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CONSOLIDATED REPORT

ON THE PROGRESS OF ELECTRICITY AND GAS PROJECTS OF COMMON INTEREST

Ljubljana
27 June 2019

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Agency for the Cooperation of Energy Regulators

Contents

1 Summary

1.1 Legal basis and background

Article 5 of Regulation (EU) No 347/2013 requires the Agency to monitor the progress achieved in implementing the projects of common interest (PCIs). The Agency carries out this monitoring on the basis of annual reports submitted by the project promoters and inputs received from the national regulatory authorities (NRAs) cooperating in the framework of the Agency. The present Report represents the results of the fourth instance of the Agency's annual monitoring of the progress in PCI implementation[1]. The Report covers the period from 1 February 2018 until 31 January 2019.

After receiving the promoters' reports, the Agency assessed the completeness and the quality of the received information. The Agency requested clarifications from the promoters regarding missing, incomplete or inconsistent data, and also consulted the NRAs regarding the quality and completeness of the data relevant to their jurisdictions.

Overall, the submitted information, its scope and quality were deemed acceptable for the purpose of preparing this consolidated Report, with a few exceptions as indicated in the sections on electricity and gas below.

This summary gives an overview of the Agency's main findings and recommendations for the electricity and gas sectors. Separate chapters of the Report present in-depth analyses of the electricity and gas projects and detailed sector-specific findings and recommendations.

Differences between the electricity and gas chapters are primarily due to the specific features of the two sectors, which make some issues only applicable to either gas or electricity, as well as to the varying availability of data.

1.2 Main findings

1.2.1 Fulfilment of the reporting obligations and quality of the reports

Out of 110 electricity and 53 gas PCIs, for 106 electricity and 52 gas PCIs an annual report has been submitted in 2019. 4 electricity and 1 gas PCIs did not submit an annual report due to various reasons, including planned withdrawal of the PCI status, lack of project promoter after the company was wound up due to insolvency or the cancellation of the project. Although a sufficient level of completeness of the submitted data was achieved for most data categories and the overall consistency of the data has improved compared to the previous year, certain inputs[2] were still missing or of inadequate quality.

The Agency re-affirms the importance of providing complete datasets and ensuring the integrity and the consistency of the data throughout the entire PCI process, from the moment when the TYNDP drafting begins to the PCI selection and PCI monitoring and it is of the view that projects which do not provide credible information should not be granted a PCI status.

[1] In this case, the 2017 PCI list. (Cf. Commission Delegated Regulation (EU) 2018/540 of 23 November 2017) https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=CELEX:32018R0540).

[2] In electricity, a survey form was used for collecting data for the purpose of the 2018 PCI monitoring, and in gas the Agency's infrastructure information system "VALVE". The missing inputs typically belong to the same categories of data as indicated in last year's report.

The Agency stresses that promoters are obliged to submit an annual report for each PCI each year following the year of inclusion of the project in the PCI list. Failure to submit such a report represents a breach of Regulation (EU) No 347/2013.

1.2.2 Consistency of the 2017 PCI list with the NDPs

The Agency identified several PCIs which are not included in the National Network Development Plan (NDP) in one or several hosting Member States. The Agency encourages the relevant entities to ensure that all relevant PCIs are included in the NDPs in line with Article 3(6) of Regulation (EU) No 347/2013.

1.2.3 PCI status and progress

The Agency recognises that 23 electricity and 9 gas PCIs advanced their status during the monitored period. Similar to previous year, the largest number of PCIs are in the stage of permitting. Despite the advancement in status of a reasonable number of projects, the commissioning dates for almost half of the PCIs have again been shifted into the future compared to the dates foreseen in previously reported schedules, adding up to the accumulated delays that are repeatedly noted in the Agency's annual PCI monitoring reports.

For 2 electricity and for 5 gas PCIs, no works or activities were reported to have been carried out during 2018. The Agency maintains its view that Regional Groups should scrutinise the activities performed by each PCI and the reasons for non-performance, when project promoters re-apply for the PCI status for these projects.

1.2.4 Costs and benefits

The investment costs for the electricity PCIs, as reported by the promoters, amount to €49.5 billion (in 2019 values[3]), while for the gas PCIs they amount to €42.9 billion. The cost tag is actually even higher, since the expected life-cycle costs of the projects also have to be considered. These figures represent an increase of less than 2% for electricity PCIs and of 1.5% for gas PCIs compared to the expected overall budget of the same projects in 2018[4].

The total amount spent by end of 2018[5] was €8.4 billion for electricity PCIs and €11.4 billion for gas PCIs, representing 17% of the overall PCIs budget for electricity and 27% for gas, while according to the planning it is expected that more than half of the overall projects' budget should be incurred in the coming 4-5 years.

Regarding the forecasted benefits of the electricity projects, the Agency notes that several project promoters reported changes compared to the benefit figures which were considered in the PCI selection process of 2017 and used in the 2018 PCI monitoring report in order to increase the integrity and consistency between the PCI selection data and the PCI monitoring data. The project promoters explain the changes mainly by referring to the (new) ENTSO-E TYNDP 2018 or additional benefits which are not properly captured – or not captured at all - by the ENTSO-E CBA methodology.

[3] Cost data refers to the value as of the expected commissioning date of the projects. The Agency converted this data to present value as of 2019 by applying a factor of 4% p.a., in order to make the cost data of projects comparable and allow for cost data aggregation.
[4] For this comparison only the projects for which the investment cost data were available both in 2018 and 2019, i.e. 82 projects in electricity and 53 projects in gas are considered.
[5] For most PCIs over a period of time of more than 5 years and 2 months (i.e. since the establishment of the first PCI list in October 2013).

The assessment of the benefits of the gas PCIs again faced serious difficulties. The Agency did not receive comprehensive monetised benefits data for the gas projects, as data was only reported for 6 gas projects, the same low figure as in 2018. The Agency reiterates its recommendation that project promoters should evaluate the costs and benefits of their projects from the inception of the project and should report the progress of the costs and benefits over the entire project cycle, from inception to commissioning.

1.2.5 Regulatory treatment

The interest of the promoters to use the array of available regulatory tools in Regulation (EU) No 347/2013 remained relatively low. The submission of investment requests and the resulting issuing of cross-border cost allocation (CBCA) decisions are the tools most frequently used by the promoters. The actual and planned filing of applications for project specific risk-related incentives appears to occur only in exceptional cases.

2 Volume 1: ELECTRICITY PROJECTS

2.1 Introduction

2.1.1 Fulfilment of the reporting obligations

The 2017 PCI list includes 110 electricity PCIs. By the legal deadline of 31 March 2019, the Agency received 101 reports from the relevant project promoters[6]. 5 additional reports were submitted after the legal deadline, but the Agency could still consider them in its analysis. In 2 instances[7], no report was submitted as those projects currently do not have any promoter, while in 2 instances the project promoters decided not to submit a report as they do not wish to maintain the PCI status of their respective projects[8].

The Agency stresses that promoters are obliged to submit an annual report for each PCI each year following the year of inclusion of the project in the PCI list, irrespective of whether they intend to re-apply for the PCI status for their project(s). Failure to submit such a report represents a breach of Regulation (EU) No 347/2013.

The Agency used the online EU Survey tool to collect the information from the promoters. On 1 February 2019, the single contacts appointed by the project promoters for each PCI were invited to submit the PCI reports by filling in the Agency's templates.

2.1.2 Completeness, consistency and adequacy of the submitted data

The Agency checked the received data in order to assess its completeness and consistency. The Agency notes that the information related to the project's technical parameters, status and progress appears to be adequately provided, after incorporating the requested clarifications from the project promoters, as well as additional publicly available data or data received from the relevant National Regulatory Authorities ("NRA") However, the Agency notes that the completeness of the information for some non-mandatory questions[9] is still low for some information categories[10]. The main reasons raised by project promoters to justify the missing data are uncertainties regarding the projects.

