

OPINION No 04/2023
OF THE EUROPEAN UNION AGENCY
FOR THE COOPERATION OF ENERGY REGULATORS

of 4 April 2023

**on electricity projects in the draft ENTSO-E Ten-Year Network
Development Plan 2022 and in the National Development Plans**

THE EUROPEAN UNION AGENCY FOR THE COOPERATION OF ENERGY
REGULATORS,

Having regard to Regulation (EU) 2019/942 of the European Parliament and of the Council of 5 June 2019 establishing a European Union Agency for the Cooperation of Energy Regulators¹, and, in particular, Articles 4(3)(b) and Article 4(5) thereof,

Having regard to Regulation (EU) 2019/943 of the European Parliament and of the Council of 5 June 2019 on the internal market for electricity, and, in particular, Article 32(1), Article 32(2) and Article 48(2) thereof,

Having regard to the outcome of the consultation with the Agency's Electricity Working Group,

Having regard to the favourable opinion of the Board of Regulators of 29 March 2023, delivered pursuant to Article 22(5) of Regulation (EU) 2019/942,

Whereas:

1. INTRODUCTION

- (1) Article 32(2) of Regulation (EU) 2019/943 requires the European Network of Transmission System Operators for Electricity ('ENTSO-E') to submit the draft Union-wide network development plan ('the EU TYNDP') to the European Agency for the Cooperation of Energy Regulators ('the Agency') for its opinion.
- (2) Pursuant to Article 4(3)(b) of Regulation (EU) 2019/942, the Agency may provide an opinion to ENTSO-E, in accordance with the first subparagraph of Article 32(2) of Regulation (EC) 2019/943, on the EU TYNDP, taking into account the objectives of non-

¹ OJ L158, 14.6.2019, p. 22.

discrimination, effective competition and the efficient and secure functioning of the internal markets in electricity and natural gas.

- (3) Pursuant to Article 4(5) of Regulation (EU) No 2019/942, the Agency shall, based on matters of fact, provide a duly reasoned opinion as well as recommendations to ENTSO-E, the European Parliament, the Council and the Commission, where it considers that the draft TYNDP does not contribute to non-discrimination, effective competition and the efficient functioning of the market or a sufficient level of cross-border interconnection open to third-party access, or do not comply with the relevant provisions of Regulation (EU) 2019/943 and Directive (EU) 2019/944.
- (4) The second subparagraph of Article 32(2) of Regulation (EU) 2019/943 requires that the Agency provides, within two months from the day of receipt, a duly reasoned opinion as well as recommendations to ENTSO-E and to the Commission where it considers that the draft TYNDP submitted by ENTSO-E does not contribute to non-discrimination, effective competition, the efficient functioning of the market or a sufficient level of cross-border interconnection open to third-party access.
- (5) Article 48(2) of Regulation (EU) 2019/943 tasks the Agency to assess the consistency of the national ten-year network development plans ('the NDPs') with the EU TYNDP. If the Agency identifies inconsistencies between a NDP and the EU TYNDP, it shall recommend amending the NDP or the EU TYNDP as appropriate. If such NDP is elaborated in accordance with Article 51 of Directive (EU) 2019/944 of the European Parliament and of the Council, the Agency shall recommend that the competent national regulatory authority ('NRA') amend the NDP in accordance with Articles 51(7) and 51(8) of that Directive and inform the Commission thereof.
- (6) Article (11) points a) and b) of Regulation (EU) No 2019/943 tasks the Agency with monitoring the progress regarding the implementation of investments to create new interconnection capacity and the implementation of the EU TYNDP.
- (7) In addition, recital (12) of Regulation (EU) No 2019/943 emphasises the Agency's essential role in monitoring regional cooperation between transmission system operators ('TSOs') as well as the execution of the tasks of ENTSO-E, to ensure that the cooperation between TSOs proceeds in an efficient and transparent way for the benefit of the internal market in electricity.
- (8) The Agency considers as 'national ten-year network development plans' pursuant to Article 48 of Regulation (EU) 2019/943 all relevant network planning instruments, even if they are referred to with a different title (e.g. investment plan) or a different time span.
- (9) This Opinion provides the Agency's assessment on the projects included in the draft EU TYNDP 2022, including an assessment of consistency of the projects in the NDPs of the EU Member States and an European Economic Area ('EEA') Member State (Norway) with the projects in the draft EU TYNDP 2022.

2. PROCEDURE

- (10) On 25 November 2022, the Agency invited the NRAs of EU Member States and other NRAs participating in the relevant Agency's working structures to review projects and corresponding investments in the already published version of the draft EU TYNDP 2022 which are located on the territory of their country and assess them, including their consistency with projects in NDPs.
- (11) On 31 January 2022, ENTSO-E submitted the draft EU TYNDP 2022 to the Agency. Following the formal submission of the draft TYNDP 2022 by ENTSO-E to the Agency, the Agency consolidated its findings based on the data corresponding to the formal submission.
- (12) In this regard, the Agency notes that the publicly consulted version of the draft EU TYNDP 2022 does not include transmission investments 1832, 1833, 1834, 1835 and 1836² (all belonging to project 259 'HU-RO' interconnection), which appear in the version submitted to the Agency. Based on the information provided by the Romanian NRA, all these investments were reported under investment number 1205 in the publicly consulted version, but following the TSO's request at the end of 2022, the investments were separated. In addition, investment 1826 (at least under this code) has been removed compared to the publicly consulted version.
- (13) NRAs have provided the Agency with specific information on the national parts³ of transmission investments and storage projects that are/were:
- included in the draft EU TYNDP 2022,
 - included in the EU TYNDP 2020, but not in the draft EU TYNDP 2022 and
 - cross-border relevant and appear in their NDPs, but not in the draft EU TYNDP 2022.
- (14) The data collection from NRAs was completed on 14 March 2023. By this date, NRAs from 27 EU Member States and one EEA Member State (Norway) provided input to the Agency. The list of the participating countries along with the number and share of the reviewed transmission investments and storage projects is presented in Table 8 in Annex I.

² The Romanian NRA explains all the listed investments are included in the Romanian NDP and the NRA has not identified any inconsistency with the draft EU TYNDP 2022.

³ In this Opinion, a project may be composed by one or more investments. The part of the draft EU TYNDP 2022 investment which belongs to a country is called 'national part of an investment'. E.g. if an investment is an interconnector between countries A and B, it is considered that there are two national parts: one consisting of the part of the investment located in country A, and the other consisting of the part of the investment located in country B.

- (15) Out of the 314 transmission investment items and storage projects included in the draft EU TYNDP 2022, the Agency reviewed NRA responses for 262⁴ investments regarding their consistency with the latest national development plans. 58 investment items belong to more than one country and are, therefore, reviewed by more than one NRA, leading to a total assessment of 348 national parts of transmission investments and storage projects (325 investment items and 23 storage projects).

3. GENERAL INFORMATION ABOUT THE PROJECTS IN THE DRAFT EU TYNDP 2022

- (16) The draft EU TYNDP 2022 contains an assessment and a description of 141 transmission projects, with 291 corresponding investment items and 23 storage projects. The Agency notes that additional four transmission and three storage projects applied for inclusion in the draft EU TYNDP 2022, but were rejected due to non-compliance with the draft EU TYNDP 2022 project Inclusion Guidelines⁵ ('Inclusion Guidelines'). Table 1 illustrates the number of transmission projects and investments as well as storage projects of the draft EU TYNDP 2022 compared to the previous four EU TYNDPs.

Table 1: Number of transmission and storage projects in the draft EU TYNDP 2022 and in the four previous EU TYNDPs

		EU TYNDP 2014	EU TYNDP 2016	EU TYNDP 2018	EU TYNDP 2020	Draft EU TYNDP 2022
Transmission	Number of projects	127	168	165	154	141
	Number of investments	371	420	359	321	291
Storage	Number of projects	11	23	20	26	23

- (17) The classification of the transmission projects according to the number of investment items included in each project in the draft EU TYNDP 2022 is presented in Table 2.

Table 2: Classification of transmission projects in the draft EU TYNDP 2022

	Number of transmission projects in the draft EU TYNDP 2022
Projects consisting of 1 investment	89
Projects consisting of 2 investments	23
Projects consisting of 3 investments	9
Projects consisting of 4 investments	7
Projects consisting of 5 investments	6
Projects consisting of 6 investments	2
Projects consisting of 7 investments	2
Projects consisting of 9 investments	1
Projects consisting of 12 investments	1

⁴ The remaining investments were not reviewed, as they do not belong to a territory of an EU/EEA Member State.

⁵ https://eepublicdownloads.blob.core.windows.net/public-cdn-container/tyndp-documents/TYNDP2022/portfolio/220121_TYNDP2022_draft_project_portfolio.xlsx

	Number of transmission projects in the draft EU TYNDP 2022
Projects consisting of 24 investments	1

(18) The Agency acknowledges the reduction of the average number of investment items per project⁶ over time which is considered a positive sign of increased efforts to avoid over clustering of investments.

(19) Table 3 represents the total number as well as the total costs of transmission investment items and storage projects according to their status, as provided in the draft EU TYNDP 2022 project sheets.

Table 3: Cost of transmission investments and storage projects according to their status

Investment status	Transmission investments		Storage projects	
	Number	Cost (billion EUR)	Number	Cost (billion EUR)
Under consideration	83	62.56	10	3.52
Planned, but not yet in permitting	89	23.94	1	0.47
In permitting	71	42.33	12	4.85
Under construction	39	5.06	0	0
Total	282⁷	133.89⁸	23	8.84

(20) The Agency notes that in 2022, the declining trend of the number of transmission investments and the related costs in the EU TYNDP since 2016 further continues⁹. While the share of investments in advancement status ‘under consideration’ remains at 30% and ‘in permitting’ around 25%, the shares of the ‘planned, but not yet in permitting’ and ‘under construction’ slightly changed, i.e. increased by 6 % and decreased by 5 % respectively. Moreover, the number of storage projects in the draft EU TYNDP 2022 slightly decreased after its increase two years ago and the corresponding costs almost halved.

⁶ The average number of investments per project has gradually decreased from 2.92 for the TYNDP 2014 to 2.06 for the draft TYNDP 2022. For TYNDP 2020, the average number was 2.08.

⁷ 9 investments are not included in the table, because according to the information provided in the draft EU TYNDP, they have already been completed or commissioned.

⁸ The total transmission investment cost does not include the total cost of investments 474 ‘Substation Ribeira de Pena’ and 1214 ‘Ejea de los Caballeros substation’ and operational expenditure (OPEX) of investments 1785 ‘Inkoo-Hikiä’, 1810 ‘HVDC converter stations and cables’, 1811 ‘Offshore Wind Connection Centre Manche 2’, 1812 ‘Offshore Wind Connection South Brittany’, 1808 ‘AO6 Occitanie’, 1809 ‘AO6 Occitanie’ and 1813 ‘Offshore wind connection South Atlantic’ which are not reported or reported to be 0 EUR in the draft EU TYNDP 2022.

