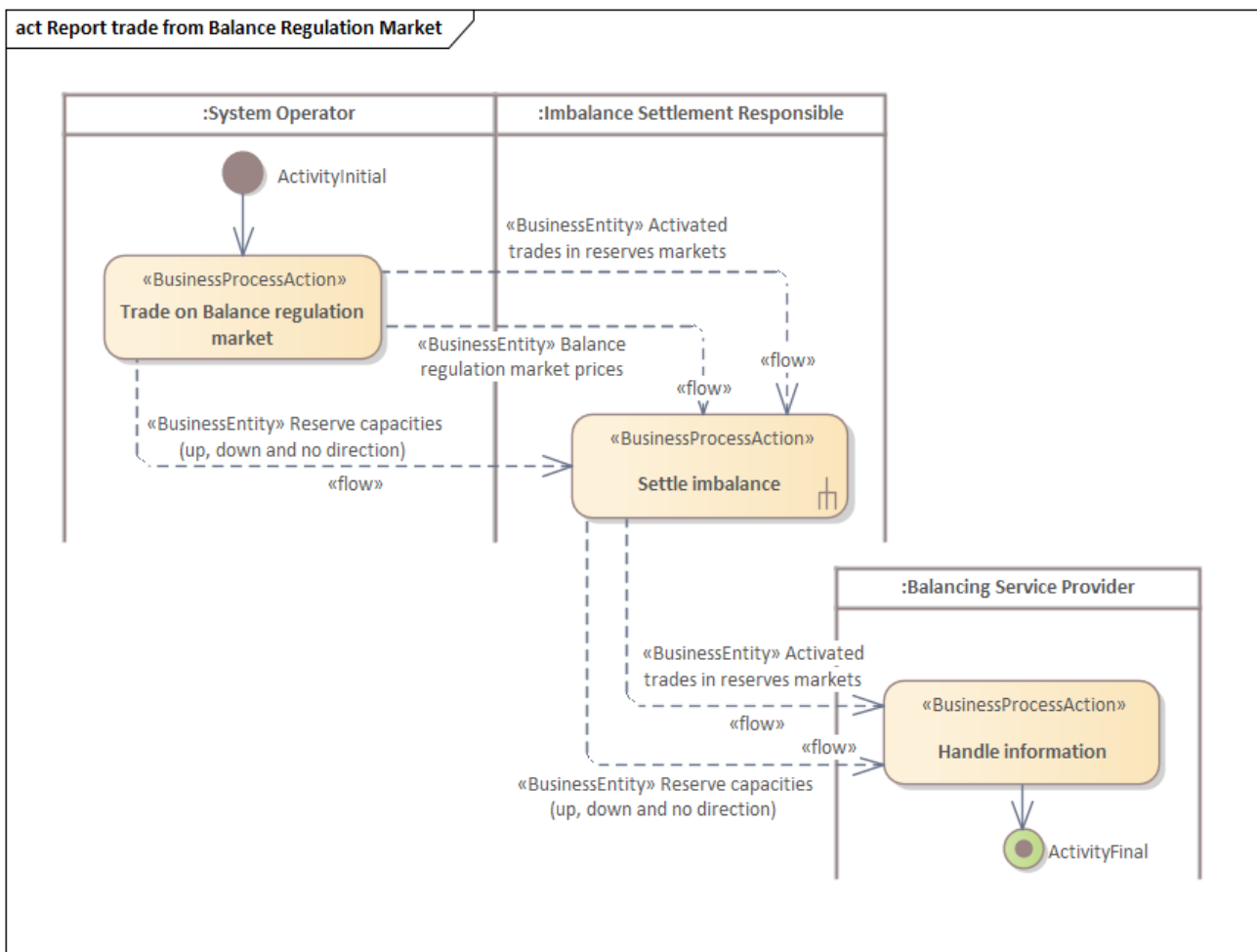


Figure 8: Activity diagram: Report trade from Balance Regulation Market

4.8 Process area: Exchange metered data for imbalance settlement

For a detailed overview of the Process area: Exchange metered data for imbalance settlement, see BRS for Nordic Balancing System for the retail market (NBS BRS) [7].

4.9 Process area: Report balancing services

For a detailed overview of the Process area: Report balancing services, see BRS for Nordic Balancing System for the retail market (NBS BRS) [7].

4.10 Process area: Distribute settlement basis data

Not handled in the first version of a common Nordic Balance Settlement.

4.11 Process area: Settle imbalance

For a detailed overview of the Process area: Settle imbalance, see BRS for Nordic Balancing System for the retail market (NBS BRS) [7].

4.12 Process area: Reconcile

Not handled in the first version of a common Nordic Balance Settlement.

5 Business Data View

This chapter describes class diagrams, showing the content of the business documents defined in the previous defined UML diagrams. The class diagram shows the important information needed to identify the document header, time series and observations to be exchanged, such as:

- The reported object, such as Metering point, Resource object (Station group or Regulation object), In area and Out area
- The level of aggregation, such as per Energy Supplier and Balance responsible party
- The characteristics needed to express the nature of the time series, such as *Business type* and *Product*.

Technical elements related to the communication channel (SMTP, WS...) and syntax (EDIFACT, XML...) are skipped.

5.1 ENTSO-E ESS Schedule document

The *ENTSO-E ESS Schedule document* is documented in the *ENTSO-E Scheduling System (ESS) Implementation Guide*, see [1].