The **consistency of the submitted data improved compared to last year**[11], but in several instances, the Agency had to require further clarifications, especially regarding the consistency

[6] In this volume of the Report, the focus is on electricity PCIs, therefore "all PCIs" refers to all the electricity priority projects only, and not to gas PCIs, unless otherwise indicated.
[7] The Agency was informed that PCIs 1.12.1 'Compressed air storage in Lane' and PCI 1.12.2 'Compressed air energy storage in Chesire' have currently no project promoters as Gaelectric CAES NI Limited declared insolvency in September 2018 and wound up.
[8] For PCI 1.8.2 'Reinforcement of internal lines in southern Norway' the project promoter decided not to submit a report for the following reasons: the project is purely internal Norwegian, all permissions are received and the project is about to be finalised, there is no intention to apply for Connecting Europe Facility ("CEF") grants, and the project consists of several investments complicating the reporting. For PCI 1.13 'Interconnection between Iceland and United Kingdom [currently known as "Ice Link"]', the project promoter initiated the withdrawal of the application for the 4th PCI list as the energy legislation is currently under public discussion in Iceland and the process for building an interconnection to Iceland is among other topics a part of the public discussion, while the legal outcome and decision following the public discussion is still uncertain.
[9] All questions of the questionnaire should be filled in by promoters, however, for the most important ones, the report could not be technically submitted if an answer to these questions was not provided.
[10] For example, expected start and end dates for certain implementation stages, while applicable to all projects, are available only for about half of the PCIs.
[11] The Agency sent 150 clarification questions or further data requests concerning 82 PCI reports in 2018, compared to about 60 clarification questions concerning 40 PCI reports in 2019.

of the implementation plan dates, expected investment costs and the incurred or additional contracted costs.

Key findings and recommendations:

- The Agency underlines that all information requested by the Agency through the on-line template should be duly and accurately provided by the project promoters to increase clarity regarding the project's progress and avoid the burden of subsequent request for and provision of additional data.
- The Agency positively notes that the consistency of the submitted data improved compared to previous year, even if there is still room for improvement.
- The Agency reaffirms its view that consistency and integrity of the project data throughout the whole PCI process[12] is essential and that projects which do not provide credible information should not be granted the PCI status.
- The Agency recalls the importance that Regional Groups incorporate consideration of the PCI monitoring results into the PCI selection process.

2.2 Overview of the electricity PCIs

2.2.1 General statistics of the PCIs

The 2017 PCI list includes 110 electricity PCIs. Out of the 106 projects for which annual reports were submitted, 89 PCIs are transmission projects, 4 are smart grid projects and 13 are storage projects. Out of the transmission projects, 46 are interconnectors and 43 are internal projects. The distribution of the current electricity PCIs per priority corridor and thematic group was already presented in the Agency's consolidated report on the progress of electricity and gas PCIs in 2018 (p.10)[13].

Technical changes

5 PCIs reported changes to their technical description compared to last year report. 2 transmission PCIs reported one of the following technical changes:

- Change of the length of an offshore transmission line;
- New site for a substation implying an increase in the length of the transmission line.

3 storage PCIs reported one of the following technical changes:
- Change in the generation capacity;
- Design changes to eliminate environmental impact;
- High voltage centre replacement.

None of these technical changes appears to have resulted in an increase of the investment costs

[12] i.e. from TYNDP drafting to PCI selection and monitoring
[13] https://www.acer.europa.eu/Official_documents/Acts_of_the_Agency/Publication/Consolidated%20Report%20on%20the%20progress%20of%20electricity%20and%20gas%20Projects%20of%20Common%20Interest%20for%20the%20year%202017.pdf

of the concerned PCIs[14].

The Agency notes that, in contrast with the previous year's findings[15], storage projects appear to have encountered more technical changes. However, due to the relatively low number of changes reported, it is premature to draw any conclusion.

For detailed information on the technical changes, please refer to Annex II.

2.2.2 Presence of the PCIs in the TYNDP and NDPs[16]

The Agency observes that all the transmission and storage PCIs assessed in this Report (i.e. 102 projects) are included in the ENTSO-E TYNDP 2018, which will be used as the basis for the selection of the 2019 PCI list[17].

Project promoters indicated that 3 transmission PCIs are included in some, but not all of the relevant NDPs[18], and 10 PCIs do not appear in any NDP: 5 are private storage projects, 3 are smart grids projects and 2 are transmission projects. In addition, based on the information provided by NRAs, the Agency identified 5 additional PCIs which are included in some, but not all of the relevant NDPs and 4 additional PCIs which do not appear in any NDPs. The Agency concludes that **84 PCIs are included in the latest relevant NDPs**[19].

The reasons for the non-inclusion of the PCIs in the NDP as provided by project promoters and/or NRAs were mainly insufficient advancement of the project (e.g. the project is still "under consideration" and has not received a regulatory approval), cancellation of the project or the general regulatory framework regarding the specific NDPs, i.e. they do not include (in general) third-party, storage, smart grid projects and/or projects of a Distribution System Operator ("DSO") .

For further details on the projects not included in the relevant NDPs and the reasons for their non-inclusion, please refer to Annex I.

[14] Although for some of these PCIs there was an investment cost increase reported it was due to different reasons and not related to the technical change.
[15] 9 transmission projects reported technical changes and none of the storage projects
[16] Pursuant to Article 3(6) of Regulation (EU) No 347/2013, a PCI included in the Union list shall become an integral part of the relevant regional investment plans and of the relevant national 10-year network development plans and other national infrastructure plans concerned, as appropriate. Those projects shall be conferred the highest possible priority within each of those plans.
[17] The TYDNP 2018 does not include the smart grid PCIs. It is to note, however, that pursuant to Annex III 2 (3) of Regulation (EU) No 347/2013, there is no requirement for smart grid projects to be in the Union-wide TYNDP to obtain a PCI status.
[18] For the purpose of this Report, the relevant NDPs correspond to the NDP of the countries or jurisdictions, which are hosting the PCI.
[19] The Agency notes that project promoters' view regarding the NDP inclusion may differ from those of the NRAs, where for example the project is only listed in the NDP as a project included in the ENTSO-E TYNDP without any further consideration.

Key findings and recommendations:

- 2 PCIs reported changes in their technical description. The Agency notes that substantial technical changes may affect the costs and/or benefits of the PCIs**. Therefore, the Agency invites the Regional Groups to consider the reported changes in the next PCI assessment.**
- The Agency identified several PCIs which are not included in the NDPs of the hosting countries. **The Agency encourages all relevant stakeholders to pursue maximum consistency between the NDPs and the PCI list.**
- The Agency recalls its recommendation[20] that **NDPs' scope should be expanded to allow the inclusion of third-party projects, where it is not yet allowed. Moreover, NDPs should include/inform on studies and "under consideration" projects and clearly flag them as such.**

2.3 PCI status and progress

2.3.1 Current PCI status[21]

Similar to previous years, the Agency considers that the status of the least developed element of the PCI constitutes the overall status of the project. This information is therefore rather conservative, as some of the investment items included in the PCI might be in a more advanced implementation stage.

3 electricity PCIs were commissioned between 1 February 2018 and 31 January 2019[22], which means that in total 4 PCIs of the 2017 PCI list have been commissioned.

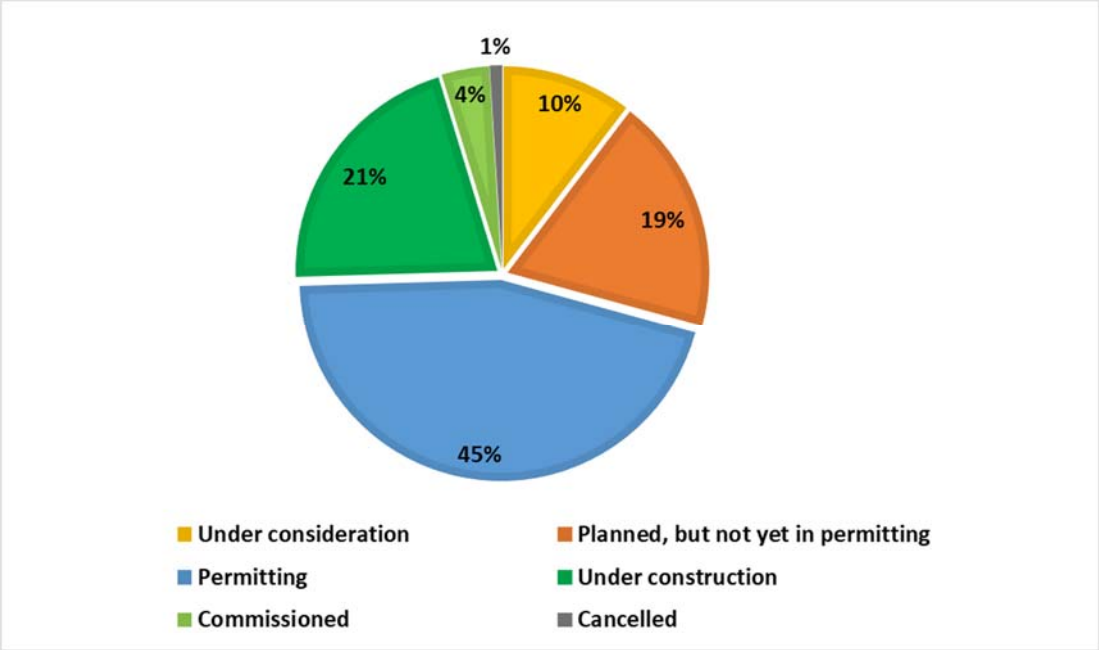
Overall, the Agency notes that most projects (i.e. 45%) are still in permitting, however the share of projects, which are in this or in a more advanced status, has increased (from 63% to 70%) compared to last year. The current status of the electricity PCIs (as of 31 January 2019) is shown in Figure 1.