⁹ For an assessment of whether the investments of the draft EU TYNDP 2022 are sufficient to reach the decarbonisation objectives, please refer to the Agency’s Opinion 03/2023 and the TYNDP 2022 System Needs Study carried out by ENTSO-E.

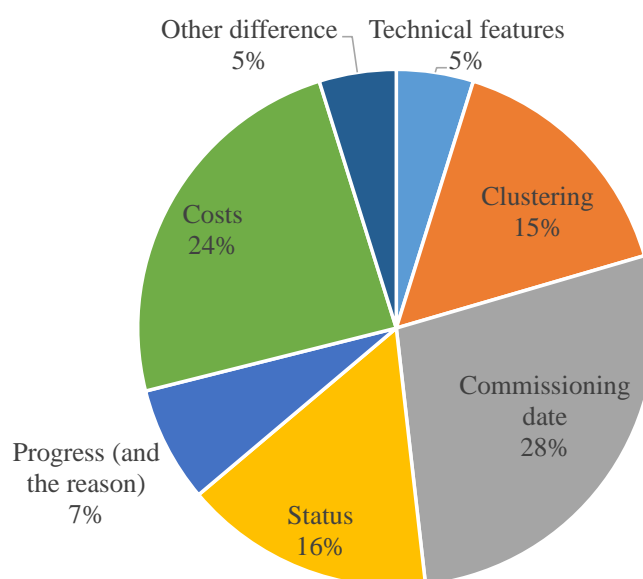
- (21) The Agency notes that the draft EU TYNDP 2022 reports 27% of these investments are new, 45% are on time, 3 % are ahead of time, 14% are delayed and 11 % are rescheduled compared to the TYNDP 2020.
- (22) The Agency finds that at least one interconnection investment, i.e. investment 1772 ‘Roost-Flebour-Bauler’ has a different status across the borders. In Luxembourg, the national part of the investment is completed, while in Germany it is ‘planned, but not yet in permitting’. A difference in investment status across borders does not necessarily constitute an inconsistency, but could point to limited cross-border coordination, which may be improved.
- (23) The Agency also identified some interconnections (which have been fully monitored in this Opinion and already achieved at least ‘planned, but not yet in permitting’ status) for which NRAs indicated different commissioning dates for the implementation of their national parts¹⁰. However, in none of these instances the difference exceeds one year. Also here, the Agency notes that the smaller difference across commissioning dates is not necessarily an inconsistency, though the Agency would expect commissioning dates of interconnectors to be reasonably aligned.
- (24) A total number of 92 transmission investments and 10 storage projects were present in the TYNDP 2020 but not in the draft EU TYNDP 2022. Out of these, 78 transmission investments and 7 storage¹¹ projects are at least partly located on the territory of an EU or EEA Member State. Out of these 78 transmission investments and 7 storage projects, approximately 30% are commissioned and another 30% cancelled. Around 10% were not compliant to the Inclusion Guidelines, while the remaining are still under development or their status is not available to the NRA.
- (25) In addition to the cross-border relevant investments identified by NRAs during former investment review activity (which are neither included in the TYNDP 2020 nor in the draft EU TYNDP 2022), the participating NRAs reported on six cross-border relevant investments not included in the draft TYNDP 2022, but in the relevant NDPs.
- (26) For about 51% out of the 291 transmission investment items in the draft EU TYNDP 2022, the NRAs indicated no difference between the features of the investment as included or present in the latest NDP and the draft EU TYNDP 2022 (or the difference resulted from the fact that their NDP is outdated). For about 20%, at least some difference was identified. Approximately 29% were not able to be assessed on any aspect by the NRAs mainly due to their absence in the NDP. These investments are listed in Table 9 in Annex I. Most of them are in a very early stage of development.

¹⁰ Investments 256 ‘New interconnection line BG-GR by a 153km single circuit 400kV OHL’, 1211 ‘HVDC Aragon region-Marsillon’, 1630 ‘AC Overhead Line Aach-Bofferdange’ and 1772 ‘Roost-Flebour-Bauler’

¹¹ The remaining 14 transmission projects are located in Bosnia, Egypt, Switzerland and United Kingdom and the remaining 3 storage projects in United Kingdom.

- (27) Figure 1 represents the shares of various inconsistencies between the information provided in the draft EU TYNDP 2022 and the latest NDPs, as indicated by the NRAs. The main inconsistency between transmission investment items included in the latest NDP and draft EU TYNDP 2022 is a different expected commissioning (23 instances), followed by different costs (20 instances), different clustering (13 instances), different status (13 instances), different progress (6 instances) and technical features (4 instances). Detailed information is provided in Table 10 in Annex I.

Figure 1: Differences between the information provided in the draft EU TYNDP 2022 and the latest NDP



- (28) The Agency acknowledges that the NDPs and the EU TYNDP may temporarily be misaligned due to different schedules for the elaboration of the plans and other reasons (e.g. changes in market fundamentals), which, to some extent, can explain the identified differences and does not necessarily constitute an inconsistency between the plans.
- (29) For vast majority of investments with a clearly identified difference in the commissioning dates¹², the commissioning date reported in the draft EU TYNDP 2022 was an earlier date compared to the NRA's information. Furthermore, for half of the (non-yet commissioned) investments with different advancement status, NRAs identified a more advanced status in the draft EU TYNDP 2022 compared to their information.

¹² Not accounting for those instances where the NRA provided a range for the commissioning date matching also the date provided in the draft TYNDP 2022 or where the NRA flagged a difference without providing a commissioning date.

- (30) Regarding storage projects, the Agency notes that no difference has been identified by the NRAs for 4 projects¹³ and the remaining projects the NRA was not able to assess.
- (31) In order to increase the accuracy of the project and investment data of the draft EU TYNDP 2022, the Agency considers it important that the NRA scrutiny of the projects provided in Annex I to this Opinion, is taken into account for the final EU TYNDP 2022, as appropriate.

4. ASSESSMENT OF THE PROJECTS IN THE NDPs AND THE EU TYNDP

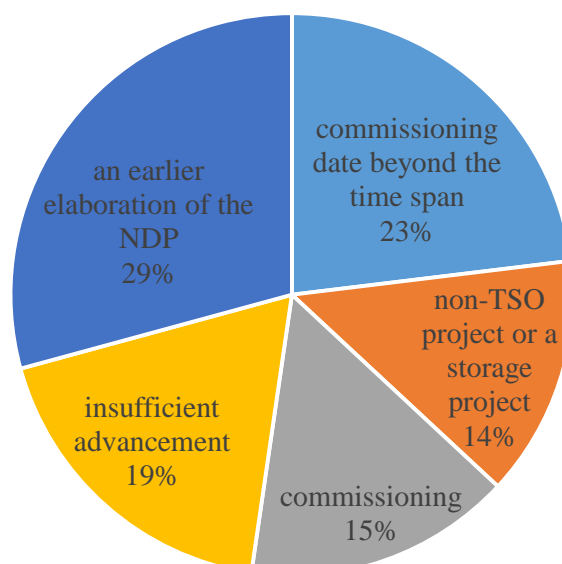
4.1. Investments in the draft EU TYNDP 2022 which are not included in the respective NDP(s)

- (32) Pursuant to Article 30(1)(b) and 48(1)(a) of Regulation (EU) 2019/943, ENTSO-E shall develop an EU TYNDP which is built on the NDPs.
- (33) The Agency welcomes the improved transparency regarding the information on the inclusion of a specific project in the respective NDPs (e.g. inclusion of this information in the excel project sheets, provision of the reasons for non-inclusions for some projects), however, it regrets that information on the non-inclusion along with the corresponding reason is not provided for all projects.
- (34) According to the information provided by NRAs, 80% of the 325 national parts of transmission investments are included in the relevant NDPs¹⁴, while 20% are not. The summary of reasons for these absences is provided in Figure 2. The most common reason for the absence is an earlier elaboration of the NDP than of the draft EU TYNDP (19 instances), followed by the commissioning date of the investment being beyond the time span of the NDP (15 instances), an insufficient advancement of the investment (12 instances), the investment having been commissioned (10 instances), the investment appertaining to a non-TSO project while such projects are normally not included or present in NDP (9 instances). Additional information is provided in Table 11 in Annex I.

¹³ 1003 ('Hydro-pumped storage in Bulgaria – Yadenitsa'), 1004 ('Estonian PHES'), 1006 ('HPS Amfilochia') and 1044 ('Green Hydrogen Hub CAES')

¹⁴ Including 14 transmission investments that are reported to only be described or mentioned in the NDP, without yet being approved.

Figure 2: Reasons for the absence of transmission investments in the draft EU TYNDP in the relevant NDPs



- (35) Regarding the storage projects, 17 projects out of the 23 are not included in the relevant NDPs¹⁵, mainly because they appertain to a non-TSO storage project (14 instances). The remaining absences are due to an earlier elaboration of the NDP than of the draft EU TYNDP 2022 (2 instances) and an insufficient advancement of the project (e.g. study not having turned into a project yet). More detailed information is provided in Table 12 in Annex I.
- (36) The Agency reiterates its view that actual implementation of the EU TYNDP transmission projects strongly relies on the NDPs. Non-inclusion of a transmission project (or part of it) in the NDP due to other reasons than the commissioning of a project, cancellation of a project, time difference in the elaboration of the plans or the limited scope of the NDP (e.g. when it does not include third-party projects) raises doubts about the credibility and feasibility of the implementation of the concerned projects. Therefore, the reason for non-inclusion in the NDP is an important information regarding the TYNDP transmission projects. Project's non-inclusion in the NDP should clearly be flagged and the reason for such absence should be provided in the EU TYNDP. Further, the Agency recalls its view that the NDPs' scope should include third-party projects¹⁶.

¹⁵ Among the six storage projects that are included in the relevant NDP, two (1001 'Kaunertal Extension Project' and 1035 'Ptolemaida Battery Energy Storage System') are reported to only be mentioned in the NDP.

¹⁶ The Agency's Opinion No 05/2021, p. 38-40

4.2. Investments with cross-border relevance not included in the draft EU TYNDP 2022

(37) Table 4 provides information on the current status or presence in the respective NDPs of one French-Italian, three Italian and two Romanian cross-border relevant transmission investments which were not included in the TYNDP 2020 nor are in the draft EU TYNDP 2022.