5.1.1 Class diagram: ENTSO-E ESS Schedule document

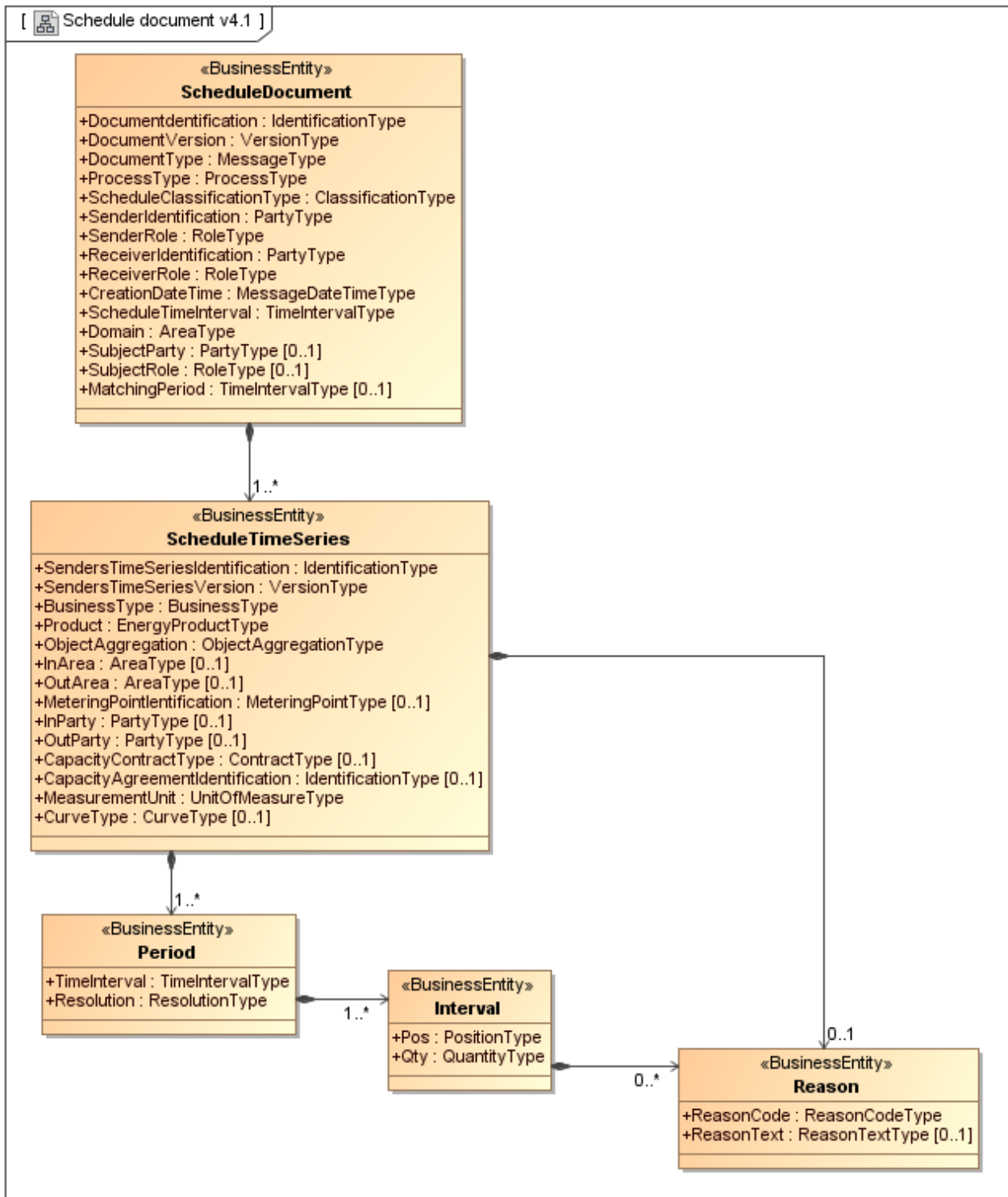


Figure 9: Class diagram: ENTSO-E ESS Schedule document

The document is used in the following exchanges:

- Overview of information exchange for the NBS scheduling phase **Error! Reference source not found.**
 - 2.0, BRPs and Traders trade in Day-ahead and Intraday **Error! Reference source not found.**
 - 2.1, Day-ahead and Intraday flow (exchange between Bidding Zones) **Error! Reference source not found.**

5.1.2 Attribute usage: ENTSO-E ESS Schedule document, Bilateral trade

ESS Attribute	Cl.	Content	Descriptions and comments
Schedule Document	[1]		
Document Identification	[1]	Document ID	Unique identification of the document
Document Version	[1]	Version	Fixed 1
Document Type	[1]	A01	A01 Balance responsible schedule
Process Type	[1]	A59 or Z05	A59 Internal trade reporting Z05 Bilateral trade ¹
Schedule Classification Type	[1]	A02	A02 Summary type
Sender Identification	[1]	SO or BRP ID	Unique identification of the sender
Sender role	[1]	A04 or A08	A04 System Operator A08 Balance Responsible Party
Receiver Identification	[1]	ISR ID	Unique identification of the Receiver
Receiver role	[1]	A05	A05 Imbalance Settlement Responsible
Creation Date Time	[1]	Creation date/time	The date and time that the message was prepared for transmission by the application of the sender.
Schedule Time Interval	[1]	Start and end date of the time series	The beginning and ending date and time of the period covered by the message containing the schedule.
Domain	[1]	Nordic Market Area ID	Identification of the area covered by the document, i.e. 10Y1001A1001A91G (Nordic market area)
Schedule Time Series	[1..*]		
Senders Time Series Identification	[1]	Time series ID	Unique identification of the Time Series (unique over time for the sender in question)
Senders Time Series Version	[1]	Version	Fixed 1
Business Type	[1]	A08	A08 Net internal trade (Within a Bidding Zone) (Net internal trade - where the direction from out party (seller) to in party (buyer) is positive and the opposite direction is negative (with minus signs)).
Product	[1]	8716867000030	8716867000030 Active energy

¹ The code “Z05 Bilateral trade” will be valid one year after eSett have announcement its removal, approximately until the end of 2024. In the transition period eSett will continue using Z05.

BRS for Nordic Balance Settlement for data exchange between eSett and TSOs/Market Operators

ESS Attribute	Cl.	Content	Descriptions and comments
Object Aggregation	[1]	A01	A01 Area
In Area	[1]	BZ ID	The Bidding Zone where the trade has taken place.
Out Area	[1]	BZ ID	The same Bidding Zone as defined in In Area, i.e. where the trade has taken place.
In Party	[1]	BRP 1 ID	The Balance Responsible Party acting as the buyer in the bilateral trade.
Out Party	[1]	BRP 2 ID	The Balance Responsible Party acting as the seller in the bilateral trade.
Capacity Agreement Identification	[0..1]	Bilateral Trade ID	An ID only used when reporting trade on a Energy Supplier (Retailer) level, identifying the two involved Energy Suppliers and the related Bidding Zone. The Bilateral Trade ID will be unique in combination with In Party, Out Party and BZ. Note: Currently not used
Measurement Unit	[1]	KWH or MWH	KWH kWh MWH MWh
Period	[1..*]		
Time Interval	[1]	Start and end date time	The start and end date and time of the time interval of the period in question.
Resolution	[1]	Resolution	The resolution is expressed in compliance with ISO 8601 in the following format: PnYnMnDTnHnMnS. Where nY expresses a number of years, nM a number of months, nD a number of days. The letter "T" separates the date expression from the time expression and after it nH identifies a number of hours, nM a number of minutes and nS a number of seconds. In NBS hourly or quarterly resolution is used, i.e., PT1H , PT60M or PT15M .
Interval	[1..*]		
Pos	[1]	Position	Position
Qty	[1]	Quantity	Quantity The direction from out party (seller) to in party (buyer) is positive, while the opposite direction is negative (with minus signs)) The resolution is maximum in Watt, i.e. max 3 decimals for kWh and max 6 decimals for MWh

Table 2: Attribute usage: ENTSO-E ESS Schedule document, Bilateral trade

BRS for Nordic Balance Settlement for data exchange between eSett and TSOs/Market Operators

5.1.3 Attribute usage: ENTSO-E ESS Schedule document, Day-ahead/Intraday trade

ESS Attribute	Cl.	Content	Descriptions and comments
Schedule Document	[1]		
Document Identification	[1]	Document ID	Unique identification of the document
Document Version	[1]	Version	Fixed 1
Document Type	[1]	A01	A01 Balance responsible schedule
Process Type	[1]	A01 A02 A19 Z15	A01 Day-ahead A02 Intraday incremental A19 Intraday accumulated Z15 External trade (Trade outside the Capacity Calculation Region)
Schedule Classification Type	[1]	A02	A02 Summary type
Sender Identification	[1]	MO or SO ID	Unique identification of the sender
Sender Role	[1]	A04 A11	A04 System Operator A11 Market Operator
Receiver Identification	[1]	ISR ID	Unique identification of the Receiver
Receiver Role	[1]	A05	A05 Imbalance Settlement Responsible
Creation Date Time	[1]	Creation date/time	The date and time that the message was prepared for transmission by the application of the sender.
Schedule Time Interval	[1]	Start and end date of the time series	The beginning and ending date and time of the period covered by the message containing the schedule.
Domain	[1]	Nordic Market Area ID	Identification of the area covered by the document, i.e., 10Y1001A1001A91G (Nordic market area)
Subject Party	[1]	BRP ID	Unique identification of the BRP in question
Subject Role	[1]	A08	A08 Balance Responsible Party
Schedule Time Series	[1..*]		
Senders Time Series Identification	[1]	Time series ID	Unique identification of the Time Series (unique over time for the sender in question)
Senders Time Series Version	[1]	Version	Fixed 1
Business Type	[1]	A06 or A08	A06 External trade without explicit capacity (used for the North Sea Link cable). A08 Net internal trade (Within a Bidding Zone) (Net internal trade - where the direction from out party (seller) to in party (buyer) is positive and the opposite direction is negative (with minus signs). Business Type A06 is used together with Process Type Z15 . Business Type A08 is used together with Process Type A01 , A02 and A19 .
Product	[1]	8716867000030	8716867000030 Active energy

BRS for Nordic Balance Settlement for data exchange between eSett and TSOs/Market Operators