[20] Agency's Opinion No 13/2019, p.14.

[21] In order to classify the PCIs based on their status, promoters had to choose between one of the pre-defined categories as follows: Commissioned; Cancelled; Under construction; Permitting; Planned but not yet in permitting; Under consideration. Being "commissioned" or "cancelled" means that the PCI has completed its final stage. A PCI's progress across the other stages – in the order indicated above – demonstrates an advancing maturity level of the project. In the Agency's view, a key moment to consider whether a project is sufficiently mature is the time when the promoter files an investment request. Pursuant to Section 1.2 of the Agency's Recommendation No 05/2015 regarding cross-border cost allocation (CBCA), a "sufficiently mature" project is a project exhibiting: sufficient certainty about the costs and reasonable foresight of the benefits assessed by the cost-benefit analysis, and good knowledge about the factors affecting expected costs and benefits and their ranges. In addition, permitting procedures need to have started in all hosting countries and commissioning is to be achieved indicatively within 60 months.

[22] Including one PCI for which the construction works had been finalised, but the line is not in commercial operation yet.

Figure 1 - Share of electricity PCIs in the various status categories



Evolution of the status of electricity PCIs in 2018-2019

The vast majority of the PCIs (i.e. 79) did not change their status, while **19 indicated progress in their status[23] (in addition to the commissioned PCIs)** between 1 February 2018 and 31 January 2019. In addition, 3 projects (seemingly) regressed and 1 project was cancelled.

More specifically,

- 4 PCIs advanced from "under consideration" to "planned, but not yet in permitting" status;
- 7 PCIs advanced from the "planned, but not yet in permitting" status to the "permitting" status;
- 1 PCI advanced from "planned but not yet in permitting" to "under construction" status;
- 6 PCIs advanced from "permitting" to "under construction" status;
- 2 PCIs seemingly regressed from the status "under construction" to "permitting"[24];
- 1 PCI seemingly regressed from the status "planned, but not yet in permitting" to "under consideration";
- The cancelled PCI was "under consideration".

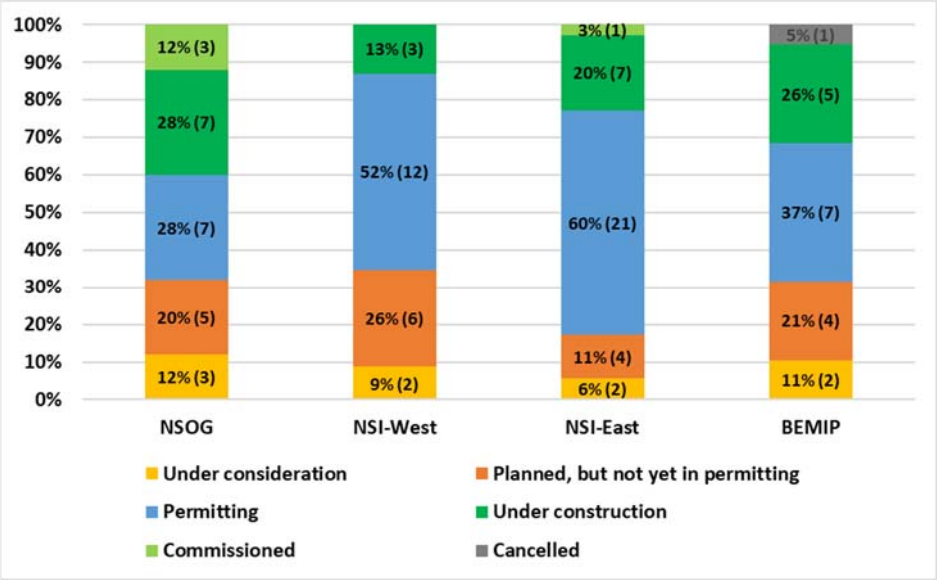
Figure 2 below shows the status of projects in the different priority corridors. Out of the 4 PCIs "commissioned", 3 are in the NSOG corridor and 1 in the NSI-East. The highest share of PCIs

[23] Please note that the change (or lack of change) of the status gives information only about the PCI as a whole. A more detailed focus into the implementation schedule and the reports on the work carried out provides a full overview of the actual progress of the project.

[24] The Agency notes that the regression related to 2 projects within the same cluster and the cluster includes 1 investment which is already under construction. Therefore, this regression seems to be resulted from more accurate data provision in line with the Agency's status definitions.

which are at least in permitting (over 80%) is in the NSI-East corridor, which is at least 10% more than in any other corridor.

Figure 2 - Breakdown of electricity PCIs by status in the priority corridors



2.3.2 Progress of works

Project promoters were invited to indicate the type of works and activities, which were carried out regarding their projects between 1 February 2018 and 31 January 2019.

The promoters reported on average 4 activities they have been working on during the reporting period with a minimum of 1 activity and a maximum of 12[25]. The vast majority of project promoters reported to have carried out activities related to permitting, including preparation of permitting files (55%), negotiations with landowners (44%), followed by activities related to environmental studies (37%) and technical feasibilities studies (37%). The list of activities reported and the respective share of PCIs are provided in Table 1.

Table 1 - Activities reported and the respective share of PCIs

Reported activities	Share and number of projects reporting this activity
Preparation of permitting files, contracts and other documents	55% (58)
Negotiations with landowners and land acquisition	44% (46)
Environmental study	37% (39)
Technical feasibility study	37% (39)

[25] When comparing the consistency of the reported works and activities with the implementation schedule of the PCIs, the Agency notes that, in some cases, the project promoters seem to have listed all the works or activities performed until 2018 and not only those performed over the last year, which slightly limits the reliability of the findings regarding the progress of works in 2018.

Tendering	36% (38)
Detailed technical design	34% (36)
Public consultation	32% (34)
Identification of alternative solutions / site identification	31% (33)
Spatial planning study	27% (29)
Socio-economic feasibility study	25% (26)
Construction	21% (22)
Other work or activity (please specify)	16% (17)
Preparatory works for construction (e.g. land preparation)	13% (14)

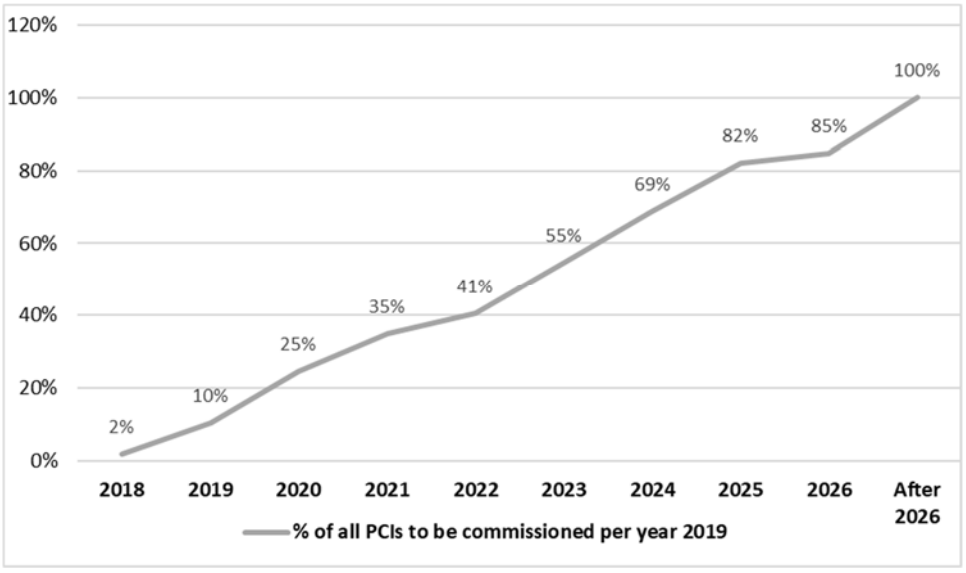
2 PCIs (1 transmission and 1 smart grid project) did not report any work or activity performed during the studied period, which is a significant improvement compared to last year, when 16 projects reported no work performed. The transmission project has been rescheduled due to a change to a new renewable-based generation, while the smart grid project reported difficulties encountered as it was not awarded financial support from CEF and expect now funding opportunities at country level.