Table 4: Investments with cross-border relevance identified by NRAs during former investment review activity, but neither included in the TYNDP 2020 nor in the draft EU TYNDP 2022

Investment name	Reporting countries	Additional information by the NRA
HVDC Italy-France	France and Italy	commissioning expected in 2023
Italy - Switzerland S. Giacomo project	Italy	project no longer present in the Italian draft NDP 2023
Italian-Austrian interconnection ‘Dobbiaco (IT) – Austria (AT)’	Italy	project is planned but not yet in permitting
Italian substation in Volpago	Italy	project rescheduled due to permitting difficulties, currently ‘planned, but not yet in permitting’
OHL 400kV Oradea – Nadab	Romania	commissioned in 2021
OHL Nadab-Bekescsaba circ. 2 and works in Nadab 400kV substation	Romania	no longer in the NDP

(38) NRAs reported on the following four additional cross-border relevant investments that are included in the relevant NDP as a planned or more advance investment, but do not appear in the draft EU TYNDP 2022:

- Italian-Swiss AC line ‘*Regoledo (IT) – Switzerland*’, project ‘planned, but not yet in permitting’,
- Polish-Ukrainian AC line ‘*Interconnection 750 kV Rzeszów (PL) – Khmelnytska (UA) (reactivation on 400 kV)*’, project completed on the Polish side¹⁷,
- Romanian internal AC line ‘*400kV OHL Gadalin (RO) – Suceava (RO)*’, project ‘in permitting’,
- Romanian-Moldavian AC line ‘*400kV OHL Suceava (RO) – Balti (MD)*’, project ‘in permitting’;

(39) Additionally, NRAs flagged the following cross-border relevant investment with status ‘under consideration’ which do not appear in the draft EU TYNDP 2022:

¹⁷ The Polish NRA explains that the interconnection 750 kV Rzeszów – Khmelnytska exists, but has not been in operation since 1993. Currently, the interconnection is planned to be reactivated on 400 kV and NDP includes investments relevant to operation of this interconnection at 400 kV, however, its commissioning depends on the situation in Ukraine.

- Hungarian-Romanian AC line ‘*Installation of the second circuit of Békéscsaba (HU) – Nadab (RO) 400 kV cross-border line*’,
- Italian-French AC line ‘*Voltage upgrade Nava (IT) – S. Dalmas (FR)*’.

Table 13 in Annex I provides additional information on these investments.

- (40) The Agency notes that under the current EU TYNDP process, the inclusion of cross border relevant projects in the EU TYNDP solely depends on project promoters’ (‘PP’) voluntary applications, with a risk to bypass the EU-level scrutiny of a project, if the PP does not apply for inclusion in the EU TYNDP.
- (41) In line with its previous recommendation¹⁸, the Agency stresses that all the planned projects with cross-border relevance from the NDPs should be included in the EU TYNDP, and that cross-border relevant projects in the NDPs should be flagged explicitly.

4.3. Investments of TYNDP 2020 which are not present in the draft EU TYNDP 2022 and other cross-border relevant investments not included in the draft EU TYNDP 2022

- (42) A list of transmission investments and storage projects that were included in the EU TYNDP 2020, but are neither included in the draft EU TYNDP 2022 (nor is their absence explained by ENTSO-E) is provided in Tables 14 and 15 in Annex I. The Agency identifies a total of 78 such transmission investments and seven storage projects on the territory of EU and/or EEA Member States¹⁹.
- (43) Based on the information provided by the NRAs, the Agency identified that about one third of these investments (located in EU Member States and/or Norway) is already commissioned and another third cancelled. Approximately 10% failed to meet the criteria from the Inclusion Guidelines and the remaining share is still under development, postponed indefinitely by the PP or their status is not available to the NRA.
- (44) The Agency notes that two storage projects that were included in the EU TYNDP 2020 were not included in the draft EU TYNDP 2022 due to their non-compliance to the Inclusion Guidelines. Furthermore, the Irish NRA explained that project 1030 “*Mares Organic Power Energy Storage*” was not included in the draft EU TYNDP 2022, because it had been cancelled. For the remaining four storage projects located in EU Member States that are not present in the draft EU TYNDP 2022, NRAs were not able to provide information, mostly due to that fact that the project is a non-TSO project and the promoters have no reporting obligation to the NRA.

¹⁸ The Agency’s Opinion No 05/2021, p. 7

¹⁹ In total, including the territory of non-EU and non-EEA Member States, 92 transmission investments and 10 storage projects from the TYNDP 2020 are not present in the draft TYNDP 2022.

- (45) The Agency is of the view that all commissioned and cancelled investments should enter the subsequent EU TYNDP for monitoring purposes (i.e. without a CBA assessment). For the remaining investment which are no longer included in the draft EU TYNDP 2022 in comparison to the previous edition, a valid explanation for their non-inclusion should be provided in order to ensure appropriate transparency.

4.4. Projects which were rejected to be included in the draft EU TYNDP 2022 due to non-compliance with the ENTSO-E TYNDP Inclusion Guidelines

- (46) The Agency notes that four transmission and three storage projects applied for inclusion in the TYNDP 2022, but were rejected due to non-compliance with the Inclusion Guidelines. These projects and the reasons for non-compliance are listed in table 5.

Table 5: Projects that have applied for inclusion in the draft TYNDP 2022, but were not compliant with the Inclusion Guidelines

	Project number	Project name	Reason for non-compliance
Transmission	284	LEG1	PP ceased to exist, so the project does not comply with mandatory criteria of company existence.
	296	Britib	PP did not prove compliance with any of the additional administrative criteria e) to k) from the Inclusion Guidelines.
	1077	Crete-North Greece-North Macedonia-Bulgaria Interconnector	PP ceased to exist, so the project does not comply with mandatory criteria of company existence.
	1081	LAG Interconnector (LAG)	PP ceased to exist, so the project does not comply with mandatory criteria of company existence.
Storage	1015	Cruachan 2	Project is located in Great Britain and therefore does not meet eligibility criteria from section 2.1 of the Inclusion Guidelines, according to which storage projects must be planned to be developed in a country represented within ENTSO-E. ²⁰
	1019	Hydro-pumped electricity storage Gironés & Raïmats	Project did not prove compliance with any of the additional administrative criteria e) to j) from the Inclusion Guidelines.
	1042	Distributed network of Hydrogen storage and production by electrolysis with re-electrification through a fleet of FCEVs	Project did not prove compliance with any of the additional administrative criteria e) to j) from the Inclusion Guidelines.

²⁰ As of January 2022, the TSOs located in Great-Britain are no longer member of ENTSO-E.

5. SHORTCOMINGS OR PRACTICAL MISTAKES REGARDING PROJECTS IN THE DRAFT EU TYNDP 2022

5.1. Investment numbers

- (47) Based on the information provided by NRAs, the Agency notes that at least four transmission investments from the EU TYNDP 2020 appear under new investment numbers in the draft EU TYNDP 2022. These investments are clustered differently in the draft EU TYNDP 2022 and they are listed in Table 6.

Table 6: Investment numbers changed in the draft EU TYNDP 2022

Project number in the EU TYNDP 2020	Investment number in the EU TYNDP 2020	Investment name in the EU TYNDP 2020	Comment by the NRA
124	733	Ekhyddan-Nybro-Hemsjo	The Swedish NRA explains that in draft EU TYNDP 2022, this investment corresponds to investments 1783 ('Nybro-Hemsjo') and 1784 ('Ekhyddan-Nybro').
170	1004	330kV OHL Paide-Sindi (L346)	The Estonian NRA explains investment was moved under project 1094 ('Estlink 3') in the draft EU TYNDP 2022. As new substation 330 kV Sopi is constructed on the line, new investments in the draft EU TYNDP 2022 are investments 1769 ('Estonian grid reinforcements: L346 Paide-Sopi 330 kV OHL reconstruction') and 1770 ('L347 Sopi-Sindi 330 kV OHL reconstruction').
1042	1694	New 330 kV OHL Darbenai-Musa	The Lithuanian NRA explains the investment code in the draft EU TYNDP 2022 is 1788 ('New 330 kV OHL Darbenai-Musa').
	1695	New 330 kV OHL Panevezys-Musa	The Lithuanian NRA explains the investment code in the draft EU TYNDP 2022 is 1789 ('New 330 kV OHL Panevezys-Musa').

- (48) Furthermore, the Agency identified five instances where the same project number was assigned to two different projects. These projects are listed in Table 7.

Table 7: Projects in the draft EU TYNDP 2022 with the same project numbers

Number	Projects with the same number	
1012	330 kV OHL Tartu-Balti (L300)	Purifying-Pumped Hydroelectric Energy Storage ('P-PHES Navaleo')
1013	Viru-Tsirculiina 330kV OHL	CAES Zuidwending, NL
1035	Baczyna	Ptolemaida Battery Energy Storage System
1050	Van Eyck - Gramme: HTLS upgrade	SE Integrator
1041	Rem. lim. in Central Italy	Purifying-Pumped Hydroelectric Energy Storage 'Velilla del Río Carrión' ('P-PHES Velilla')

- (49) The Agency is of the view that applying non-unique project identification numbers (even if one of them is a transmission and the other one is a storage project) or not consistently applying the investment codes across the EU TYNDPs, negatively impacts the EU TYNDP transparency and adds substantial complexities to the EU TYNDP-related

processes (e.g. monitoring, project consistency assessment, project data comparison for specific purposes).

5.2. Investment costs

(50) According to the 3rd ENTSO-E Guideline for Cost Benefit Analysis of Grid Development Projects ('CBA 3.0 Guideline')²¹:

- for mature investments, the costs should be reported together with a clearly explained uncertainty range, while for non-mature investments, this principle should be applied in case detailed project cost information is available,
- in the absence of the availability of the detailed project cost information, for investments 'planned but not yet in permitting' or 'under consideration', a set of standard investment costs with a project-specific complexity factor needs to be used,
- regarding the reported CAPEX²², it should be comprised of two parts: 'inception CAPEX', indicator C1a, which is '*the capital costs incurred at the inception of the project*', and 'sustaining CAPEX', indicator C1b, which is the '*capital expenditure incurred during the assessment period that is necessary to ensure that the functionality of the original assets realised by the inception CAPEX is maintained*'. Currently, overall numbers are provided for the CAPEX, but given that the two categories of costs are incurred at different points in time, affecting the overall cost estimate of the project, they should be reported as distinct figures.

(51) The Agency notes contrary to the requirements of the Inclusion Guidelines, for nine transmission investments in the draft EU TYNDP 2022, information on the capital expenditures (CAPEX) and/or the operating expenses (OPEX) is missing (e.g. provided as zero). Moreover, the Agency notes that 7 more mature (i.e. of status 'in permitting' or 'under construction') transmission investments and three storage projects lack information on the cost uncertainty range. The list of these investments and storage projects is provided in Table 16 in Annex I.

(52) The Agency notes that the draft EU TYNDP 2022 provides no information indicating for which projects or investments the standard costs were actually used.

²¹ CBA 3.0 Guideline, p. 93-96

²² CBA 3.0 Guideline, p. 110-112

5.3. Clustering of investments

- (53) The Agency welcomes an increased completeness of information regarding the necessity for clustering of projects in comparison to its completeness in the EU TYNDP 2020²³. However, six projects with more than one investment in the draft EU TYNDP 2022 remain without an explanation for the necessity of clustering. These projects are listed in Table 17 in Annex I.
- (54) According to the CBA 3.0 Guideline²⁴ and Implementation Guidelines for TYNDP 2022 based on 3rd ENTSO-E guideline for CBA of grid development projects ('Implementation Guidelines')²⁵, investments clustered within the same project can at most be one project status level apart from each other.
- (55) The Agency notes that project 170 '*Baltic States Synchronization with Continental Europe*' in the draft EU TYNDP 2022 contains (not-yet commissioned) investments that are more than one project status level apart from each other, i.e. its least mature investment is 'under consideration' and its most mature (not-yet commissioned) investment is 'under construction'.
- (56) The Agency recalls that the clustering of investments should be carried out in line with the CBA 3.0 Guideline and the Implementation Guidelines.
- (57) The Agency notes that for six project in the draft EU TYNDP 2022, project's status does not correspond to the status of their least mature investment. These projects are listed in Table 18 in Annex I. In the Agency's view, status of the project should be consistent to the status of its least mature investment.