ESS Attribute	Cl.	Content	Descriptions and comments
Object Aggregation	[1]	A01	A01 Area
In Area	[1]	BZBZ ID	Bidding Zone
In Party	[0..1]	Retailer ID	The unique identification of the Retailer (Company) in question
Measurement Unit	[1]	KWH or MWH	KWH kWh MWH MWh
Period	[1..*]		
Time Interval	[1]	Start and end date time	The start and end date and time of the time interval of the period in question.
Resolution	[1]	Resolution	The resolution is expressed in compliance with ISO 8601 in the following format: PnYnMnDTnHnMnS. Where nY expresses a number of years, nM a number of months, nD a number of days. The letter "T" separates the date expression from the time expression and after it nH identifies a number of hours, nM a number of minutes and nS a number of seconds. In NBS hourly or quarterly resolution is used, i.e., PT1H , PT60M or PT15M .
Interval	[1..*]		
Pos	[1]	Position	Position
Qty	[1]	Quantity	Quantity The resolution is maximum in Watt, i.e., max 3 decimals for kWh and max 6 decimals for MWh The direction from out party (seller) to in party (buyer) is positive, while the opposite direction is negative (with minus signs))

Table 3: Attribute usage: ENTSO-E ESS Schedule document, Day-ahead and Intraday trade

5.1.4 Attribute usage: ENTSO-E ESS Schedule document, Day-ahead/Intraday flow

ESS Attribute	Cl.	Content	Descriptions and comments
Schedule Document	[1]		
Document Identification	[1]	Document ID	Unique identification of the document
Document Version	[1]	Version	Fixed 1
Document Type	[1]	A55	A55 Summarised Market Schedule (A compilation of all external schedules concerning two Bidding Zones of all balance responsible parties)
Process Type	[1]	A01 A02 A19 Z15	A01 Day-ahead A02 Intraday incremental A19 Intraday accumulated Z15 External trade (Trade outside the Capacity Calculation Region)
Schedule Classification Type	[1]	A02	A02 Summary type
Sender Identification	[1]	MO ID	Unique identification of the Market operator (sender)
Sender role	[1]	A11	A11 Market Operator
Receiver Identification	[1]	ISR ID	Unique identification of the Imbalance Settlement Responsible (receiver)
Receiver role	[1]	A05	A05 Imbalance Settlement Responsible
Creation Date Time	[1]	Creation date/time	The date and time that the message was prepared for transmission by the application of the sender.
Schedule Time Interval	[1]	Start and end date of the time series	The beginning and ending date and time of the period covered by the message containing the schedule.
Domain	[1]	Nordic Market Area ID	Identification of the area covered by the document, i.e., 10Y1001A1001A91G (Nordic market area)
Schedule Time Series	[1..*]		
Senders Time Series Identification	[1]	Time series ID	Unique identification of the Time Series (unique over time for the sender in question)
Senders Time Series Version	[1]	Version	Fixed 1
Business Type	[1]	A66	A66 Energy flow B67 DC flow with losses - DC flow with losses refers to the values at the importing end of the DC line B68 DC flow without losses - DC flow without losses refers to the values at the exporting end of the DC line.
Product	[1]	8716867000030	8716867000030 Active energy
Object Aggregation	[1]	A01	A01 Area
In Area	[1]	BZ 1 ID	One Bidding Zone
Out Area	[1]	BZ 2 ID	The other Bidding Zone

BRS for Nordic Balance Settlement for data exchange between eSett and TSOs/Market Operators

ESS Attribute	Cl.	Content	Descriptions and comments
Measurement Unit	[1]	KWH or MWH	KWH kWh MWH MWh
Period	[1..*]		
Time Interval	[1]	Start and end date time	The start and end date and time of the time interval of the period in question.
Resolution	[1]	Resolution	The resolution is expressed in compliance with ISO 8601 in the following format: PnYnMnDTnHnMnS. Where nY expresses a number of years, nM a number of months, nD a number of days. The letter "T" separates the date expression from the time expression and after it nH identifies a number of hours, nM a number of minutes and nS a number of seconds. In NBS hourly or quarterly resolution is used, i.e., PT1H , PT60M or PT15M .
Interval	[1..*]		
Pos	[1]	Position	Position
Qty	[1]	Quantity	Quantity Flows will always be reported with positive values. For each connection, flows will be reported as two time series, one for each direction. Positive values for flow from Out Area to In Area and zero in the corresponding position in the other time series. The resolution is maximum in Watt, i.e., max 3 decimals for kWh and max 6 decimals for MWh

Table 4: Attribute usage: ENTSO-E ESS Schedule document, Day-ahead/intraday flow

5.2 ENTSO-E ERRP Planned resource schedule

The *ENTSO-E ERRP Planned resource schedule* is documented in the *ENTSO-E Reserve Resource Process (ERRP) Implementation Guide*, see [1].

5.2.1 Class diagram: ENTSO-E ERRP Planned resource schedule

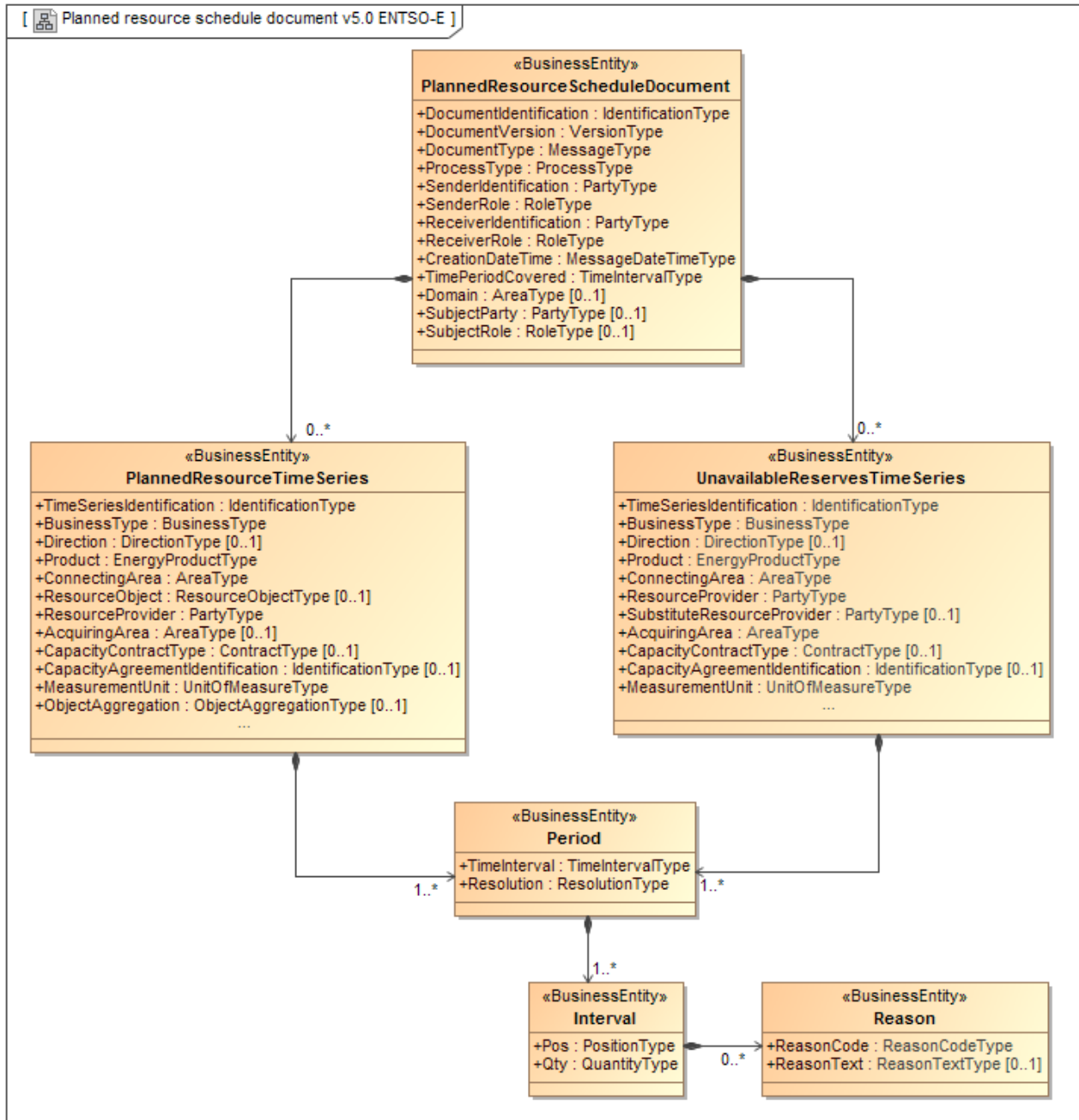


Figure 10: Class diagram: ENTSO-E ERRP Planned resource schedule

The document is used in the following exchanges:

- Overview of information exchange for the NBS scheduling phase **Error! Reference source not found.**
 - 4.3, Binding production plans **Error! Reference source not found.**

5.2.2 [Attribute usage: ENTSO-E ERRP Planned resource schedule](#)

ERRP Planned Resource Schedule Attribute	Cl.	Content	Descriptions and comments
Planned Resource Schedule Document	[1]		
Document Identification	[1]	Document ID	Unique identification of the document
Document Version	[1]	"1"	Fixed 1
Document Type	[1]	A14	A14 Resource Provider Resource Schedule
Process Type	[1]	A17	A17 Schedule day - The process concerns the day ahead, intraday and eventually ex-post scheduling in a single document. The schedule will be transferred within the total position including historic information (The trade balance of a party at a given time)
Sender Identification	[1]	SO ID	Unique identification of the System Operator, sending the schedule
Sender role	[1]	A04	A04 System Operator
Receiver Identification	[1]	ISR ID	Unique identification of the Imbalance Settlement Responsible, receiving the schedule
Receiver role	[1]	A05	A05 Imbalance Settlement Responsible
Creation Date Time	[1]	Creation date/time	The date and time that the document was prepared for transmission by the application of the sender.
Time Period Covered	[1]	Start and end date of the time series	The beginning and ending date and time of the period covered by the document.
Domain	[1]	Nordic Market Area ID	Identification of the area covered by the document, i.e., 10Y1001A1001A91G (Nordic market area)
Subject Party	[0..1]	RE ID	The Retailer (RE) is only used in Finland
Subject Role	[0..1]	A12	A12 Energy Supplier (Retailer), only used in Finland
Planned Resource Schedule Time Series	[1..*]		
Time Series Identification	[1]	Time series ID	Unique identification of the Time Series (unique over time for the sender in question)
Business Type	[1]	Business Type	A01 Production A04 Consumption (general consumption) Z52 Small scale production
Product	[1]	8716867000030	8716867000030 Active energy
Connecting Area	[1]	BZ ID	Unique identification of the Bidding Zone
Resource Object	[1]	RO ID	The Resource Object of the production plans

BRS for Nordic Balance Settlement for data exchange between eSett and TSOs/Market Operators

ERRP Planned Resource Schedule Attribute	Cl.	Content	Descriptions and comments
Resource Provider	[1]	BRP ID	The Resource Provider (BRP) of the production plans
Measurement Unit	[1]	KWH or MWH	KWH kWh MWH MWh
Object Aggregation	[1]	A06	A06 Resource Object
Period	[1..*]		
Time Interval	[1]	Start and end date time	The start and end date and time of the time interval of the period in question.
Resolution	[1]	Resolution	<p>The resolution is expressed in compliance with ISO 8601 in the following format:</p> <p style="text-align: center;">PnYnMnDTnHnMnS.</p> <p>Where nY expresses a number of years, nM a number of months, nD a number of days.</p> <p>The letter "T" separates the date expression from the time expression and after it nH identifies a number of hours, nM a number of minutes and nS a number of seconds.</p> <p>In NBS hourly or quarterly resolution is used, i.e., PT1H, PT60M or PT15M.</p>
Interval	[1..*]		
Pos	[1]	Position	Position
Qty	[1]	Quantity	<p>Quantity</p> <p>The resolution is maximum in Watt, i.e., max 3 decimals for kWh and max 6 decimals for MWh</p>

Table 5: Attribute usage: ENTSO-E ERRP Planned resource schedule

5.3 Ediel ERRP Reserve Allocation Result Document

The *ENTSO-E ERRP Reserve Allocation Result Document* is documented in the *ENTSO-E Reserve Resource Process (ERRP) Implementation Guide*, see [1].

5.3.1 Class diagram: Ediel ERRP Reserve Allocation Result Document

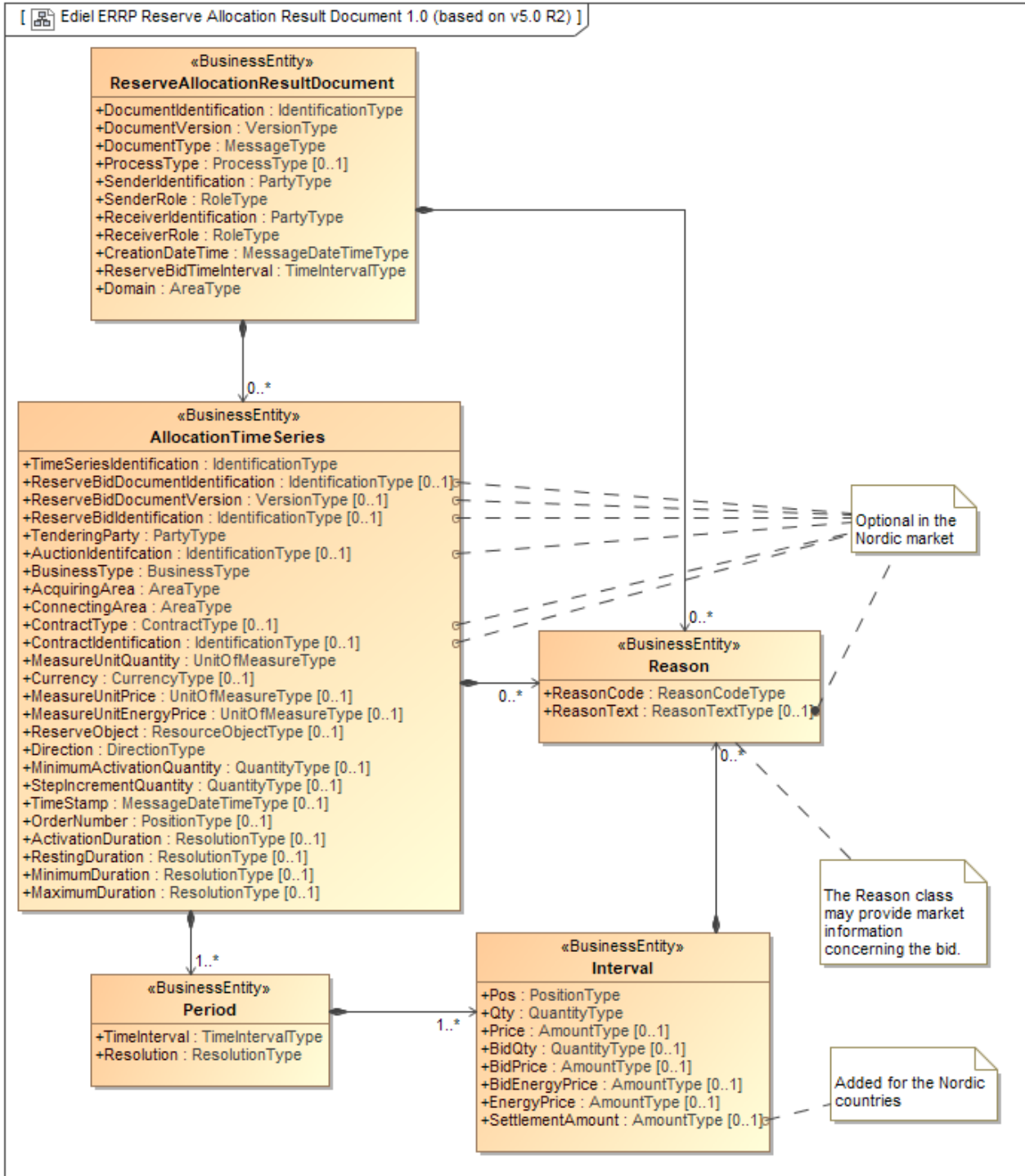


Figure 11: Class diagram: Ediel ERRP Reserve Allocation Result Document

The document is used in the following exchanges:

- Overview of information exchange for the NBS scheduling phase **Error! Reference source not found.:**
 - 5.2, Activated trades in reserves markets **Error! Reference source not found.:**
 - Reserves Up
 - Reserves Down
 - Supportive power Sold
 - Supportive power Bought
 - 5.3, Activated trades in reserves markets **Error! Reference source not found.:**
 - Capacities up
 - Capacities down
 - Capacity, no direction
 - 5.5, Reserve capacities (up, down and no direction)
 - 5.6, Reserve capacities (up, down and no direction)

5.3.2 Business rules:

- All valid regulations for a period and Process Type (primary, secondary or tertiary regulations) must be sent in one document.
- If updates are sent, all valid regulations for the relevant period must be sent in the update-document (i.e. all still valid time series from the predecessor). An update-document shall always cover the same period as its predecessor. The latest received message will always replace the previous one.
- All regulations not part of the latest update-document shall be deleted.

5.3.3 Attribute usage: Ediel ERRP Reserve Allocation Result Document

Ediel ERRP Reserve Allocation Result Document Attribute	Cl.	Content	Descriptions and comments
Reserve Allocation Result Document	[1]		
Document Identification	[1]	Document ID	Unique identification of the document
Document Version	[1]	"1"	Fixed 1
Document Type	[1]	A38 or A81	A38 Reserve Allocation Result A81 Contracted reserves
Process Type	[1]	Process Type	A28 Primary reserve process A29 Secondary reserve process A30 Tertiary reserve process
Sender Identification	[1]	SO ID	Unique identification of the System Operator, sending the document
Sender role	[1]	A04	A04 System Operator A05 Imbalance Settlement Responsible
Receiver Identification	[1]	ISR ID	Unique identification of the Imbalance Settlement Responsible, receiving the schedule
Receiver role	[1]	A05 or A46	A05 Imbalance Settlement Responsible A46 Balancing Service Provider (BSP)

BRS for Nordic Balance Settlement for data exchange between eSett and TSOs/Market Operators

Ediel ERRP Reserve Allocation Result Document Attribute	Cl.	Content	Descriptions and comments
Creation Date Time	[1]	Creation date/time	The date and time that the document was prepared for transmission by the application of the sender.
Reserve Bid Time Interval	[1]	Start and end date of the time series	The beginning and ending date and time of the period covered by the document.
Domain	[1]	Nordic Market Area ID	Identification of the area covered by the document, i.e. 10Y1001A1001A91G (Nordic market area)
Allocation Time Series	[0..*]		
Time Series Identification	[1]	Time series ID	Unique identification of the Time Series (unique over time for the sender in question)
Tendering Party	[1]	BRP, BSP or TSO ID	See dependency matrix below
Business Type	[1]	Business Type	A10 Tertiary control A11 Primary control A12 Secondary control
Acquiring Area	[1]	BZ ID	Unique identification of the Bidding Zone (BZ) where the energy is purchased. This will be the same BZ as the Connecting Area, except for supportive power (incl. transit) where the resource is connected in another BZ.
Connecting Area	[1]	BZ ID	Unique identification of the Bidding Zone (BZ) where the resource is connected.
Measure Unit Quantity	[1]	Measure Unit	KWH kWh (kilowatt hour) MWH MWh (megawatt hour) KWT kW (kilowatt) MAW MW (megawatt)
Currency	[1]	Currency	ISO three-digit currency code, e.g.: DKK Denmark, krone EUR European Union, Euro NOK Norway, krone SEK Sweden, krona
Reserve Object	[0..1]	RO ID	See dependency matrix below
Direction	[1]	Direction	A01 Up A02 Down A03 UP and DOWN (symmetrical) For supportive power (incl. transit) the Direction is related to Up- or Down-regulation in the Connecting Area. When reporting Capacity Reserves (Document Type = A81) and Reason Code from Z42 to Z45 , the direction A03 (UP and DOWN (symmetrical)) shall be used.
Reason (Allocation Result Time Series Level)	[1]		1st REPETITION
Reason Code	[1]	Reason Code	Z22 Supportive power Z26 Transit triangle

BRS for Nordic Balance Settlement for data exchange between eSett and TSOs/Market Operators

Ediel ERRP Reserve Allocation Result Document Attribute	Cl.	Content	Descriptions and comments
			<p>Z27 Transit redispatch</p> <p>Z28 Transit SB Loop Long</p> <p>Z29 FCR (Frequency Containment Reserve (FCR) is an automatic and momentarily regulation, to adjust the physical balance in the power system)</p> <p>Z30 aFRR (Frequency Restoration Reserve - Automatic (aFRR) is an automatic reserve, activated continuously by the frequency)</p> <p>Z31² mFRR, Balancing Power (Frequency Restoration Reserve - Manual activated reserves (mFRR), Balancing Power)</p> <p>Z34 mFRR, Quarter regulation (Frequency Restoration Reserve - Manual activated reserves (mFRR), Quarter regulation when TSO need transfer of production (usually start 15 min earlier))</p> <p>Z35³ mFRR, Special Regulation (Frequency Restoration Reserve - Manual activated reserves (mFRR), Special Regulation where regulation does not affect the regulation price)</p> <p>Z36 Hour Change Regulation (to reduce problems encountered at the turn of the hour in the Nordic countries or in Finland, Fingrid reserves the right to transfer the planned changes to begin 15 minutes before or after the planned moment)</p> <p>Z37 Power Transaction (Fixed price transaction used for specific purposes outside of ordinary regulation)</p> <p>Z38 TSO Internal Countertrades (The time series concern TSO Internal Countertrades)</p> <p>Z39 Day Ahead Production Adjustment (Energy (production) moved from one hour to another to avoid major changes between hours)</p> <p>Z40 Frequency Containment Reserve, Normal operation (FCR-N).</p> <p>Z41 Frequency Containment Reserve, Disturbance (FCR-D).</p> <p>Z42 Frequency Containment Reserve, Normal operation, day minus one (FCR-N, late)</p> <p>Z43 Frequency Containment Reserve, Normal operation, day minus one (FCR-N, early)</p> <p>Z44 Frequency Containment Reserve, Normal operation, day minus one, correction (FCR-N, late correction)</p> <p>Z45 Frequency Containment Reserve, Normal operation, day minus one, correction (FCR-N, early correction)</p> <p>Z46 Frequency Containment Reserve, Disturbance, day minus one (FCR-D, late)</p> <p>Z47 Frequency Containment Reserve, Disturbance, day minus one (FCR-D, early)</p>

² Balancing power (**Z31**) can be direct activation (**Z59**) in case forecasted need for Balancing Power is not correct.