The projects without any activity reported for the studied period are presented in Annex III.

2.3.3 Expected commissioning dates

Figure 3 below shows the cumulative share of PCIs expected to be commissioned each year, based on the foreseen commissioning dates reported by promoters.

Figure 3 - Cumulative share of electricity PCIs to be commissioned per year



The Agency notes that **project promoters expect to construct and commission about half of the projects within the next 4 years**. During the 2015 PCI monitoring, the Agency identified 32 projects, which were expected to be commissioned by the end of 2018 (i.e. within

4 years). Out of these 32 projects, 11 (34%) are still on the 2017 PCI list, and have not been commissioned; 6 projects are under construction and 5 projects are in permitting. In this regard, **the Agency considers the project promoters' current expectations regarding the commissioning of the projects rather optimistic.**

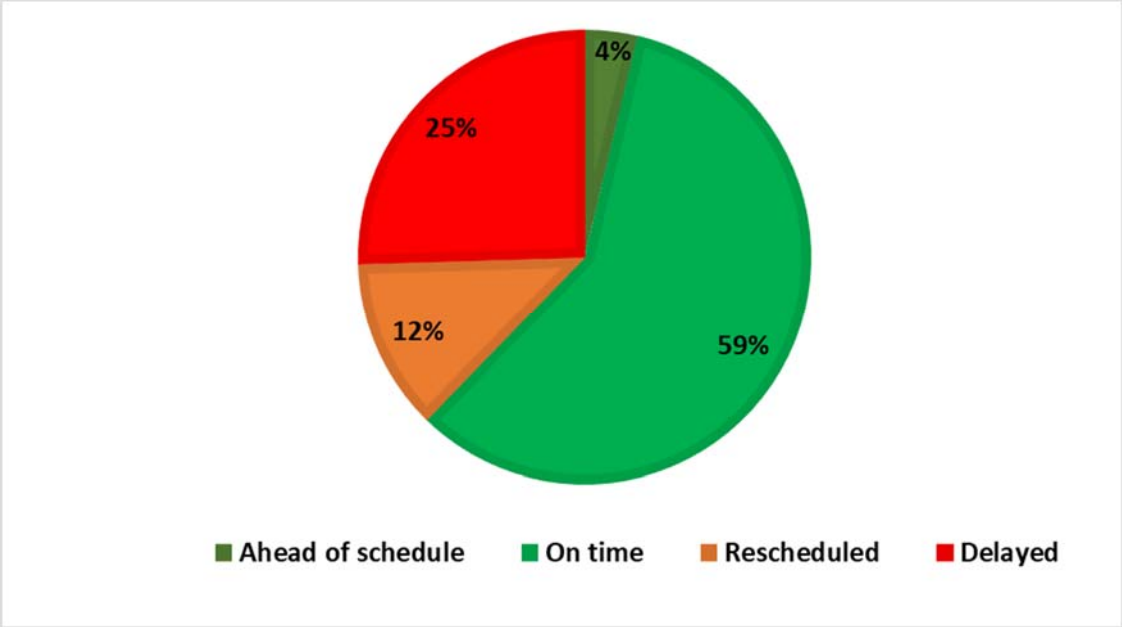
The Agency also notes that, in the 2017 PCI list, there are currently 11 projects "under consideration" and 3 projects, which are already "planned", but expected to be commissioned in more than 10 years from now. While the Agency acknowledges that these projects may still benefit from obtaining the PCI status as it provides possibilities to apply for grants for studies, the **Agency is of the view that there is a significantly different level of uncertainty accompanying the evolution and implementation of such projects, and such feature should be clearly flagged in the PCI list**.

2.3.4 Progress of PCI implementation

In each annual report, promoters indicate the progress of their projects, i.e. whether their project is on track compared to the commissioning date planned in the previous year. Based on their answer a project may be qualified as "ahead of schedule", "on time" or "behind schedule". A project can be behind its previous schedule due to either "delay" or "rescheduling", which has to be further specified by the promoters. For more information regarding the definitions used for reporting on the projects' progress, please refer to the Agency's Opinion No 16/2014 (Section 5) and the Agency's Opinion No 14/2019 (p.3).

The Agency finds that, compared to last year's schedule, 67 PCIs are on time or even ahead of schedule, 26 PCIs are delayed and 12 PCIs are rescheduled. **The Agency acknowledges that, for the second year in a row, the share of projects on time (or ahead of schedule) keeps increasing** (63% this year compared to 57% in 2018 and 53% in 2017) and consequently the share of delayed and rescheduled projects keeps decreasing (25% delayed projects compared to 26% in 2018 and 31% in 2017, while 12% rescheduled projects compared to 15% in 2018 and 14% in 2017). The overall progress of electricity PCIs is presented in Figure 4.

Figure 4 - Progress of electricity PCIs

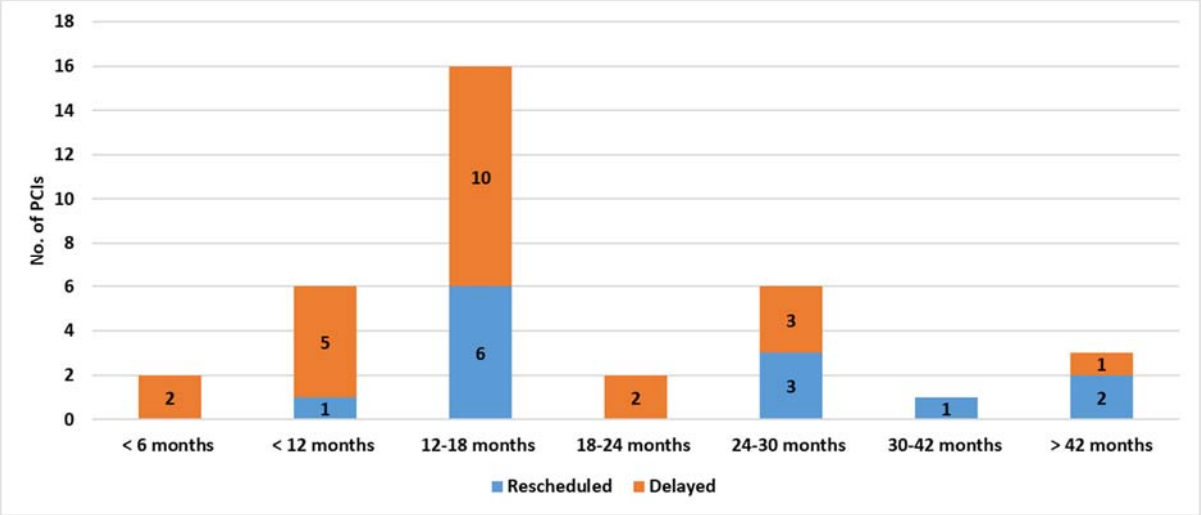


Average duration of delays and rescheduling

As shown in Figure 5, the duration of delays and rescheduling varies significantly across the projects (i.e. between less than 6 and over 42 months' delay)[26]. Overall, the Agency acknowledges an improvement on this aspect compared to last year as the **average delays decreased from 22 months to 17 months**. However, the Agency also notes that out of the 26 delayed projects, 7 are delayed for the second year in a row and 6 for the third year in a row, while out of the 12 projects rescheduled this year, 5 had already encountered rescheduling the year before and for 3 additional projects this was the third year in a row that the commissioning date is rescheduled or delayed.

[26] The information duration of delay or rescheduling was available for 10 rescheduled and 21 delayed projects.

Figure 5 - Duration of Delay and Rescheduling for electricity PCIs



2.3.5 Reasons for rescheduling, delays and difficulties encountered by the project promoters

Project promoters were invited to indicate the main reasons for rescheduling and delays encountered during the project implementation, using the period between 1 February 2018 and 31 January 2019 to evaluate the PCI progress.