5.4. Information on the progress of investments

- (58) The Agency welcomes that the expected commissioning date for each investment also includes the month, not only the year, which makes these data more informative and increases consistency with several related activities of the Agency.
- (59) The Agency identified inconsistencies in the information regarding the progress of the investments since 2020. There are 66 new investment numbers in the draft EU TYNDP 2022 and out of them, 17 investments are not labelled as 'new', thus either the investment number has changed for a previously included investment (e.g. as it is the case for

²³ The Agency's Opinion No 04/2021, p.12

²⁴ CBA 3.0 Guideline, p. 20

²⁵ <https://eepublicdownloads.blob.core.windows.net/public-cdn-container/tyndp-documents/TYNDP2022/ACER-opinion/CBA-IG.pdf>

investment 1783 and 1784)²⁶ or the progress data is incorrect and should be ‘new investment’. These investments are listed in Table 19 in Annex I.

- (60) Furthermore, 30 transmission investments²⁷ are labelled both in the TYNDP 2020 and in the draft TYNDP 2022 as ‘new investment’.
- (61) In at least 30 instances, the commissioning year of the investment does not match the progress of the investment when comparing information provided in the TYNDP 2020 and draft TYNDP 2022. 24 investments are labelled as ‘on time’, but appear to be delayed, while six investments appear to be ‘ahead of time’ when comparing the commissioning years from the TYNDP 2020 with the information in the draft TYNDP 2022. These investments are listed in Table 20 in Annex I.

5.5. Additional shortcomings or practical mistakes regarding projects of the draft EU TYNDP 2022

- (62) The Agency’s review of the projects in the draft EU TYNDP 2022 identified some investments for which the draft TYNDP 2022 did not provide the correct list of hosting countries:
- Projects 123 (*‘LitPol Link Stage 2’*) and 138 (*“Black Sea Corridor”*) are reported as internal projects, although they appear to be located on the territory of more than one country.
 - Project 346 (*‘ZuidWest380 NL Oost’*) is an internal project in the Netherlands, however, Belgium is also reported under this project in the draft EU TYNDP 2022.
- (63) Finally, for some investments (listed in Table 21 in Annex I) the draft TYNDP 2022 fails to provide sufficiently concrete investment description. The Agency is of the view that for the sake of transparency and robustness of the EU TYNDP, a sufficient description of each investment in the EU TYNDP should be provided.

HAS ADOPTED THIS OPINION:

1. The Agency finds that the draft EU TYNDP 2022 assessments and the projects included in it generally contribute to the objectives of non-discrimination and effective competition, referred to in Article 32(2) of Regulation No 2019/943.

²⁶ For more information, see section 5.1.

²⁷ Investment numbers 1661, 1662, 1663, 1664, 1665, 1702, 1703, 1704, 1498, 1499, 1521, 1642, 1646, 1652, 1653, 1622, 1623, 1555, 1677, 1688, 1689, 1697, 1706, 1707, 1708, 1727, 1736, 1740, 1741, 1750

2. However, as pointed out in its Opinion 03/2023, the Agency considers that the draft TYNDP 2022 does not sufficiently contribute to the efficient functioning of the market and secure functioning of the internal electricity market due to a number of shortcomings and addresses a number of recommendations to ENTSO-E, as regards the finalisation and adoption of the TYNDP 2022.
3. Further, in line with Article 48(2) of Regulation (EU) 2019/943 the Agency identified a number of inconsistencies between an NDP and the draft EU TYNDP 2022 as provided in the recitals of this Opinion. It is recommended that ENTSO-E further enhances the consistency between the NDPs and the EU TYNDP by implementing the following measures:
 - a. ENTSO-E should further increase its efforts to include all planned projects with cross-zonal relevance from the NDPs in the EU TYNDP.
 - b. ENTSO-E should ensure that each investment included in the EU TYNDP and not included in the NDP of a hosting Member State is clearly flagged in the EU TYNDP and the reason for such absence should also be provided.
 - c. All the commissioned and cancelled investments included in a previous EU TYNDP should enter the subsequent EU TYNDP for monitoring purposes (i.e. without a CBA) and each EU TYNDP should provide a list of investments which are no longer included in the EU TYNDP compared to the previous edition, together with an explanation for their non-inclusion.
 - d. ENTSO-E should ensure that the information on investments' status and commissioning date are sufficiently credible. Overly optimistic projections of the expected commissioning dates should be avoided. ENTSO-E should define certain reference project timelines (e.g. number of years for permitting and construction periods). For projects whose status is 'under consideration' or 'planned but not yet in permitting', future EU TYNDPs should provide the project promoter's estimate together with the estimation of ENTSO-E based on the reference timeline. In case of differences, the project promoters should provide an explanation.
 - e. ENTSO-E should ensure that all investments and projects in the EU TYNDP 2022 respect the criteria for clustering laid down in the CBA 3.0 Guideline and in the Implementation Guidelines. ENTSO-E should revise the clustering and demonstrate the necessity for clustering with regard to the draft EU TYNDP 2022 projects identified in section 5.3 of this Opinion.
 - f. The Agency invites ENTSO-E to improve the costs-related information in the EU TYNDP by:
 - i. including information on CAPEX and OPEX for all transmission investments and storage projects,
 - ii. including the cost uncertainty ranges at least for all projects whose status is 'in permitting' or 'under construction',

- iii. reporting inception CAPEX (i.e. the capital costs incurred at the inception of the project) and sustaining CAPEX (i.e. capital expenditure incurred during the assessment period that is necessary to ensure that the functionality of the original assets realised by the inception CAPEX is maintained) separately,
 - iv. including information on how the costs were determined for each transmission investment or storage project (i.e. by using standard costs or detailed cost information and how the cost data was derived).
 - g. ENTSO-E should consider the differences between the NDPs and the draft EU TYNDP 2022 identified by NRAs and update the draft EU TYNDP 2022 by taking into account the information and comments provided by NRAs in Table 10 in Annex I, as appropriate. ENTSO-E should also review and eliminate the project-specific inconsistencies in the draft EU TYNDP 2022 reported in section 5 of this Opinion.
 - h. ENTSO-E should improve transparency and robustness of the EU TYNDP by ensuring that a sufficient level of technical information is provided for each investment, including those investments in the draft EU TYNDP 2022 which are listed in Table 21 of this Opinion.
 - i. ENTSO-E should apply a unique coding for investments and projects in the EU TYNDP.
 - j. ENTSO-E should, for the purpose of consistency with the previous EU TYNDP, review the information in the draft EU TYNDP 2022 regarding the investment progress since the EU TYNDP 2020 and adjust it where necessary.
4. In order to increase the robustness, credibility and transparency of the NDPs, the Agency recommends that the parties responsible for their development, review and adoption take into account the following measures and pursue their implementation to the extent it is in their powers:
- a. The NDPs' scope should be expanded to allow the inclusion of third-party projects, where this is not yet the case.
 - b. Cross-zonal relevant projects in the NDPs should be flagged explicitly.
 - c. The differences between the NDPs and the draft EU TYNDP 2022 identified by NRAs should be considered and the NDPs should be updated by taking into account the information and comments provided by NRAs in Table 10, as appropriate.
 - d. In case of interconnection investments, where the national parts are in different advancement status across the borders, the relevant parties should jointly review the concerned interconnection investments and, in case of inconsistencies, amend the respective planning and implementation plans.

This Opinion is addressed to ENTSO-E, NRAs, TSOs and other project promoters with cross-zonal relevant projects.

Done at Ljubljana, on 4 April 2023.

- SIGNED -

For the Agency
The Director
C. ZINGLERSEN

Annexes: Annex I

ANNEX I

Table 8: Participating countries and the numbers of the reviewed investments and storage projects

Country	Number of relevant national parts of transmission investments and storage projects	Share of reviewed national parts of transmission investments and storage projects [%]
Austria	16	100
Belgium	19	100
Bulgaria	9	100
Croatia	5	100
Cyprus	3	100
Czech Republic	5	100
Denmark	12	100
Estonia	21	100
Finland	11	100
France	20	100
Germany	43	100
Greece	17	100
Hungary	2	100
Ireland	8	100
Italy	27	100
Latvia	12	100
Lithuania	17	100
Luxembourg	4	100
Malta	1	100
the Netherlands	17	100
Norway	1	100
Poland	11	100
Portugal	8	100
Romania	17	100
Slovakia	4	100
Slovenia	4	100
Spain	21	100
Sweden	13	100
Total	348	100

Table 9: Investment numbers of national parts of investments which were not able to be assessed on any aspect

	Investment numbers of national parts of investments which were not able to be assessed by the NRA
Investment numbers	403 (SE), 462 (IE), 604 (BE), 616 (SI), 635 (IT), 645 (IT), 650 (BE, DE, LU), 810 (IE), 1014 (IT), 1107 (BE), 1241 (FI), 1255 (NL), 1262 (SE), 1269 (HR), 1378 (IT), 1380 (AT, IT), 1382 (NO), 1384 (IT), 1385 (IE), 1430 (IT), 1431 (GR), 1432 (GR), 1433 (GR), 1434 (GR), 1458 (IT), 1478 (IT), 1482 (IT), 1483 (AT), 1483 (SI), 1493 (DE), 1504 (DE, NL), 1506 (NL), 1507 (NL), 1508 (DE), 1509 (DE), 1511 (DE), 1521 (IT), 1555 (IT), 1557 (IT), 1559 (GR), 1628 (NL), 1638 (IE), 1642 (IE), 1653 (IE), 1675 (SE), 1682 (GR), 1691 (NL), 1704 (GR), 1706 (BE), 1707 (DE), 1708 (DK), 1709 (GR), 1726 (DE), 1727 (IT), 1740 (LV, SE), 1741 (SE), 1750 (IE), 1751 (IT), 1755 (LV), 1756 (LV), 1757 (LV), 1758 (LV), 1759 (DK), 1760 (FI), 1761 (LV), 1762 (FI, SE), 1764 (SE), 1766 (DE), 1785 (FI), 1791 (BE), 1794 (DE), 1795 (IT), 1796 (IT), 1797 (IT), 1798 (IT), 1799 (GR, IT), 1804 (AT), 1805 (AT), 1806 (AT), 1815 (NL), 1816 (DE), 1817 (NL), 1818 (DE), 1819 (DE, NL)

Table 10: List of identified inconsistencies between the data in the draft EU TYND 2022 and the respective NDPs or the information available to the NRA