³ In many cases Special/system Regulations (**Z35**) can be scheduled since they are known early. In those cases, the activation is scheduled activation (**Z58**). If the special/system regulation need comes suddenly, then the activation will be direct activation (**Z59**)

BRS for Nordic Balance Settlement for data exchange between eSett and TSOs/Market Operators

Ediel ERRP Reserve Allocation Result Document Attribute	Cl.	Content	Descriptions and comments
			Z48 Frequency Containment Reserve, Disturbance, day minus one, correction (FCR-D, late correction) Z49 Frequency Containment Reserve, Disturbance, day minus one, correction (FCR-D, early correction) Z54 Activation by AOF (Activation Optimisation Function) Z55 Manual activation not based on AOF Z56 Fast Frequency Reserve (FFR) Z63 Period shift activation Z76 mFRR, correction Z75 aFRR, correction
Reason (Allocation Result Time Series Level)	[0..1]		<p style="text-align: center;">2ND REPETITION</p> <p>Dependency: Shall be used if the following reason codes is specified in the first repetition of the Reason class:</p> <p>Z31 mFRR, Balancing Power (Frequency Restoration Reserve - Manual activated reserves (mFRR), Balancing Power) Z35 mFRR, Special Regulation (Frequency Restoration Reserve - Manual activated reserves (mFRR), Special Regulation where regulation does not affect the regulation price)</p>
Reason Code	[1]	Reason Code	Z58 Scheduled activation Z59 Direct activation Z60 Faster activation Z61 Faster deactivation Z62 Slower activation
Period	[1..*]		
Time Interval	[1]	Start and end date time	The start and end date and time of the time interval of the period in question.
Resolution	[1]	Resolution	The resolution is expressed in compliance with ISO 8601 in the following format: <p style="text-align: center;">PnYnMnDTnHnMnS.</p> Where nY expresses a number of years, nM a number of months, nD a number of days. The letter "T" separates the date expression from the time expression and after it nH identifies a number of hours, nM a number of minutes and nS a number of seconds. In NBS hourly or quarterly resolution is used, i.e., PT1H , PT60M or PT15M .
Interval	[1..*]		
Pos	[1]	Position	Position
Qty	[1]	Quantity	Quantity The resolution is maximum in Watt, i.e., max 3 decimals for kWh and max 6 decimals for MWh

BRS for Nordic Balance Settlement for data exchange between eSett and TSOs/Market Operators

Ediel ERRP Reserve Allocation Result Document Attribute	Cl.	Content	Descriptions and comments															
Settlement Amount	[1]	Amount	<p>Rules for the supportive power (incl. transit) – Reason Codes Z22, Z26, Z27 and Z28</p> <ul style="list-style-type: none"> The Acquiring Area is always related to the Buyer and the Connecting Area is always related to the Seller. Positive values are used when the energy direction is from the Connecting Area to the Acquiring Area, i.e., up-regulation. Negative values are used when the energy direction is from the Acquiring Area to the Connecting Area, i.e., down-regulation. <p>Rules for other Reason Codes:</p> <ul style="list-style-type: none"> Settlement Amount is always Quantity multiplied with price. The table below shows the sign convention to be used: <table border="1" data-bbox="834 792 1505 996"> <thead> <tr> <th></th> <th>Price</th> <th>Sign when sending from TSO to eSett</th> </tr> </thead> <tbody> <tr> <td>Up regulation (A01)</td> <td>Positive</td> <td>Negative</td> </tr> <tr> <td>Up regulation (A01)</td> <td>Negative</td> <td>Positive</td> </tr> <tr> <td>Down regulation (A02)</td> <td>Positive</td> <td>Positive</td> </tr> <tr> <td>Down regulation (A02)</td> <td>Negative</td> <td>Negative</td> </tr> </tbody> </table> <ul style="list-style-type: none"> When positive prices, up-regulation means negative Settlement Amount while down-regulation means positive Settlement Amount. Opposite sign occurs when prices are negative. 		Price	Sign when sending from TSO to eSett	Up regulation (A01)	Positive	Negative	Up regulation (A01)	Negative	Positive	Down regulation (A02)	Positive	Positive	Down regulation (A02)	Negative	Negative
	Price	Sign when sending from TSO to eSett																
Up regulation (A01)	Positive	Negative																
Up regulation (A01)	Negative	Positive																
Down regulation (A02)	Positive	Positive																
Down regulation (A02)	Negative	Negative																

Table 6: Attribute usage: Ediel ERRP Reserve Allocation Result Document

5.3.4 Dependency matrix: Ediel ERRP Reserve Allocation Result Document

Process type	Business type	Doc. Type	Direction	Reason Code, 1 st repetition	Reason Code, 2 nd repetition	Tendering Party	Reserve Object	Used in			
								DK	FI	NO	SE
A30 (Tertiary reserve process)	A10 (Tertiary control)	A38	A01 or A02	Z22 Supportive power	N/A	TSO	N/A		✓		
				Z26 Transit triangle	N/A	TSO	N/A			✓	
				Z27 Transit redispatch	N/A	TSO	N/A			✓	
				Z28 Transit SB Loop Long	N/A	TSO	N/A			✓	
				Z31 mFRR, Balancing Power (NO: Ordinary regulation)	Z58 Scheduled activation Z59 Direct activation Z60 Faster activation Z61 Faster deactivation Z62 Slower activation	BRP	✓	✓	✓	✓	✓
				Z34 mFRR, Quarter regulation	N/A	BRP	✓			✓	
				Z35 mFRR, Special Regulation (NO: Specially regulation)	Z58 Scheduled activation Z59 Direct activation Z60 Faster activation Z61 Faster deactivation Z62 Slower activation	BRP	✓	✓	✓	✓	
				Z36 Hour Change Regulation (NO: Move of production)	N/A	BRP	✓		✓	✓	
				Z37 Power Transaction	N/A	BRP	✓		✓		
				Z38 TSO Internal Countertrades (Only used in Finland)	N/A	BRP	✓		✓		
				Z39 Day Ahead Production Adjustment (NO: Production smoothing)	N/A	BRP	✓		✓	✓	✓
				Z54 Activation by AOF (Activation Optimisation Function)	N/A	BSP	✓	✓	✓	✓	✓
Z55 Manual activation not based on AOF	N/A	BSP	✓	✓	✓	✓	✓				

BRS for Nordic Balance Settlement for data exchange between eSett and TSOs/Market Operators

Process type	Business type	Doc. Type	Direction	Reason Code, 1 st repetition	Reason Code, 2 nd repetition	Tendering Party	Reserve Object	Used in						
								DK	FI	NO	SE			
				Z63	Period shift activation	N/A	BRP	✓			✓			
				A81	A01 or A02	Z31	mFRR, Balancing Power (NO: Ordinary regulation)	N/A	BRP or BSP	N/A	✓			✓
						Z35	mFRR, Special Regulation (NO: Specially regulation)	N/A	BRP or BSP	N/A	✓			✓
						Z76	mFRR, correction	N/A	BRP or BSP	N/A				✓
A28 (Primary reserve process)	A11 (Primary control)	A38	A01 or A02	Z29	FCR	N/A	BRP	✓		✓	✓	✓		
		A38	A01 or A02	Z40	Frequency Containment Reserves, Normal (FCR-N)	N/A			✓			✓		
		A38	A01 or A02	Z41	Frequency Containment Reserves, Disturbance (FCR-D)	N/A						✓		
A28 (Primary Reserve process)	A11 (Primary control)	A81	A01, A02 or A03	Z29	FCR	N/A	BRP or BSP	N/A	✓			✓		
				A03	Z42	FCR-N, late			N/A	✓			✓	
					Z43	FCR-N, early			N/A	✓			✓	
					Z44	FCR-N, late correction			N/A	✓			✓	
				A03	Z45	FCR-N, early correction			N/A	✓			✓	
			Z46		FCR-D, late	N/A			✓			✓		
			A01 or A02	Z47	FCR-D, early	N/A			✓			✓		
				Z48	FCR-D, late correction	N/A			✓			✓		
				Z49	FCR-D, early correction	N/A			✓			✓		
			A01 or A02	Z56	FFR	N/A			✓			✓		
A29 (Secondary)	A12 (Secondary control)	A38	A01 or A02	Z30	aFRR	N/A	BRP	✓	✓	✓	✓	✓		
				Z54	Activation by AOF	N/A	BSP	✓	✓	✓	✓	✓		

BRS for Nordic Balance Settlement for data exchange between eSett and TSOs/Market Operators

Process type	Business type	Doc. Type	Direction	Reason Code, 1 st repetition	Reason Code, 2 nd repetition	Tendering Party	Reserve Object	Used in			
								DK	FI	NO	SE
reserve process)				Z55 Manual activation not based on AOF	N/A	BSP	✓	✓	✓	✓	✓
A29 (Secondary reserve process)	A12 (Secondary control)	A81	A01 or A02	Z30 aFRR	N/A	BRP or BSP	N/A	✓			✓
				Z75 aFRR, correction	N/A	BRP or BSP	N/A				✓

Table 7: Dependency matrix: Ediel ERRP Reserve Allocation Result Document

5.4 Ediel ECAN Publication Document

The *Publication document* is used for summaries from all markets within the Nordic trading system. The document is based on the *Publication Document* from the ENTSO-E ECAN IG, see [1].