2.3.5.1 Rescheduling

Similar to the previous years' findings, the most frequently reported reason for rescheduling is that the project was at an initial stage and the implementation plan was preliminary (5 instances, 36%), but now that the projects are gaining more maturity, a new commissioning date is set. The second most common reason is that the investment was rescheduled in correlation with other investment (5 instances, 21%), typically deprioritised against other transmission projects. The 2 other instances of rescheduling are due to voluntary consultation process by the project promoter or changes on the generation side.

2.3.5.2 Delays

Same as in previous years, the most frequently reported main reason for delays is still related to the permit granting process (46%)[27], including environmental problems (3 instances), public opposition (3 instances), national law changes affecting permitting (1 instance) and prolongations in obtaining permits for various other reasons (5 instances), including public authority requiring further studies and more complex permit granting procedure than originally expected.

The other main (non-permit granting related) reasons are the following:

[27] In 2017, 31% of the PCIs were delayed and about 60% of these delays were due to permitting/acceptance issues. In 2018, 26% of the PCIs were delayed and 44% of these delays were due to permitting/acceptance issues.

- delays in construction work (4 instances);
- delays due to lawsuit and court proceeding (3 instances);
- delays due to risks related to the national regulatory framework or uncertainty of regulatory opposition (2 instances);
- delays related to other infrastructure (2 instances);
- complex negotiations due to specific design (1 instance);
- financing problems (1 instance);
- lack of agreement between the involved countries (1 instance).

In 11 instances, the project promoters reported, beyond the main reason, some additional reasons for delays, meaning that the overall delay for some projects may be the combined result of the various reasons. In general, the reported additional reasons were similar to the main reasons listed above.

2.3.5.3 Difficulties

18 PCIs reported difficulties, which did not result in delays or rescheduling of the commissioning date. Some of the PCIs listed more than one difficulty, therefore the total number of occurrences is higher than the number of PCIs impacted by them.

Similar to previous years' findings, the most common difficulties encountered appear to be related to the permitting procedure, more specifically due to national law changes (5 instances), to environmental problems (5 instances) and to other specific permit granting reasons (5 instances). These are followed by difficulties in tendering process (3 instances) and in acquisition of land (2 instances). The 6 other reasons reported are projects specific, including lawsuit, difficulties in the preparation of the necessary application files by the project promoter, risk related with desynchronisation from third countries.

The Agency notes that for 7 PCIs certain difficulties were reported for the second or the third consecutive year, while they did not result in any actual delays in the project's implementation.

2.3.6 Duration of implementation

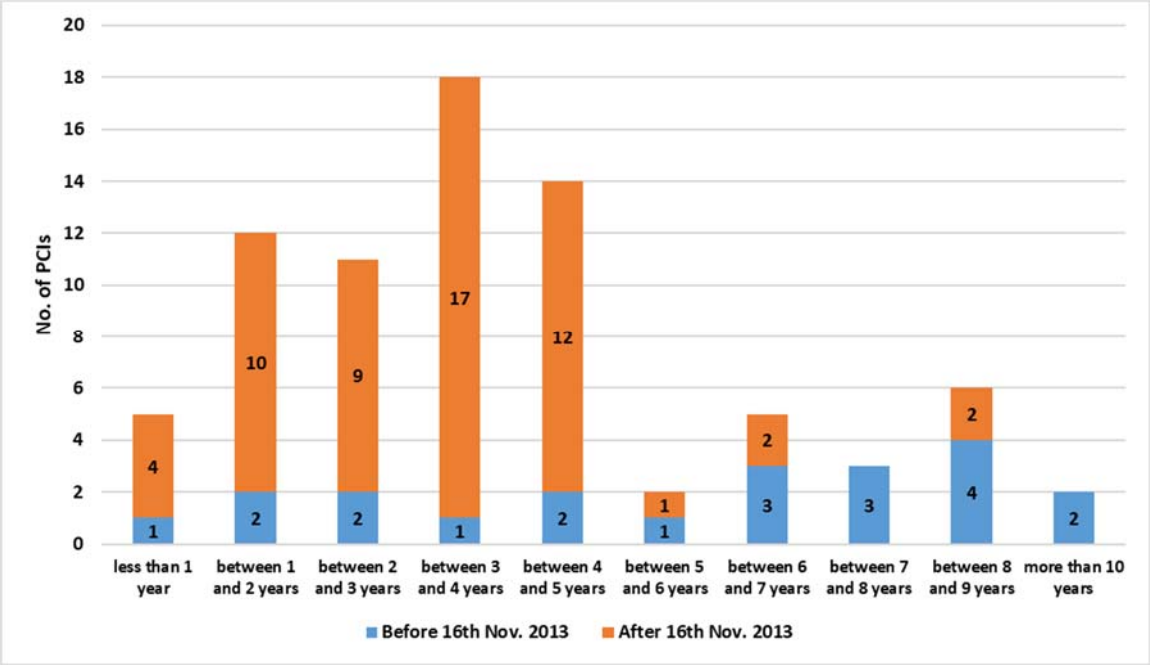
For the purpose of this Report, the overall duration of the implementation of an electricity PCI is considered to be the time period between the date of request for the planning approval[28] and the commissioning date. **The average (expected) duration of implementation of the electricity PCIs is about 9.9 years**[29], (i.e. slightly decreased by half a year compared to last year's finding). The shortest implementation duration is less than 3 years (a storage project), while the longest is over 20 years. One third of the PCIs are expected to be implemented within 7 years, while for more than one third of them the duration is expected to be 11 years or more.

[28] Planning approval is the approval (at the level of national development planning) by the NRA or by the competent Ministry or national competent authority, as provisioned in the national law of each country.
[29] This figure is based on the analysis of the data of 65 PCIs, for which the expected dates for start of planning and commissioning were available.

2.3.7 Duration of permitting

The Agency notes that the average (expected or actual) duration of permitting is about 4 years[30]. As shown in Figure 6, the expected duration of the permit granting process for approximately 60% of the projects is less than the average. However, the Agency also notes that 20% of the projects expects that the permit granting process will exceed 5 years, including 2 PCIs, for which the expected duration of the permit granting process is more than 10 years. The Agency confirms its previous year's finding that those **PCIs which applied for permit granting after 16 November 2013 are in general more optimistic about the expected duration of the permit granting process than those which applied before.** The average duration of permit granting is about 6 years for the former and about 3 years for the latter. However, the Agency also notes out of the 57 PCIs which submitted an application for permit granting after 16 November 2013, about **40% expects the permit granting procedure to last longer than the 3.5 years period set by Regulation (EU) No 347/2013**[31].

Figure 6 - Duration of the permit granting process for electricity PCIs



For further details on the projects, which are delayed or rescheduled and the main reasons for their delay or rescheduling, please refer to Annex IV.

[30] The assessment includes 21 projects, which first applied for permit granting before 16 November 2013 and 57 projects which first applied after 16 November 2013.

[31] According to Regulation (EU) No 347/2013, for these projects Chapter III of the Regulation (Articles 7-10) regarding permit granting and public participation applies and provides a legally binding 3.5 years upper limit with a potential extension of maximum 9 months for the permit granting process.

Key findings and recommendations

- The Agency notes an overall progress in the PCI implementation. **3 PCIs were commissioned and 19 indicated progress** in their status over the last year.
- The Agency notes that only 2 PCIs reported no activity over the last year, which is a significantly reduced number compared to previous years. The Agency reiterates its view that **Regional Groups should scrutinise the activities performed by each PCI and the reasons for any non-performance, when considering the applications of current PCIs to maintain such a status.**
- **Most PCIs (63%) are on time (or even ahead), while 25% is delayed and 12% is rescheduled.** The most frequently mentioned reason for delay is still related to permit granting. The most common reason for rescheduling is related to the preliminary nature of the concerned projects followed by the project's deprioritisation against other project.
- The Agency is of the view that **there is a significantly different level of uncertainty accompanying the evolution and implementation of projects under consideration and projects which are planned to be commissioned beyond 10 years, which feature should be clearly flagged in the PCI list.**

2.4 Progress of costs and benefits

2.4.1 Investment costs

Last year, promoters were not requested to provide new forecasts of the PCIs total investment costs, since these figures were confirmed during the PCI selection process, which preceded the monitoring exercise only by a few months. Therefore, the figures considered in the 2017 PCI selection process were used to monitor costs, with additional specific data from the project promoters, where required[32]. This year, project promoters were requested to report the investment costs only in case of changes compared to last year. Where the project promoters did not indicate any change, last year's investment cost values were used for the purpose of this Report[33].

The total amount of the expected investment costs for 89 PCIs in 2019 values[34] is **€49.5 billion (€40.4 billion for transmission projects, €8.7 billion for storage projects and 0.4 for smart grids)**[35].