	Country of NRA	Inv. number	Investment name	Information provided by the NRA
Technical features	Belgium	1625	AC-part of Belgian Modular Offshore Grid II (MOG II)	Capacity 2.1 GW
	Italy	86	New 66km double circuit 400kV OHL between existing Foggia and Villanova 400kV substations, also connected in and out to the Larino and Gissi substations	The Villanova - Gissi part is commissioned, therefore the investment item should be Gissi-Larino-Foggia.
		616	Salgareda - Bericevo	A reference (but not an investment item) to PST and other upgrades is included in the draft EU TYNDP 2022 project sheets, however, such item was not placed 'under consultation' by the NRA.
		1798	New 400 kV submarine cable Bolano-Paradiso	The investment has a different location, i.e. Bolano – Annunziata.
Clustering	Belgium	1519	Avelgem-Courcelles	Investment is separated in three different projects in the NDP (2 substations and 1 line).
	Italy	86	New 66km double circuit 400kV OHL between existing Foggia and Villanova 400kV substations, also connected in and out to the Larino and Gissi substations	The investment should not be clustered together with Deliceto-Bisaccia which is commissioned.
		616	Salgareda-Bericevo	Project 150 'Italy-Slovenia' should be composed of two items, short-term upgrades and a potential future HVDC link. The transfer capacity for the short-term investment item is indicated in the project sheet at around 400 MW. This NTC increase should be more transparently presented in the final TYNDP 2022.
		645	OHL between the Laino and Altomonte in Calabria	In the NDP, the investment is not clustered together with investment 1727.
		1557	Tyrrhenian HVDC link - West	The investment should not be clustered together with investment 1795.
		1795	Tyrrhenian HVDC link - East	The investment should not be clustered together with investment 1557.
		1796	New 400 kV overhead line between Aliano and Montecorvino	The investment should not be clustered together with investment 1797.
		1797	New 400 kV overhead line in the northern area of Benevento	The investment should not be clustered together with investment 1796.
	Poland	1232	Baczyna-Plewiska	Investment is separated in two different projects in the NDP: "Construction of 400 kV Baczyna-Plewiska line" (CAPEX app. million EUR) and "Expansion of

	Country of NRA	Inv. number	Investment name	Information provided by the NRA
				400/220/110 kV Plewiska substation” (CAPEX app. 20 million EUR), however the later includes also other, additional works not related to the construction of Baczyna–Plewiska.
		1661	Construction of new 400kV line Dunowo-Zydowo Kierzkowo	Investments 1661 and 1662 are separated in three different projects in the NDP: “Construction of 400 kV Dunowo-Żydowo Kierzkowo-Pila Krzewina line” (CAPEX app. 200 million EUR), “Expansion of 400 kV and 110 kV switchgear at 400/220/110 kV Dunowo substation together with installation of 400/110 kV transformers” (CAPEX ca. 35 million EUR) and “Expansion and upgrade of the Pila Krzewina substation” (CAPEX app. 28 million EUR)
		1662	Construction of new 400kV line Pila Krzewina-Zydowo Kierzkowo	Investments 1661 and 1662 are separated in three different projects in the NDP: “Construction of 400 kV Dunowo-Żydowo Kierzkowo-Pila Krzewina line” (CAPEX app. 200 million EUR), “Expansion of 400 kV and 110 kV switchgear at 400/220/110 kV Dunowo substation together with installation of 400/110 kV transformers” (CAPEX ca. 35 million EUR) and “Expansion and upgrade of the Pila Krzewina substation” (CAPEX app. 28 million EUR)
		1663	Modernization of 400kV OHL Krajnik-Morzyczyn	Investments 1663 and 1664 are separated in three different projects in the NDP: “Upgrade of 400 kV Krajnik-Morzyczyn, Morzyczyn-Dunowo and Krajnik-Baczyna lines on the section using the existing 400 kV Krajnik-Plewiska line” (this investment includes also modernization of other line which is out of the scope of TYNDP 2022 investments), “Upgrade of 400 kV Słupsk-Żarnowiec line together with construction of a section of the 400 kV line from Choczewo to Słupsk-Żarnowiec line tap” and “Upgrade of 400 kV Dunowo-Słupsk line”.
		1664	Modernization of 400kV OHL Morzyczyn-Dunowo-Słupsk-Żarnowiec	Investments 1663 and 1664 are separated in three different projects in the NDP: “Upgrade of 400 kV Krajnik-Morzyczyn, Morzyczyn-Dunowo and Krajnik-Baczyna lines on the section using the existing 400 kV Krajnik-Plewiska line” (this investment includes also modernization of other line which is out of the scope of TYNDP 2022 investments), “Upgrade of 400 kV Słupsk-Żarnowiec line together with construction of a section of the 400 kV line from Choczewo to Słupsk-Żarnowiec line tap” and “Upgrade of 400 kV Dunowo-Słupsk line”.
Commi	Belgium	1519	Avelgem-Courcelles	Expected commissioning year for the 2 substations is 2027 while the expected year for the project lines is 2029-2030. The draft EU TYNDP reports December 2028.

	Country of NRA	Inv. number	Investment name	Information provided by the NRA
		1759	Connection between Belgium and the Danish Energy Island	The investment is expected to be commissioned between 2031 and 2032, while the draft EU TYNDP reports December 2030.
	Germany	1772	Roost - Flebour - Bauler	The TSO envisioned the investment to be commissioned in 2030, while the draft EU TYNDP reports December 2027.
	Greece	256	256	In the NDP (2023-2032), the commissioning date is June 2023 while the draft EU TYNDP reports June 2022.
		1738	New AC 400 kV interconnection line Greece - Turkey	In the NDP (2023-2032), the commissioning date is December 2029, while the draft EU TYNDP reports June 2035.
	Italy	86	New 66km double circuit 400kV OHL between existing Foggia and Villanova 400kV substations, also connected in and out to the Larino and Gissi substations	The commissioning date is 2028, while the draft EU TYNDP reports December 2027.
		90	90	This investment is expected by 2025, while the draft EU TYNDP 2022 reports December 2023.
		616	Salgareda - Bericevo	The investment is 'under consideration' (as provided in the draft EU TYNDP 2022) and for this reason, it does currently not have the commissioning date defined. The draft EU TYNDP 2022 reports the commissioning date December 2040.
		635	Elmed Project	The investment is expected to be commissioned in 2028, while the draft EU TYNDP 2022 reports December 2027.
		645	OHL between the Laino and Altomonte in Calabria	The investment is expected to be commissioned in 2029, while the draft EU TYNDP 2022 reports December 2027.
		1041	Rem. lim. in Central Italy	This investment is expected to be commissioned by 2023, while the draft EU TYNDP 2022 reports December 2026.
		1053	Second HVDC Module IT-ME	This investment is 'under consideration' according to the NRA's opinion 335/2022 on the draft NDP 2021 and for this reason, it does currently not have a commissioning date. The draft EU TYNDP 2022 reports December 2026.
		1458	SACOI3	This investment is expected to be commissioned in 2027, while the draft EU TYNDP 2022 reports December 2026.
		1555	Lienz (AT) - Veneto region (IT)	The expected commissioning date is 2035, while the draft EU TYNDP reports December 2030.
		1796	New 400 kV overhead line between Aliano and Montecorvino	The expected commissioning date is 2032, while the draft EU TYNDP reports December 2030.
		1797	New 400 kV overhead line in the northern area of Benevento	The expected commissioning date is 2035, while the draft EU TYNDP reports December 2030.

	Country of NRA	Inv. number	Investment name	Information provided by the NRA
		1799	GRITA 2	The expected commissioning date is 2031, while the draft EU TYNDP reports December 2030.
	Luxembourg	1630	AC Overhead Line Aach-Bofferdange	In the NDP 2021, the commissioning date is 2027, while the draft EU TYNDP 2022 reports December 2026.
	Poland	1035	Baczyna	In the NDP, the expected commissioning date is 2025, while the draft EU TYNDP 2022 reports December 2024.
		1663	Modernization of 400kV OHL Krajnik-Morzyczyn	In the NDP, the expected commissioning date is 2026 and the draft EU TYNDP reports July 2023.
		1664	Modernization of 400kV OHL Morzyczyn-Dunowo-Slupsk-Zarnowiec	In the NDP, the expected commissioning date is 2026 and the draft EU TYNDP reports December 2023.
		1665	Modernization of 400kV OHL Zarnowiec-Gdansk/Gdansk Przyjazn-Gdansk Blonia	In the NDP, the expected commissioning date is 2025 and the draft EU TYNDP 2022 reports December 2023.
	Austria	886	886 – east of Austria	The investment was commissioned in Q3 of 2022, but the reported status in the draft EU TYNDP 2022 is ‘under construction’.
	Belgium	445	BRABO II: Zandvliet - Lillo - Liefkenshoek	This investment is commissioned. Status in the draft EU TYNDP 2022 is “under construction” and commissioning date 2021.
		605	BRABO II: Lillo 380	This investment is commissioned. Status in the draft EU TYNDP 2022 is ‘under construction’ and commissioning date 2020.
	Finland	1710	Viitajärvi-Pyhänselkä	The investment is ‘under construction’ and the draft EU TYNDP 2022 reports ‘in permitting’.
Status	Ireland	1638	Mares Cable: Irish Sea Interconnector Cable	The investment is still ‘under consideration’ and the draft EU TYNDP 2022 reports ‘planned, but not yet in permitting’. The investment is not at an enough advanced stage and has not yet been approved.
		1642	MaresConnect Converter Station Ireland	The investment is still ‘under consideration’ and the draft EU TYNDP 2022 reports ‘planned, but not yet in permitting’. The investment is not at an enough advanced stage and has not yet been approved.
		1653	Enabling Works 2: EIRGRID 1 x 245kV Connection bay at Maynooth and associated works	The investment is still ‘under consideration’ and the draft EU TYNDP 2022 reports ‘planned, but not yet in permitting’. The investment is not at an enough advanced stage and has not yet been approved.
	Italy	1503	Second HVDC Module IT-ME	This investment was deemed ‘under consideration’ in the NRA’s opinion 355/2022 on the draft NDP 2021. It is not expected before 2030, unless a future decision will be taken to proceed with the project. Investment’s status in the draft EU TYNDP 2022 is ‘under construction’.
	Lithuania	1566	Reconstructions in North Eastern Lithuania	This investment is commissioned. Status in the draft EU TYNDP 2022 is ‘under construction’ and commissioning date 2021.