5.4.1 Class diagram: Ediel ECAN Publication document

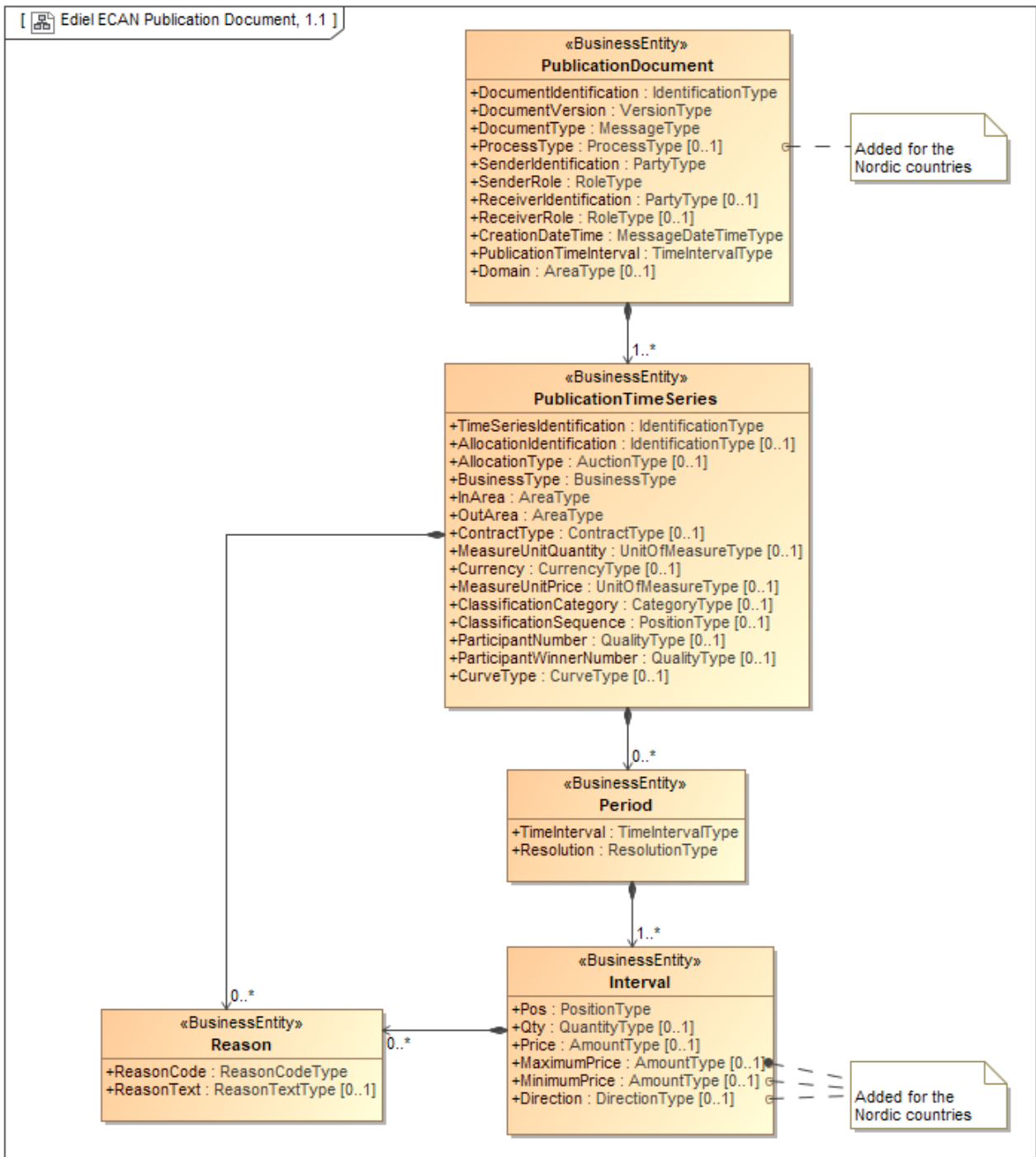


Figure 12: Class diagram: Ediel ECAN Publication Document

BRS for Nordic Balance Settlement for data exchange between eSett and TSOs/Market Operators

The document is used in the following exchanges:

- Overview of information exchange for the NBS scheduling phase **Error! Reference source not found.:**
 - 2.3, Spot prices (Day-ahead sales report) **Error! Reference source not found.**
 - 5.4, Balance regulation market prices **Error! Reference source not found.**

5.4.2 Attribute usage: Ediel ECAN Publication Document

Ediel ECAN Publication Document Attribute	Cl.	Content	Descriptions and comments
Allocation Result Document	[1]		
Document Identification	[1]	Document ID	Unique identification of the document
Document Version	[1]	"1"	Fixed 1
Document Type	[1]	A44	A44 Price document
Process Type	[1]	Process Type	A01 Day-ahead A30 Tertiary reserves process A51 Automatic frequency restoration reserve Z15 External trade (Trade outside the Capacity Calculation Region)
Sender Identification	[1]	SO or MO ID	Identification of the party who is sending the document
Sender role	[1]	Sender Role	A04 System Operator A11 Market Operator
Receiver Identification	[1]	ISR ID	Identification of the Imbalance Settlement Responsible, who is receiving the document
Receiver role	[1]	A05	A05 Imbalance Settlement Responsible
Creation Date Time	[1]	Creation date/time	The date and time that the message was prepared for transmission by the application of the sender.
Publication Time Interval	[1]	Start and end date of the time series	The beginning and ending date and time of the period covered by the document.
Domain	[1]	Nordic Market Area ID	Identification of the area covered by the document, i.e., 10Y1001A1001A91G (Nordic market area)
Publication Time Series	[1..*]		
Time Series Identification	[1]	Time series ID	Unique identification of the Time Series (unique over time for the sender in question)
Business Type	[1]	Business Type	A06 External trade without explicit capacity (used for the North Sea Link cable). A62 Spot price B20 Balance up regulation price B21 Balance down regulation price B22 Main direction (no price) B23 Consumption imbalance price B24 Production sales imbalance price B25 Production purchase imbalance price B26 BZs prices between Bidding Zones (inter-TSO exchange) Z74 Imbalance sales price Z75 Imbalance purchase price Note regarding Business Type B24 and B25: The view for reporting of sales and purchases is seen from the Imbalance Settlement Responsible (not the BRP).