[32] For more details regarding the use and calculation of investment costs for the 2018 PCI monitoring, please refer to the Agency's consolidated report on PCIs in 2018.
[33] Where project promoters reported no change in the investment costs while the commissioning date of the project has changed, the Agency adjusted the investment costs for the statistics taking into account the new commissioning year, as those values were previously provided at the value of the previous commissioning year and the project promoters were requested to indicate no change if the difference in the value was purely due to discounting to different year.
[34] The investment cost figures considered in the PCI selection were real values, which referred to the year of the commissioning, therefore the sum was calculated after discounting all costs to 2019 values to make them comparable.
[35] For the total investment costs' figure the available data included 72 transmission, 13 storage, and 4 smart grid PCIs. In the cases where an aggregate value was available at a cluster level containing more than one PCI with different commissioning dates, for simplicity the cost was split evenly among the different dates.

Based on the investment costs of 82 projects for which both 2018 and 2019 data are available (i.e. 65 transmission, 13 storage and 4 smart grid), the Agency notes that 40% reported changes in the expected investment costs and the overall increase in the total expected investment costs is about +2%[36]. The vast majority of these projects are in the permitting or under construction stages.

The Agency notes that out of these projects, 40% reported lower expected investment costs, on average of -15%, in 2019. The most common reported reasons for these changes are a better cost estimation and changes in the project scope or technical characteristics (about one third each). At the same time 60% reported higher expected investment cost in 2019; for those projects the average increase is about +35%. For almost half of them the reasons for the changes provided by the promoter is a better cost estimation or price changes in the material or equipment used for the project. The Agency notes that cost estimates (in particular) at early stage of implementation are subject to uncertainties, and better cost estimations result in upward or downward variations of the investment costs figures over time. Based on the Agency's findings, these variations tend to be asymmetrical, as more projects report increase with respect to the previous estimates of investment costs and the average increase is higher than the average decrease.

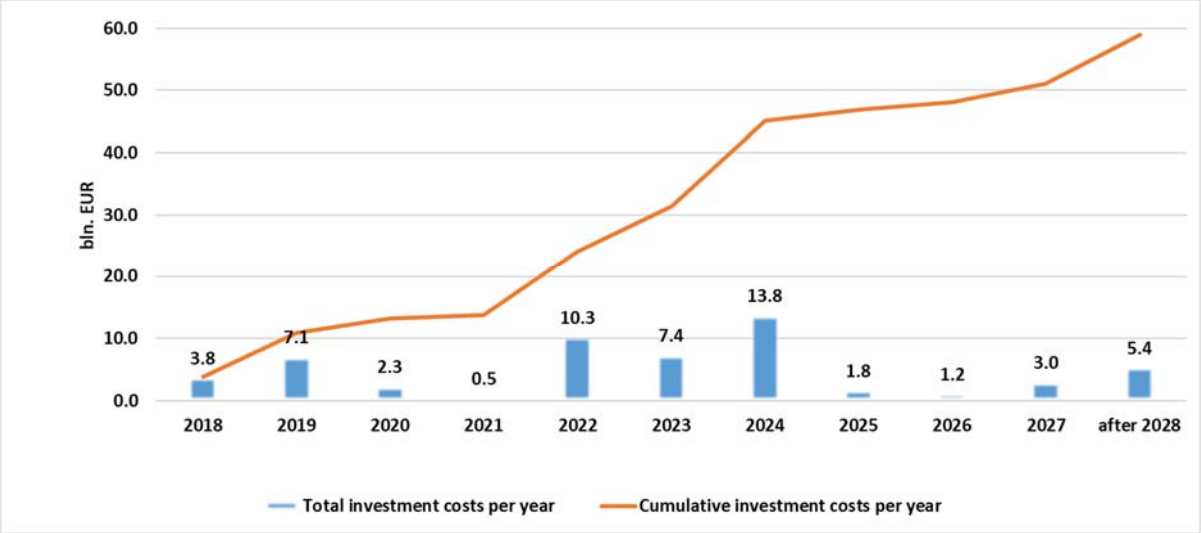
For specific information regarding the investment costs of the projects, please refer to Annex IV.

Expected investment costs over the coming years[37]

Figure 7 shows the distribution of the expected investment costs over the coming years (at real values at the commissioning date). It can be inferred that, **if projects were implemented as planned** and if the indicated commissioning dates were met, more than **75% of the total investment costs would have to be incurred** within 5 years (i.e. by 2024).

[36] For those 82 projects the total investment cost expected was of €48.2 billion in 2018 and €49.1 billion in 2019.
[37] For the purpose of this assessment, the Agency used the conservative assumption that 100% of the indicated investment costs are realised in the year preceding the commissioning of the project to provide a view of the scale of expected investment needs, which would appear by certain years if all PCIs were implemented as planned.

Figure 7 - Total investment costs of electricity PCIs



Actual spending

Tracking the actual level of spending until now provides a useful insight into the progress of PCIs. Similar to last year, the Agency invited promoters to report the total amount of capital costs spent on the project until the end of 2018. The total amount incurred by 2018 was about **€8.4 billion** (i.e. out of this sum, about 2 billion in 2018), representing 14% of the overall PCIs budget, and, in addition, **€3.5 billion were contracted**[38].

2.4.2 Life-cycle costs

During the 2018 PCI monitoring, transmission promoters were not requested to provide new forecasts of the project lifecycle costs, but the values considered for the 2017 PCI selection process were used for the monitoring. Regarding the storage and smart grids projects, the annual lifecycle costs were requested to promoters (including, for storage, the annual costs of power purchase needed for the operation of the plant reported as a separate item), since they were not available in the PCI selection process. This year, project promoters were requested to report the life-cycle costs only in case of changes compared to last year. Where the project promoters did not indicate any change, last year's investment cost values were used for the purpose of this Report.

Due to the small number of storage projects, and considering also the diversity of the storage technologies employed, and the concerns about the comparability of the data, the assessment of the life-cycle costs focuses on the transmission PCIs only.

Project promoters reported changes regarding the life-cycle costs for 21 transmission projects (about 20%). Out of the 12 PCIs for which the information was available in both years (i.e. 2018 and 2019), costs increased for 6 PCIs, with a great variation (e.g. with increases ranging

[38] The "Additional Contracted Investment Costs" include all the costs which promoters are committed to (e.g. tender and consequent contracts are signed, even if no invoices are issued yet or no payments are made yet) excluding the Incurred Investment Costs.

from 3% to more than 200%), and decreased for the 6 other PCIs. The reasons for these changes are not available to the Agency.

The Agency notes that aggregate expected life-cycle costs[39] for the transmission PCIs (in 2019 values) correspond to 15.3% of the total investment costs of the same project sample: i.e. 63 projects, for which sufficient data was available. This rate confirms the Agency's previous relevant findings.

2.4.3 Expected benefits

During the 2018 PCI monitoring, project promoters were not requested to provide updated benefits forecasts, and the figures considered in the 2017 PCI selection process[40] were used to monitor PCI benefits[41].

For this year's monitoring, the project promoters were requested to provide the Agency with information regarding benefits only in case of changes in the values compared to last year. Updated information was provided for 32 PCIs. For 8 of them (25%), the changes in the benefit figures were due to the reassessments within the EU TYNDP 2018, which applies the 2nd ENTSO-E CBA guideline and identifies additional benefits. For 6 projects (18%) the changes were due to different benefits being identified, or to disagreement with the benefits calculated in the EU TYNDP, and for 5 projects (16%) the project benefits were expected to increase following the entry into force of the "Clean Energy Package". In the remaining 13 instances (41%), the project promoters did not provide an explanation for the changes of the benefits of the project.

[39] The lifecycle costs of each project was calculated based on the annual OPEX reported by the project promoter. The present value (2019) of the annual lifecycle costs was calculated, applying the CBA rules and starting from the year of commissioning.

[40] It is noted that, in this analysis, the benefits considered in the 2017 PCI selection were taken into account, i.e. the ENTSO-E TYNDP 2016 results for vision 3 and 4 and additional benefits reported by promoters and assessed by the Regional Groups.