	Country of NRA	Inv. number	Investment name	Information provided by the NRA
Progress (and the reason)		1568	Upgrades in Alytus substation (LT)	This investment is commissioned. Status in the draft EU TYNDP 2022 is 'under construction' and commissioning date 2021.
		1778	Offshore Wind LT 2	The investment is already 'planned but not yet in permitting' and the draft EU TYNDP 2022 reports 'under consideration'.
		1788	New 330 kV OHL Darbenai-Musa	The investment is already 'planned but not yet in permitting' and the draft EU TYNDP 2022 reports 'under consideration'.
		1789	New 330 kV OHL Panevezys-Musa	The investment is already 'planned but not yet in permitting' and the draft EU TYNDP 2022 reports 'under consideration'.
	Italy	86	New 66km double circuit 400kV OHL between existing Foggia and Villanova 400kV substations, also connected in and out to the Larino and Gissi substations	The investment is delayed and not 'on time' as reported in the draft EU TYNDP 2022.
		90	90	The investment is delayed due to post-permitting implementation measures, while the draft EU TYNDP 2022 reports the investment is 'on time'.
		645	OHL between the Laino and Altomonte in Calabria	The investment is delayed due to permitting reasons. The draft EU TYNDP 2022 reports the investment to be rescheduled.
		1041	Rem. lim. in Central Italy	Progress is 'ahead of schedule' and not 'on time' as reported in the draft EU TYNDP 2022.
		1458	SACOI3	The project is delayed due to permitting reasons in the Corse island, while the draft EU TYNDP 2022 reports the investment is 'on time'.
		1503	Second HVDC Module IT-ME	This investment is rescheduled due to an unclear need of the project. The draft EU TYNDP 2022 reports the investment is 'on time'.
Costs	Austria	1583	Vorarlberg	CAPEX for this investment seems unrealistic and highly inflated. Possible grid enforcement in this area is mentioned as System-need-study in the Austrian NDP only.
	Croatia	1535	New Substation 400/110 kV Lika	In the NDP, the reported costs are 31 million EUR. The draft EU TYNDP 2022 reports CAPEX 11.9 million EUR.
	France	810	France Ireland Interconnector	According to the decision by the NRA of 3 November 2022, 1623 million EUR are the costs including 141 million EUR for contingencies. The significant increase is mainly by tensions in the supply market. The draft EU TYNDP 2022 provides CAPEX 1000 million EUR +- 10%.

	Country of NRA	Inv. number	Investment name	Information provided by the NRA
	Italy	86	New 66km double circuit 400kV OHL between existing Foggia and Villanova 400kV substations, also connected in and out to the Larino and Gissi substations	CAPEX for the missing part is above 200 million EUR and not 415 million EUR, as reported in the draft EU TYNDP 2022.
		96	New 30km single circuit 400kV OHL between the future substations of Deliceto and Bisaccia, in the Candela area	The actual CAPEX of this investment is around 37 million EUR. The CAPEX of 201 million EUR reported in the draft EU TYNDP 2022 refers to a bundle of interdependent projects.
		1041	Rem. lim. in Central Italy	The CAPEX provided in the draft EU TYNDP 2022 appears to include some interdependent works on the 132 kV grid.
		1458	SACOI3	The CAPEX is around 1100 million EUR, while the draft EU TYNDP 2022 reports 930 million EUR.
		1521	New HVDC line between Villanova and Fano existing 400 kV substations	The CAPEX is around 1300 million EUR, while the draft EU TYNDP 2022 reports 105 million EUR.
		1798	New 400 kV submarine cable Bolano-Paradiso	The CAPEX is around 175 million EUR, while the draft EU TYNDP 2022 reports 1124 million EUR. The expected OPEX is around 3.5 million EUR/year.
	Lithuania	382	New 330 kV OHL Vilnius-Neris	In the NDP, the reported costs are 50.48 million EUR. The draft EU TYNDP 2022 reports CAPEX 24.76 million EUR.
		1034	New HVDC interconnector "Harmony Link"	In the NDP, the reported costs are 499.87 million EUR. The draft EU TYNDP 2022 reports CAPEX 682.6 million EUR.
		1565	Reconstruction of 330 kV OHL LE-Vilnius	In the NDP, the reported costs are 11.56 million EUR. The draft EU TYNDP 2022 reports CAPEX 18.281 million EUR.
		1568	Upgrades in Alytus substation (LT)	In the NDP, the reported costs are 9.76 million EUR. The draft EU TYNDP 2022 reports CAPEX 22.438 million EUR.
		1632	New 330 kV Musa substation	In the NDP, the reported costs are 15.6 million EUR. The draft EU TYNDP 2022 reports CAPEX 6.14 million EUR.
		1634	New 330 kV OHL Bitenai - KHAE	In the NDP, the reported costs are 43.04 million EUR. The draft EU TYNDP 2022 reports CAPEX 42.06 million EUR.
		1659	New 330 kV OHL Darbenai-Bitenai	In the NDP, the reported costs are 60 million EUR. The draft EU TYNDP 2022 reports CAPEX 62.77 million EUR.
		1788	New 330 kV OHL Darbenai-Musa	In the NDP, the reported costs are 110 million EUR. The draft EU TYNDP 2022 reports CAPEX 66 million EUR.
		1789	New 330 kV OHL Panevezys-Musa	In the NDP, the reported costs are 50 million EUR. The draft EU TYNDP 2022 reports CAPEX 21.6 million EUR.

	Country of NRA	Inv. number	Investment name	Information provided by the NRA
	Luxembourg	1629	Substation Bofferdange	In the NDP, the reported costs are 33 million EUR. The draft EU TYNDP 2022 reports CAPEX 44 million EUR.
	Poland	373	Ostroleka-Stanislawow	In the NDP, the reported costs are 55 million EUR. The draft EU TYNDP 2022 reports CAPEX 67.74 million EUR. ²⁸
Transfer capacity	Austria	997	997 Pleinting - St. Peter	Transfer capacity increase of investments 997, 1472 and 1473 is dependent from each other and not cumulative. This is important for market simulation. The preparation of the TYNDP data does not provide the possibility to check the correct usage in the simulation.
		1472	St. Peter (AT) - Tauern (AT)	Transfer capacity increase of investments 997, 1472 and 1473 is dependent from each other and not cumulative. This is important for market simulation. The preparation of the TYNDP data does not provide the possibility to check the correct usage in the simulation.
		1473	Isar/Altheim/Ottenhofen - St. Peter	Transfer capacity increase of investments 997, 1472 and 1473 is dependent from each other and not cumulative. This is important for market simulation. The preparation of the TYNDP data does not provide the possibility to check the correct usage in the simulation.
Benefits	Italy	All Italy-related clusters in the draft EU TYNDP 2022		The Italian NRA disagrees with the benefit's calculation for all Italy-related clusters in the draft EU TYNDP 2022 due to unrealistic scenario assumptions.
Other	Greece	1431	Lavrio - Levitha	The Greek NRA objects to the inclusion of project 293 ('Southern Aegean Interconnector (SAI)') in the EU TYNDP 2022. In its decision 287/2022, the NRA approved the NDP and the interconnection of mainland Greece to Dodecanese which has a similar route as SAI. This decision was based on extensive studies carried out by a dedicated committee established by law in order to recommend the most efficient and economic way for the interconnection of Greek islands in the Aegean Sea. Consequently, the NRA considers project SAI as redundant.
		1432	Levitha - Crete	
		1433	Levitha - Syrna	
		1434	Kinaros - Levitha	
		1704	Levitha - Kos	

²⁸ The Polish NRA explains one of the factors affecting the difference is the different PLN-EUR exchange rate used at different points in time.

	Country of NRA	Inv. number	Investment name	Information provided by the NRA
		1709	Greece Africa Power Interconnector	The Greek NRA objects to the inclusion of project 1048 (' <i>Africa Power Interconnector (GAP)</i> ') in the EU TYNDP 2022, because this project is complementary to SAI project for which the NRA also raised objections. Furthermore, there are serious doubts that the weak electrical system of Crete (Greek island) is able to accommodate a second converter station (Euroasia project is the first). Moreover, the NRA fully supports project 1041 (' <i>GREGY Green Energy Interconnector</i> ') as the only interconnection project between Greece and Egypt recommended by the NRA.

Table 11: List of transmission investment in the draft EU TYNDP 2022 that are not present in the respective NDPs

Reason for the absence	Country	Project number	Investment number	Investment name
The commissioning date of the investment is beyond the time span of the NDP.	Croatia	243	1269	New 400 kV overhead line Sombor (RS) - Ernestinovo (HR)
	Czech Republic	330	1498	New CZ-SK 400 kV interconnector
	Finland ²⁹	239	1241	Fenno-Skan 1 renewal
		1094	1760	Estlink 3
			1785	Inkoo-Hikiä
	Slovenia	1095	1762	4th AC Finland-Sweden north
		325	1483	Upgrade Obersielach (AT) - Podlog (SI)
		150	616	Salgareda – Bericevo
	the Netherlands ³⁰	335	1504	Danish Hub
			1506	Interconnection NL Maasvlakte to Dutch hub (#1)
			1507	Interconnection NL Maasvlakte to Dutch hub (#2)
			1815	Dutch Hub
			1817	Interconnection Danish hub to Dutch hub
			1819	Interconnection Dutch hub to German hub
The investment appertains to a non-TSO project or a storage project and non-		1047	1691	Emden-Eemshaven
	Belgium ³¹	1049	1706	Converter Stations & Subsea Cabling
	Denmark	1051	1708	Converter stations and Subsea cables
	Norway	190	1382	NorthConnect
	France	299	1458	SACOI3
	Slovenia	323	1478	Dekani (SI) - Zaule (IT) interconnection

²⁹ The Finnish NRA explains the TSO will do an updated NDP in 2023 and the NRA will monitor that these projects will be introduced in the NDP accordingly.

³⁰ The Dutch NRA assumes it will be part of the NDP 2024

³¹ The Belgian NRA explains The TSO received a request for a scoping study from the project promoters. This study is still ongoing.

Reason for the absence	Country	Project number	Investment number	Investment name
TSO or storage projects are normally not included or present NDP.		324	1482	Redipuglia (IT) - Vrtojba (SI) Interconnection
	Sweden ³²	1068	1740	LaSGo Link - Gotland to Latvia
			1741	LaSGo Link - Sweden to Gotland
	the Netherlands	309	1628	NeuConnect Interconnector
The investment has been commissioned.	Belgium	297	445	BRABO II: Zandvliet - Lillo – Liefkenshoek
			605	BRABO II: Lillo 380
	Bulgaria	142	256 ³³	256
			257	257
			258	258
			262	262
		138	800	400 kV OHL Varna-Burgas
	Lithuania	170	1565	Reconstruction of 330 kV OHL LE-Vilnius
			1566	Reconstructions in North Eastern Lithuania
			1568	Upgrades in Alytus substation (LT)
The investment is not advanced enough to be included in the NDP (e.g. study has not turned into a project yet).	Ireland	1082	1750	Sea-Socket
		349	1638	Mares Cable : Irish Sea Interconnector Cable
			1642	MaresConnect Converter Station Ireland
			1653	Enabling Works 2: EIRGRID 1 x 245kV Connection bay at Maynooth and associated works
	Latvia ³⁴	1068	1740	LaSGo Link - Gotland to Latvia
		1088	1755	The interconnector between Latvia and Estonia with Off-shore wind connection hub in between
			1756	Cross-border network reinforcement Grobina (LV) - Derbenai (LT)
			1757	Cross-border network reinforcement Broceni (LV) - Telsiai (LT)
			1758	Internal network reinforcement Ventspils (LV) - Broceni (LV)
			1761	Off-shore substation for off-shore wind park connection
	Sweden	1095	1762	4th AC Finland-Sweden north
		267	1262	Hansa PowerBridge II
The investment is not included, because the latest		1119	1804	Bisamberg (AT) - Wien SO (AT) - Parndorf (AT)
		1121	1805	Hessenberg (AT) - Weißenbach (AT)

³² The Swedish NRA explains the TSO has previously denied connection, pending project promoter's next step.