BRS for Nordic Balance Settlement for data exchange between eSett and TSOs/Market Operators

Ediel ECAN Publication Document Attribute	Cl.	Content	Descriptions and comments
			Business Type A06 is used together with Process Type Z15 .
In Area	[1]	BZ ID	Relevant Bidding Zone (BZ) for the market
Out Area	[1]	BZ ID	Same as In Area for all Business Types, except “ B26 BZs prices between Bidding Zones”, where the second border-BZ is used
ContractType	[0..1]	Contract types	Contract types: A14 First intraday auction contract A15 Second intraday auction contract A16 Third intraday auction contract
Currency	[1]	Currency	ISO three-digit currency code, e.g.: DKK Denmark, krone EUR European Union, Euro NOK Norway, krone SEK Sweden, krona
Measurement Unit Price	[1]	MWH	MWH MWh
Period	[1..*]		
Time Interval	[1]	Start and end date time	The start and end date and time of the time interval of the period in question.
Resolution	[1]	Resolution	The resolution is expressed in compliance with ISO 8601 in the following format: PnYnMnDTnHnMnS. Where nY expresses a number of years, nM a number of months, nD a number of days. The letter “T” separates the date expression from the time expression and after it nH identifies a number of hours, nM a number of minutes and nS a number of seconds. In NBS hourly or quarterly resolution is used, i.e., PT1H , PT60M or PT15M .
Interval	[1..*]		
Pos	[1]	Position	Position
Price	[0..1]	Price	Price
Direction	[0..1]	Direction	A01 Up A02 Down A04 Stable Only used if Business Type is B22 <i>Main direction</i>

Table 8: Attribute usage: Ediel ECAN Publication Document

6 Acknowledgements

NBS will follow the ENTSO-E acknowledgment process [1]:

- A document is controlled within the system environment at two levels:
 1. It is first controlled at system level to detect syntax errors (XML parsing errors, file-processing errors, etc.).
 2. It is then controlled at the application level to detect any semantic errors (invalid data, wrong process, etc.).
- If there is a problem encountered at the first level, then a technical acknowledgement will be sent to inform the originator of the problem.
- If errors are encountered at the second level, a negative application acknowledgement will be sent to inform the originator of the problem.
- If the application can successfully process the information, then a positive application acknowledgement will be sent to inform the originator that the original document is accepted.

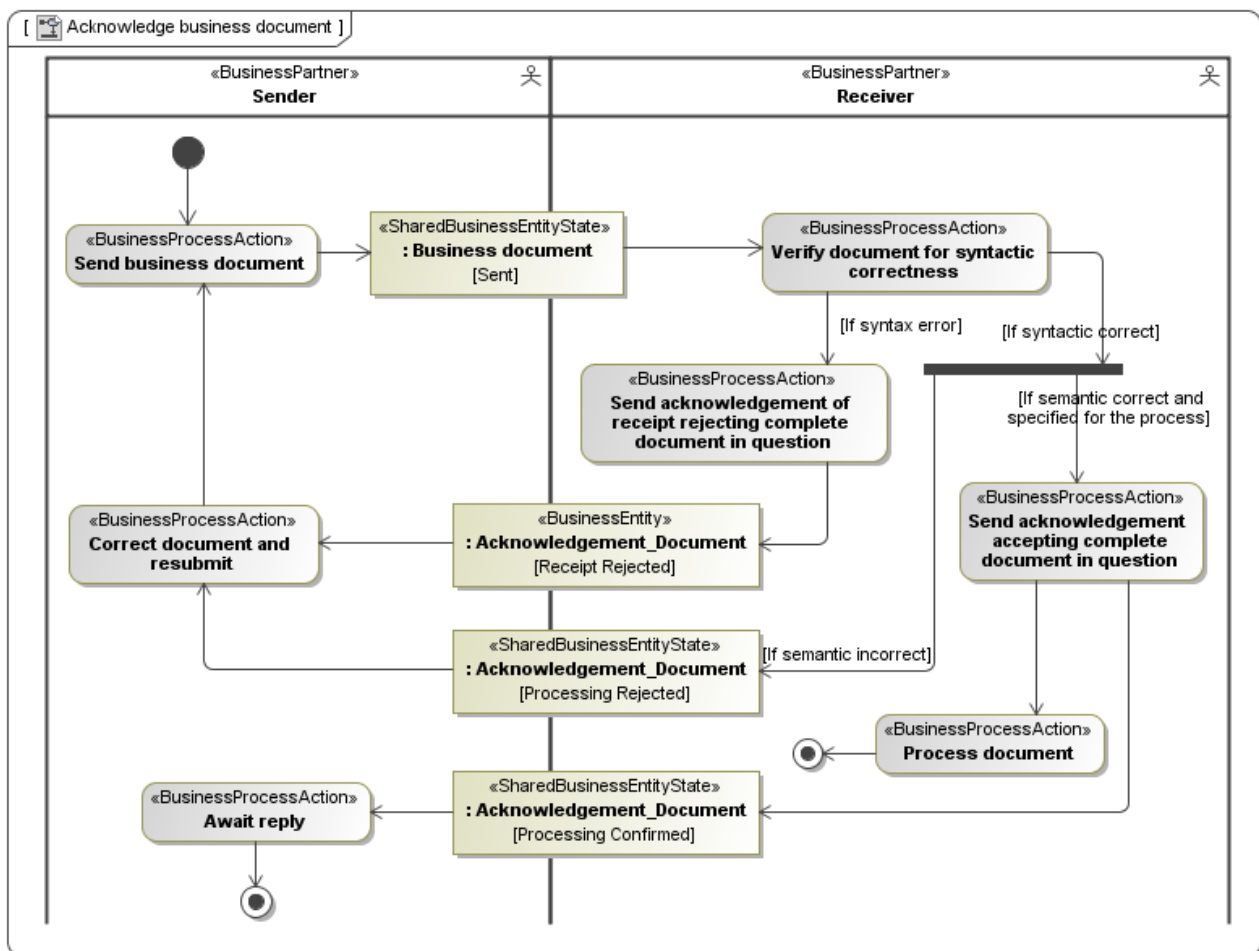


Figure 13: Activity diagram: ENTSO-E Acknowledgement process

Details of the acknowledgment document are found in *Common Nordic XML rules and recommendations* [11].

6.1 NBS requirements for acknowledgements

6.1.1 All or Nothing Principle

The all-or-nothing principle will be used for acknowledgements from eSett. This means that documents are accepted only if the documents contain no errors. If a document contains at least one error, it will be fully rejected, and no partial acceptance will be applied. However, if errors are found in a document, the rest of the document will be gone through, and all errors found will be added in the response (if possible).

6.1.2 Positive acknowledgements

eSett will send positive acknowledgements on all received documents. Similarly, eSett require acknowledgements in return for all documents sent to the actors.

7 Technical business rules

7.1 Time Series Identification (Time Series ID)

The *Time Series Identification* shall be a unique ID over time for the originator (sender) of a time series. I.e., every time a time series changed, the originator shall issue a new *Time Series ID*.

Note that this is a Nordic rule that is stricter than what is stated in the ENTSO-E implementation guides, which only requires the Time Series Identification to be unique within the document.

7.2 Usage of Resolution and Position

The resolution of a time series period shall always be one hour or 15 minutes, expressed according to ISO 8601, i.e., **PT1H**, **PT60M** or **PT15M**.

The time interval defined in the period class shall always be a multiple of its resolution.

The position (eBIX[®] term: Sequence) must begin with 1 and increment by 1 for each subsequent position forming a series of contiguous numbers covering the complete range of the Period.

Appendix A Identifying sender and recipient in communication headers

It is assumed that there will be a SOAP envelope or similar that will contain the physical sender ID and recipient ID of an information exchange. The parties identified in this envelope will be the same parties as today are transmitted in the EDIFACT UNB segment. These parties may be the “juridical parties”, i.e., the parties responsible for the content of the document, or third parties acting on behalf of the parties responsible for the content of the document.

The document header will contain the “juridical parties”, i.e., the parties responsible for the content of the document. For instance, the responsible DSO or Balance Responsible Parties will be explicitly identified in the document header. The parties identified in this document header will be the same parties as today are transmitted in the EDIFACT NAD segments.