[41] The benefit calculation included 76 transmission PCIs (for which lifecycle cost data was also available), all storage projects, for which both investment costs and benefits data were available, and no smart grid projects since monetised benefit data was not available for them. 5 transmission PCIs could not be considered in the analysis as benefits were available at a cluster level, which, however, included more investment items than the PCIs. For the rest 9 PCIs benefit calculations were not available in the EU TYNDP 2016, and were not considered in the 2017 PCI selection process. Regarding the calculation of benefits, the following steps were followed during the PCI selection process:

- The total benefits of each project were calculated for scenarios 3 and 4 of the TYNDP, taking into account the two time horizons studied in the TYNDP (year 2020 and 2030) and by applying the interpolation rule stipulated in the CBA methodology. The monetised benefits taken into account were the following:
- The TYNDP indicator Social Economic Welfare (SEW).
- The additional benefits indicated by project promoters either in the TYNDP or during the PCI selection process.
- The monetised value for losses.
- The above calculated benefits figure was assumed to be materialised annually during the life time of the project (i.e. 25 years), starting at the commissioning year, and was discounted to 2017 value.

Key findings and recommendations:

- The total amount of expected investment costs is about €49.5 billion and it shows a slight (about 2%) increase compared to last year.
- The Agency notes that while cost estimates (in particular) at early stages of implementation are subject to uncertainties, the later adjustments tend to be asymmetrical, as more projects report increases with respect to the previous investments costs and the overall investment costs also appear to show an increasing trend over time. **The Agency recommends project promoters to apply more balanced cost estimates of the projects and to provide the expected variations of investment and life cycle costs estimates of the project in their data submission related to TYNDP and PCI activities.**
- The total life-cycle costs for transmission PCIs amount to approximately 15.3% of the total investment costs of the same project sample.
- Promoters reported to have spent €8.4 billion on the current PCIs by the end of 2018 and expect that more than 75% of the overall projects' budget should be incurred in the coming 5 years. The Agency maintains its previous view that this planning is too optimistic based on past progress.

2.5 Regulatory treatment

The Agency reviewed the application of the two regulatory tools introduced by Regulation (EU) No 347/2013, namely the coordinated decisions on the investment requests and specific incentives in case of higher risks, as well as the exemptions provided by Regulation (EC) 714/2009. As these tools are applicable only for transmission projects, storage and smart grid PCIs are not considered in this chapter[42].

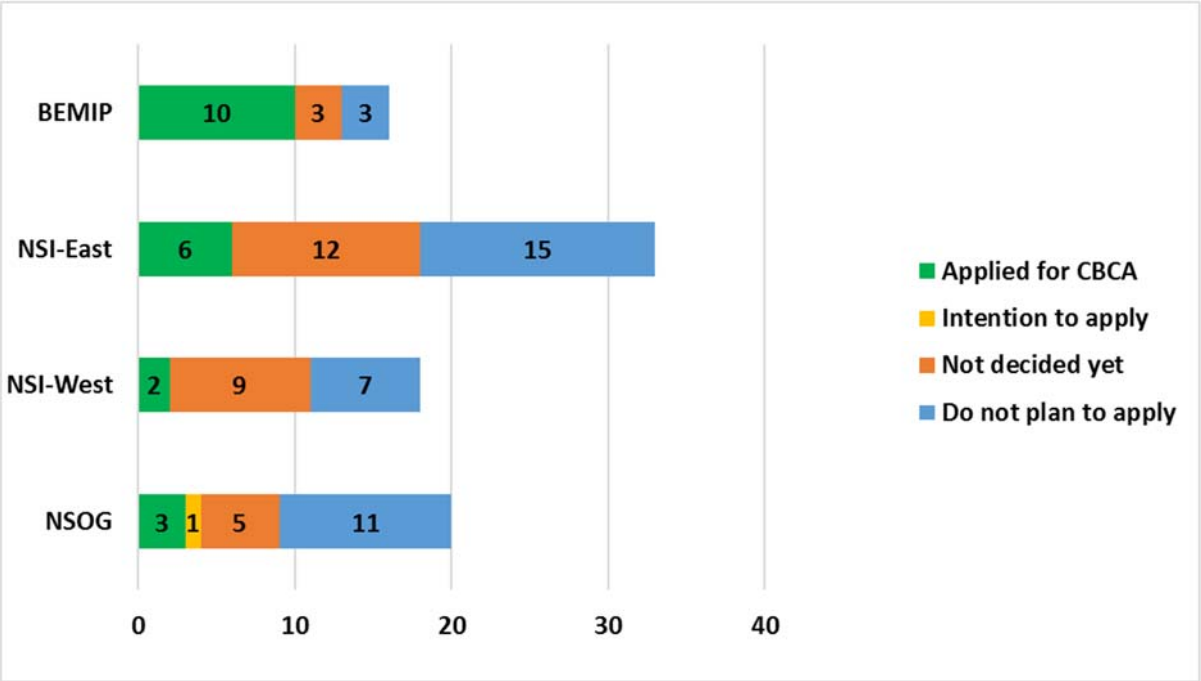
2.5.1 Investment requests and decisions

The Agency identified 21 electricity PCIs in the 2017 PCI list for which project promoters submitted an investment request pursuant to Article 12 of Regulation (EU) No 347/2013[43]. In 17 out of the 21 cases, the PCI received a cross-border cost allocation (CBCA) decision, while, for the remaining 4 PCIs, the decision process was still ongoing at the time of submission of the PCI report. Regarding future applications, 1 additional project promoter is considering to submit an investment request and 29 project promoters have not decided yet. The Agency notes that most investment requests have been submitted in the BEMIP priority corridor.

For more information regarding CBCA decisions on PCIs in the past, please refer to the Agency's separate reports available on the Agency's website[44].

[42] The Agency included in the assessment only the non-cancelled transmission PCIs.
[43] The number of investment requests are lower as for some PCIs belong to the same cluster the project promoters submitted joint investment request.
[44] Agency's summary report on CBCA decisions (March 2018)
https://www.acer.europa.eu/Official_documents/Acts_of_the_Agency/Publication/Third%20Edition%20of%20the%20Agency%27s%20Summary%20Report%20on%20Cross-Border%20Cost%20Allocation%20Decisions%20-%20Status%20update%20as%20of%20March%202018.pdf
Agency's overview of CBCA decisions (December 2018)

Figure 8 - Investment request per priority corridor[45]



2.5.2 Risks and incentives

Pursuant to Article 13(5) of Regulation (EU) No 347/2013, Member States and NRAs are required to provide appropriate incentives for PCIs deemed to incur higher risks as compared to the risks normally incurred by comparable infrastructure projects. The Agency notes that none of the PCIs in the 2017 Union PCI list applied for project-specific risk-based incentives pursuant to Article 13(1) of the same Regulation. However, the Agency notes that in 9 instances the project promoters applied for non project-specific incentives that in the Agency's view have been considered mistakenly as "Article 13 incentives" by the project promoters (e.g. the Cap and Floor regime[46] in Great Britain and incentive regulation on the use of interconnection in France). In 3 additional instances, the project promoters plan to apply for specific incentives and in 38 instances, the project promoters have not decided yet whether they intend to apply in the future for project-specific risk-related incentives or not.

For more information regarding project-specific risk-based incentives granted for PCIs in the past, please refer to the Agency's separate report available on the Agency's website[47].

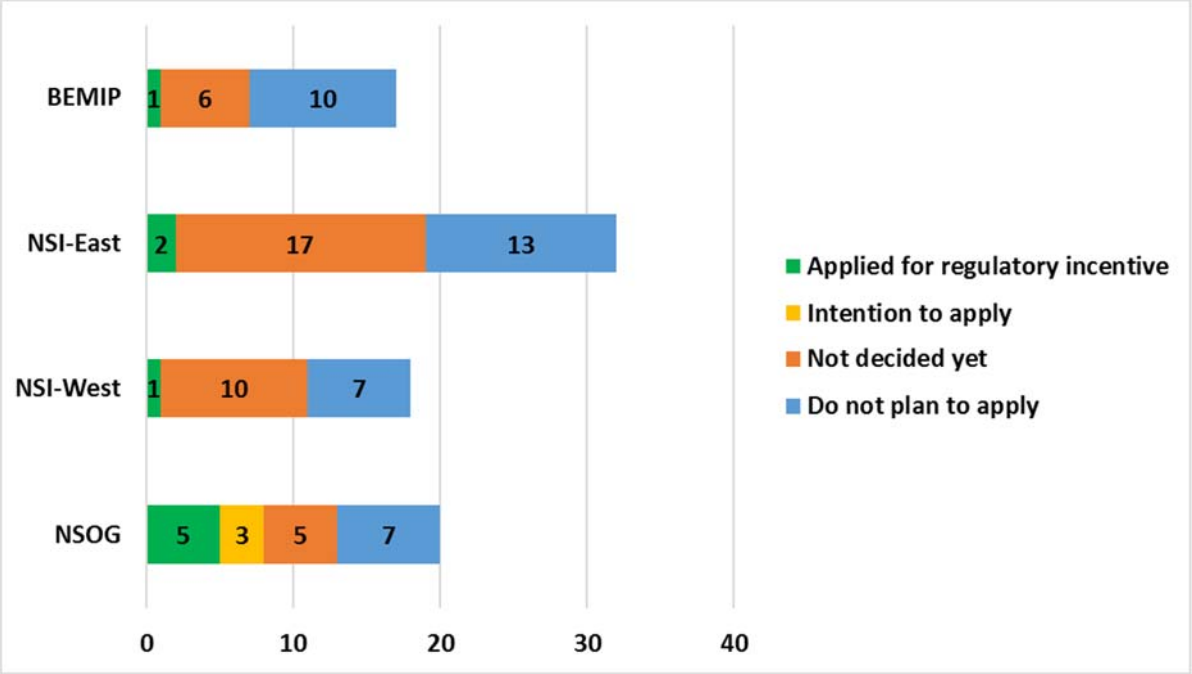
https://www.acer.europa.eu/es/Gas/Infrastructure_development/CBCA-decisions/Documents/20181231-Overview%20of%20CBCA%20decisions.pdf