³³ The Bulgarian NRA explains the investment has fully been constructed on the Bulgarian side.

³⁴ The Latvian NRA explains preliminary studies going on and the amount and location of the investments will be determined by studies.

Reason for the absence	Country	Project number	Investment number	Investment name
NDP was elaborated earlier than the draft TYNDP.	Austria ³⁵	1120	1806	Wien SO (AT) – Ternitz (AT) – Hessenberg (AT)
	France ³⁶	1122	1810	HVDC converter stations and cables
		1123	1811	Offshore Wind Connection Centre Manche 2
		1124	1812	Offshore Wind Connection South Brittany
		1127	1813	Offshore wind connection South Atlantic
		276	1206	HVDC Pamplona area - Cantegrit
			1207	Upgrade Cantegrit-Saucats
			1208	Upgrade Cantegrit-Marsillon
		1125	1808	AO6 Occitanie
		1126	1809	AO6 Occitanie
	Germany ³⁷	40	650	BE-LUX-DE Long-Term perspective
		94	1493	PST Vierraden
		1050	1707	Converter stations and Subsea Cabling
		1058	1726	HVDC Line DE-CH
		1100	1766	Modernization of existing interconnector Hradec – Röhrsdorf
		1106	1794	Bornholm Energy Island: BEI-DE
	the Netherlands ³⁸	260	1255	Interconnector GB-NL

Table 12: List of storage projects in the draft EU TYNDP 2022 that are not present in the respective NDPs

Reason for absence in the NDP	Country	Project number	Project name	Comment by the NRA
The investment appertains to a non-TSO project or a storage project and non-TSO or storage projects are normally not included or present NDP.	Germany	1026	Hydro pumped storage Riedl	
		1046	Online Grid Controller “PSKW-Rio”	
		1048	WSK PULS (PHES)	
		1055	CAES Leer, Germany	
		1056	CAES Etzel, Germany	
		1057	CAES Harsefeld-Stade, Germany	
	the Netherlands	1013	CAES Zuidwending, NL	
		1038	CAES Zuidwending Extension	

³⁵ The Austrian NRA explains the projects are already discussed between NRA and TSO and part of the next years NDP process.

³⁶ The French NRA explains France's NDP was last updated in 2019 and a new one is to be transmitted to the TSO to the NRA soon.

³⁷ The German NRA explains the absent investments are expected to be assessed in the coming NDP (draft by TSOs expected for next spring, final document by BNetzA in early 2024)

³⁸ The Dutch NRA explains the investment will be part of the NDP 2024.

	Spain	1012	Purifying -Pumped Hydroelectric Energy Storage (P-PHES Navaleo)	The current NDP 2021-2026 includes the necessary electrical infrastructure (Substation Montearenas 400 kV).
		1027	P-PHES CUA	The permission for access has been denied and the current NDP does not include the necessary electrical infrastructure for its connection.
		1039	Reversible Hydraulic Power Plant "Los Guajares"	The current NDP 2021-2026 includes the necessary electrical infrastructure (Substation Saleres 220 kV).
		1041	Purifying-Pumped Hydroelectric Energy Storage "Velilla del Río Carrión" (P-PHES VELILLA)	The current NDP 2021-2026 includes the necessary electrical infrastructure (Substation Velilla 400 kV).
		1052	Purifying -Pumped Hydroelectric Energy Storage (P-PHES BUSEIRO)	The current NDP (2021-2026) does not include the necessary electrical infrastructure (Substation Narcea 400 kV).
		1054	Reversible hydroelectric power pump Aguayo II "	The current NDP 2021-2026 includes the necessary electrical infrastructure (Substation Aguayo 400 kV).
The investment is not included, because the latest NDP was elaborated earlier than the draft EU TYNDP.	Slovakia	1037	ELSEA - European Large Scale Energy Accumulation	
		1050	SE Integrator	
The investment is not advanced enough to be included in the NDP.	Ireland	1025	Silvermines Hydroelectric Power Station	

Table 13: List of cross-border relevant transmission investments that are not included in the draft EU TYNDP 2022

	NDP code	Investment name	Status	CAPEX	Expected com. date	Reason for non-inclusion in the TYNDP (if known to the NRA) and action recommended by the NRA
Hungary	MAVIR-TV2-006	Installation of the second circuit of Békéscsaba (HU) – Nadab (RO) 400 kV crossborder line	under consideration	4.75 million EUR on HU side	2026	Investment was included in NDP after submission period for the TYNDP 2022. After the approval of the NDP, MAVIR should contact Transelectrica about the project. If both TSOs agree, investment will be submitted for inclusion in the TYNDP 2024.
Italy	I-NDP 160	Voltage upgrade on an AC line between Nava (IT) and S. Dalmas (FR)	under consideration		undefined	
	I-NDP 176	AC line between Regoledo (IT) and a (non-defined) node in Switzerland	planned, but not yet in permitting		about 15 years from now	The Italian NRA recommends to include the investment in the TYNDP 2022.
Poland		Interconnection 750 kV Rzeszów (PL) - Khmelnitska (UA)	completed on the Polish side	2.7 million EUR	depending on the situation in Ukraine	
Romania	F.9	400kV OHL Gadalín (RO) – Suceava (RO)	In permitting	104.7 million EUR	2030	included in NDP after submission period for TYNDP 2022 include in the EU TYNDP
	F.10	400kV OHL Suceava(RO)-Balti(MD)	In permitting	109.85 million EUR	2030	included in NDP after submission period for TYNDP 2022 include in the EU TYNDP

Table 14: List of transmission investments which were present in the EU TYNDP 2020, but are not included in the draft EU TYNDP 2022

Relevant information available to the NRA regarding the non-inclusion	Project number	Invest. number in TYNDP 2020	Investment name	Reporting country code
Cancelled project	82	463	Srananagh - South Donegal	IE
		896	Omagh South to South Donegal	IE
	229	1674	Zielona Góra - Eisenhuettenstadt	PL
	233	1235	Conceptual project	ES
	234	1236	DKE-PL-1	PL
	241	1276	Upgrading of existing 220 kV line between SS Dakovo (HR) and TPP Tuzla (BA) to 400 kV line	HR
		1277	Upgrading of existing 220 kV line between SS Dakovo (HR) and Gradacac (BA) to 400 kV line	HR
		1278	Upgrading existing 220 kV SS Dakovo to 400 kV	HR
		1279	New double 400 kV line between SS Dakovo and location Razbojiste	HR
	293	1435	Southern Aegean Interconnector	GR
		1436	Southern Aegean Interconnector	GR
	349	1639	Enabling Works 1: Bellacorick-Oldstreet 2 x 245kV OHL	IE
		1640	Mares Cable 2: Cross Ireland Interconnector Cable	IE
		1641	Mares Converter Station 3	IE
		1647	MAREX Wind infeed cable 1	IE
		1648	MAREX Wind Infeed cable 2	IE
		1649	MAREX Wind Infeed cable 3	IE
		1650	MAREX Wind Infeed Cable 4	IE
		1651	Enabling Works 2: Glinsk Bellacorick Replacement 10 x 245kV bay substation	IE
		1654	Enabling Works 5: EIRGRID 2 x 245kV Connection bays at Oldstreet and associated works	IE
		1655	Enabling Works 6: 2 x 245/400 transformer at EIRGRID 220/400kV Substation Oldstreet	IE
	1056	1718	SS 400 kV ZONE 5	HR
	1057	1722	HVDC Line C3	DE
Commissioned project	23	60	FR-BE I: Avelin/Mastaing-Avelgem-Horta HTLS	BG, FR
	36	141	Kriegers Flak CGS	DE, DK
	37	142	Norway - Germany HVDC	DE, NO
	39	144	Audorf – Kassoe	DE, DK
	48	696	Hunew 1	HU
		697	Hunew 2	HU
		1500	1. SK-HU interconnection	HU, SK
		1501	2. SK-HU interconnection	SK
	62	386	3rd EE-LV interconnection	EE, LV
		1062	Riga CHP2 - Riga HPP	LV
	92	146	ALEGrO	BE, DE
	110	424	Norway - Great Britain	NO
	172	1487	ElecLink	FR
	173	1281	Aubange-Moulaine: PSTs	BE
	197	742	Pyhanselka-Petajavesi	FI
	200	309	Vitkov-Prestice	CZ

Relevant information available to the NRA regarding the non-inclusion	Project number	Invest. number in TYNDP 2020	Investment name	Reporting country code
		1712	R Vitkov	CZ
	207	939	Conneforde – Emden	DE
		1684	Conneforde-Wilhelmshaven	DE
	245	1246 ³⁹	Upgrade Meeden – Diele	DE, NL
	262	1257 ⁴⁰	Belgium-Netherlands: Zandvliet-Rilland	BE, NL
	320	1558	Double 400 kV OHL Cirkovce(SI)-Heviz(HU)/Zerjavinec(HR)	HR, HU, SI
	336	1556 ⁴¹	Prati (IT) – Steinach (AT)	AT, IT
	344	1541 ⁴²	Zwolle-Hengelo-Doetinchem-Dodewaard	NL
Non-compliance to Implementation Guidelines	1043	1685	Dollern – Stade	DE
	284	1619	LEG1	GR
	296	1437	Britib	ES, FR
	1077	1746	Crete-Northern Greece	GR
		1747	Northern Greece-North Macedonia	GR
		1748	North Macedonia-Bulgaria	BG
	1081	1745	Libya Greece	GR
		1749	Greece Albania	GR
Postponement by the PP	179	1016 ⁴³	DKE-DE (Kontek 2)	DE, DK
Reason unknown/ not available to the NRA or the provided information was not-sufficiently clear	62	735	Harku-Sindi 330kV OHL	EE
	82	897	Omagh South to Turleenan	IE
	167	998	Viking Link DKW-GB, TYNDP ID 167.998	DK
	200	1711 ⁴⁴	R Kocin	CZ
	208	151	Ganderkesee - Wehrendorf	DE
		156	Niederrhein-Dörpen	DE
	229	1270 ⁴⁵	Baczyna-Zielona Góra	PL
		1271	Zielona Góra – Plewiska	PL
		1272	Zielona Góra	PL
		1673	Zielona Góra - Polkowice	PL

³⁹ The German NRA reports the project is completed, while the Dutch NRA reports that according to the latest NDP, the NL part of the project is rescheduled to 2023.

⁴⁰ The Dutch NRA explains the investment has partially already been commissioned and the remaining part is under construction

⁴¹ The Austrian NRA explains the investment has been completed, but is not yet in operation. The Italian NRA further explains there are some pending upgrades planned to be completed in 2023 and that delays occurred due to construction-related complexities.

⁴² The Dutch NRA explains investment has partially been commissioned and for the remaining part (i.e. Zwolle-Hengelo), a new needs assessment will be carried out.

⁴³ The German NRA explains the project was not included in the last three NDPs.

⁴⁴ The Czech NRA explains majority of investments of Project of Common Interest ‘*National line Přeštice - Kočín*’ has already been commissioned and this investment is scheduled to be completed in 2023.

⁴⁵ The Polish NRA explains the investment is present in the NDP and its implementation is crucial for the evacuation of power from offshore wind energy and for the improvement of the reliability of power supply to consumers in the Lubuskie Voivodeship.

Relevant information available to the NRA regarding the non-inclusion	Project number	Invest. number in TYNDP 2020	Investment name	Reporting country code
	252	1456	Massenhoven - Van Eyck: HTLS upgrade	BE
	253	1224	Uprate of Creys-St Vulbas	FR
	258	667	Heide/West – Klixbüll	DE
	348	1546 ⁴⁶	NoordWest380	NL
	1043	1686	Wahle – Mecklar	DE
	1056	1719	SS 400/220 kV ZONE 6	HR
		1723	OHL 2x400 kV ZONE 5 - ZONE 6	HR
		1724	OHL 2x220 kV ZONE 6 – Plat	HR
		1725	SS 220/110 kV Plat	HR
	1061	1729	Reactive compensation	FI
Reason unknown (non-EU country)	1062	1730	Reactive compensation	FI
	1063	1731	ZuidWest380 West ⁴⁷	NL
	78	458	HINP-SEAB New Double Circuit	
	241	1530	Upgrading of existing 220 kV line between SS Gradacac (BA) and TPP Tuzla (BA) to 400 kV line	
	241	1531	Upgrading existing 220 kV SS Gradacac (BA) to 400 kV	
	264	1259	Beznau – Mettlen	
	264	1287	Bassecourt - Mühleberg	
	264	1288	Mettlen – Ulrichen	
	265	1290	Magadino – Ulrichen	
	265	1721	Magadino	
	264	1284	Pradella-La Punt	
	266	1286	Chippis – Lavorgo	
	266	1733	Bickigen – Chippis	
	266	1734	Chamoson – Chippis	
	1041	1687	AC Overhead Line 1 (Ras Ghareb-Nile West)	
	1041	1690	AC Overhead Line 2 (Nile West-Wadi El Natroon EHV)	

Table 15: List of storage projects which were present in the EU TYNDP 2020, but are not included in the draft EU TYNDP 2022

Reason for non-inclusion	Country	Project number	Project
cancellation	Ireland	1030	MARES Organic Power Energy Storage
info not available to the NRA	Belgium	1002	iLand
	Lithuania	1009	Kruonis pumped storage power plant extension project
	Spain	1011	Reversible pumped-storage hydroelectric exploitation “Mont-Negre” power 3,300 MW Zaragoza, Spain
		1036	SR Mar de Aragón

⁴⁶ The Dutch NRA explains the expected year of commissioning is 2023 and it has been rescheduled during the completion of the draft EU TYNDP 2022.

⁴⁷ The Dutch NRA explains the project has been delayed and the date of commissioning rescheduled. The delay occurred during the completion of the draft EU TYNDP 2022.

Non-compliance to Implementation Guidelines	Spain	1019	Hydro-pumped electricity storage GIRONÉS & RAÏMATS
	France	1042	Distributed network of Hydrogen storage and production by electrolysis with re-electrification through a fleet of FCEVs
Non-compliance to Implementation Guidelines (non-EU country)	United Kingdom	1014	Coire Glas
		1015	Cruachan 2
		1022	CARES (Compressed Air Renewable Energy Storage)

Table 16: Transmission investments and storage projects without information on CAPEX and/or OPEX or on the cost uncertainty range

	Investment number	Investment name
No information on CAPEX and OPEX	474	Substation Ribeira de Pena
	1214	Ejea de los Caballeros substation
No information on OPEX	1785	Inkoo-Hikiä
	1810	HVDC converter stations and cables
	1811	Offshore Wind Connection Centre Manche 2
	1812	Offshore Wind Connection South Brittany
	1808	AO6 Occitanie
	1809	AO6 Occitanie
	1813	Offshore wind connection South Atlantic
No information on the cost uncertainty range	38	HVDC Gatica-Cubnezais
	635	Elmed Project
	90	90
	1041	Rem. lim. in Central Italy
	86	New 66km double circuit 400kV OHL between existing Foggia and Villanova 400kV substations, also connected in and out to the Larino and Gissi substations
	645	OHL between the Laino and Altomonte in Calabria
	1727	Montecorvino-Avellino and Nord-Ben. in Campania
	1055 (storage)	CAES Leer, Germany
	1056 (storage)	CAES Etzel, Germany
	1057 (storage)	CAES Harsefeld-Stade, Germany

Table 17: Projects without an explanation for the necessity of clustering

Project number	Country code	Project name	Number of investments
259	HU, RO	HU-RO	6
270	ES, FR	FR-ES project -Aragón-Atlantic Pyrenees	4
276	ES, FR	FR-ES project -Navarra-Landes	4
1034	DE	HVDC corridor from Northern Germany to Western Germany	2
1046	FI	Finnish North-South reinforcement	5
1059	IT	Southern Italy	2

Table 18: Projects for which the status in the draft EU TYNDP 2022 does not correspond to the status of its least mature investment

Project number in the EU TYNDP 2020	Project name	Project status	Investment status of the least mature investment
85	Integration of RES in Alentejo	In permitting	Planned but not yet in permitting
170	Baltic States Synchronization with Continental Europe	In permitting	Under consideration
230	GerPol Power Bridge I	Under construction	In permitting
329	Stevin-Izegem/Avelgem (Ventilus): new corridor	Planned but not yet in permitting	In permitting
340	Avelgem-Courcelles (Boucle du Hainaut): new corridor	Planned but not yet in permitting	In permitting
349	MaresConnect	Under consideration	Planned but not yet in permitting

Table 19: Transmission investments not labelled as new in the draft EU TYNDP 2022

Investment number	Country code	Investment name	Progress of investment
1763	CH	Beznau - Mettlen	Investment on time
1764	SE	SE North-south Long-term reinforcements	Investment on time
1767	CH	Mettlen - Ulrichen	Investment on time
1768	CH	Bickigen - Chippis	Investment on time
1783	LT, LV, SE	Nybro-Hemsjo	Delayed
1784	LT, LV, SE	Ekhyddan-Nybro	Delayed
1815	DE, DK, NL	Dutch Hub	Investment on time
1816	DE, DK, NL	German Hub	Investment on time
1817	DE, DK, NL	Interconnection Danish hub to Dutch hub	Investment on time
1818	DE, DK, NL	Interconnection Danish hub to German hub	Investment on time
1819	DE, DK, NL	Interconnection Dutch hub to German hub	Investment on time
1827	RO, RS	Upgrade of the existing 220kV double circuit OHL Arad -Timisoara - Sacalaz to 400kV	Rescheduled
1832	HU, RO	RO1	Investment on time
1833	HU, RO	RO2	Investment on time
1834	HU, RO	RO3	Investment on time
1835	HU, RO	RO4	Investment on time
1836	HU, RO	RO5	Investment on time

Table 20: Transmission investment with inconsistent information about the progress and commissioning date

Investment number	Country code	Investment name	Expected commissioning year in TYNDP 2020	Expected commissioning year in draft TYNDP 2022	Progress of investment in the draft EU TYNDP 2022
86	IT	New 66km double circuit 400kV OHL between existing Foggia and Villanova 400kV substations, also connected in and out to the Larino and Gissi substations	2024	12-2027	On time

Investment number	Country code	Investment name	Expected commissioning year in TYNDP 2020	Expected commissioning year in draft TYNDP 2022	Progress of investment in the draft EU TYNDP 2022
96	IT	New 30km single circuit 400kV OHL between the future substations of Deliceto and Bisaccia, in the Candela area	2021	05-2022	On time
273	BG, RO	400kV OHL Cernavoda-Stalpu	2023	12-2022	On time
308	CZ	Vernerov-Vitkov	2023	06-2024	On time
403	SE	Reinforcements SE2-SE3 in Sweden	2030	01-2035	On time
445	BE	BRABO II: Zandvliet - Lillo - Liefkenshoek	2020	01-2021	On time
605	BE	BRABO II: Lillo 380	2019	01-2020	On time
810	FR, IE	France Ireland Interconnector	2026	03-2027	On time
934	BE, GB	Nautilus multi purpose interconnection UK - BE	2028	12-2030	On time
997	AT, DE	997 Pleinting - St. Peter	2028	12-2030	On time
1050	BE	Van Eyck - Gramme: HTLS upgrade	2029	12-2032	On time
1107	BE, DE	2nd interconnector between Belgium and Germany	2035	12-2038	On time
1431	GR	Lavrio - Levitha	2024	01-2025	On time
1458	FR, IT	SACOI3	2024	12-2026	On time
1473	AT, DE	Isar/Altheim/Ottenhofen - St. Peter	2024	12-2026	On time
1504	DE, DK, NL	Danish Hub	2035	01-2032	On time
1505	DE, DK, NL	Interconnection DKw to Danish hub	2035	01-2032	On time
1515	BE	Gramme - Courcelles: HTLS upgrade	2033	12-2038	On time
1517	BE	Mercator - Bruegel: HTLS upgrade	2025	12-2026	On time
1535	BA, HR	New Substation 400/110 kV Lika	2029	12-2030	On time
1557	IT	Tyrrhenian HVDC link - West	2025	12-2027	On time
1559	GR, MK	Refurbishment of the 400kV Meliti (GR)-Bitola (MK) interconnector	2036	06-2035	On time
1593	ES ⁴⁸	Uprate Gatica-Guenes	2025	12-2026	On time
1595		Uprate Gatica-Amorebieta-Ichaso	2025	12-2026	On time
1597		Uprate Gatica-Azpeitia	2025	12-2026	On time

⁴⁸ The Spanish NRA explains the dates have been amended according to the Spanish NDP 2021-2026.

Investment number	Country code	Investment name	Expected commissioning year in TYNDP 2020	Expected commissioning year in draft TYNDP 2022	Progress of investment in the draft EU TYNDP 2022
1620	DE, LU	Substation Aach	2025	12-2026	On time
1629	DE, LU	Substation Bofferdange	2025	12-2026	On time
1660	EE, LT, LV, PL	New 330 kV Darbenai substation	2025	12-2024	On time
1693	DE	HVDC from Heide/West to Polsum	2030	12-2031	On time
1738	GR, TR	New AC 400 kV interconnection line Greece - Turkey	2036	06-2035	On time

Table 21: Investments with insufficiently concrete description

Investment number	Country code	Investment name	Description of investment
650	BE, DE, LU	BE-LUX-DE Long-Term perspective	The technical solution is subject to further studies
1521	IT	New HVDC line between Villanova and Fano existing 400 kV substations	HVDC lines
1583	AT	Vorarlberg	Voltage increase of all existing lines to 380 kV (without an increase of the line cross-section) and 2 new 380/220 kV transformers in Bürs
1557	IT	Tyrrhenian HVDC link - West	Italian HVDC tri-terminal link
1763	CH	Beznau - Mettlen	line
1767	CH	Mettlen - Ulrichen	AC Line
1768	CH	Bickigen - Chippis	line
1795	IT	Tyrrhenian HVDC link - East	Tyrrhenian HVDC link - East