[45] The information was available for 87 transmission PCIs.

[46] 3 PCIs applied in the United Kingdom's "Cap & Floor" regulatory regime. It is noted that the cap and floor regulatory regime is designed to consider and reflect the costs and risks of new subsea electricity interconnectors, although PCI status is not a precondition for approval under the regime (and as such the tool is not specific to PCIs).

[47] Agency's summary report on project-specific risk-based incentives, September 2018.

Figure 9 - Applications for regulatory incentives per priority corridor[48]



2.5.3 Exemptions

Under specific circumstances, NRAs may provide a full or partial exemption of projects from Article 16(6) of Regulation (EC) No 714/2009, from Article 32 and Article 37(6) and (10) of Directive 2009/72/EC, pursuant to Article 17 of Regulation (EC) No 714/2009, or under Article 7 of Regulation (EC) No 1228/2003, which are basically exemptions related to third-party access.

As shown in Figure 10, there are 4 PCIs in the 2017 PCI list for which the project promoters applied for an exemption[49], out of which 3 have received such exemptions from the NRAs[50] while in 1 instance no exemption has been granted[51]. 2 PCIs intend to apply for exemptions in the future and 24 have not decided yet. Most exemptions have been applied in the NSOG priority corridor.

https://www.acer.europa.eu/Official_documents/Acts_of_the_Agency/Publication/ACER-summary-report-on-project-specific-risk-based-incentives_2018.pdf

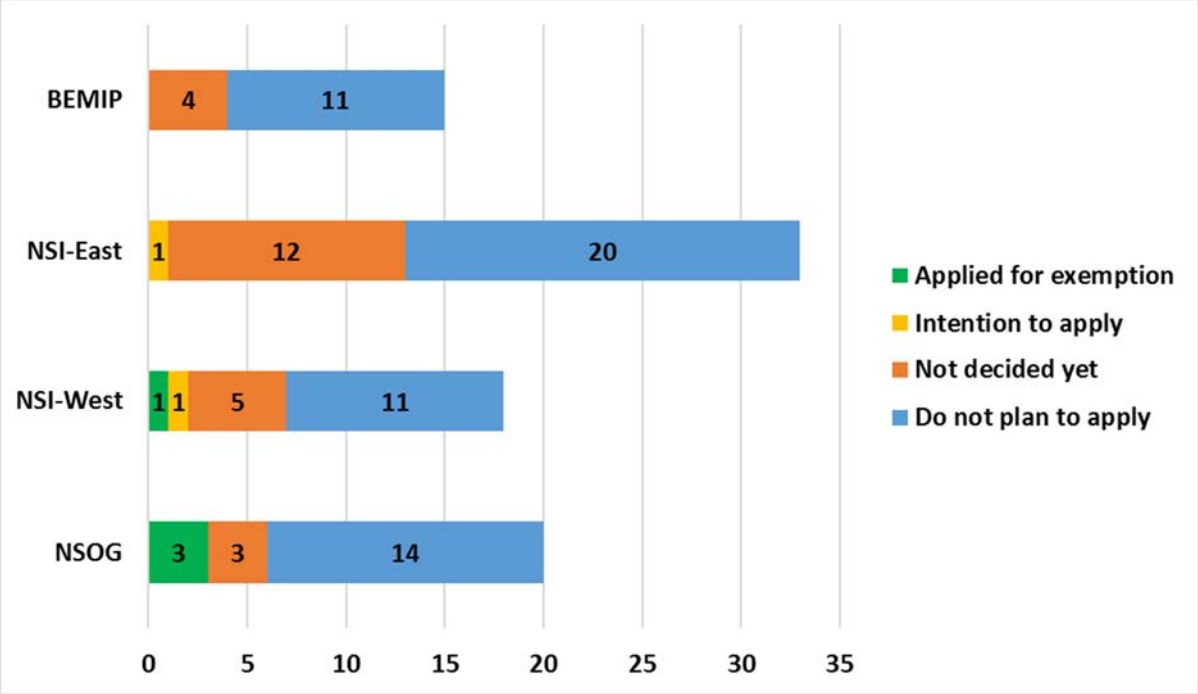
[48] The regulatory incentives presented in the chart includes not only project-specific risk-based incentives pursuant to Article 13(1) of Regulation (No) 347/2013, but also the non project-specific incentives have been considered mistakenly as 'Article 13 incentives' by the project promoters.

[49] Exemption has been also reported for PCI 3.22.5. However, the Italian NRA informed the Agency that the project received an exemption from some provisions pursuant to Italian Ministerial decree 21 October 2005 on merchant lines, but not an exemption under Article 17 of Regulation 714/2009.

[50] PCIs 1.7.3 'ElecLink', PCI 2.5.1 'Savoie - Piemont' (only related to the Italian side) and PCI 1.10.2 'NorthConnect' (in Norway under Article 7 of Regulation (EC) 1228/2003).

[51] PCI 1.7.4 'AQUIND'

Figure 10 - Applications for exemptions per priority corridor



Key findings and recommendations:

- Exemptions and the regulatory tools of Regulation (EU) No 347/2013 (project specific risk-related incentives, investment requests including requests for cross-border cost allocation) have not been widely used by project promoters and project promoters have shown a limited interest to use them in the future.

3 Volume 2: GAS PROJECTS

3.1 Introduction

3.1.1 Fulfilment of the reporting obligations

In 2019, the Agency continued using the online information support system known as "VALVE" to collect reports from promoters. The system's interface allows promoters to access VALVE remotely via an on-line tool[52]. The system was pre-filled with the information submitted by the promoters for the 2017 TYNDP[53] and with updates from the 2018 PCI monitoring exercise. Promoters could confirm that the information is valid or provide an update.

The 2017 PCI list includes 53 gas PCIs, which consist of 98 investment items. The Agency collected information at the level of each investment item and then converted and aggregated the data (if applicable) to PCI level. In this Report, the monitoring results are presented at PCI level.

By the legal deadline of 31 March 2019, the Agency received full reports for 50 out of the 53 PCIs[54]. The reports for 2 PCI[55] projects were submitted after the legal deadline, and for 1 PCI[56] no complete report was submitted.

The Agency stresses that promoters are under a legal obligation to submit an annual report for each PCI each year following the year of inclusion of the project in the PCI list. Failure to submit such a report represents a breach of the promoters' obligations under Regulation (EU) No 347/2013.

3.1.2 Completeness, consistency and adequacy of the submitted data

The Agency checked the submitted data in order to assess their completeness and consistency. The Agency notes that the **information related to project identification, technical parameters and expected total investment costs appears to be adequately provided.** However, **the Agency identified a significant number of cases in which sections of the reporting template were not completed**[57].

Most of the missing or incomplete information is related to the expected **benefits** to be delivered by the projects. While promoters did consider the category of applicable benefits for each PCI and provided certain information, the estimated monetised value of benefits was provided only for 6 PCIs, the same number of projects as in the 2018 monitoring exercise. Similarly, **project life-cycle cost data are missing or incomplete for 74 investment items (out of 93) which represents 68% of the PCIs**. Project promoters seem to have difficulties to identify or report these data, even though a project cost-benefit analysis (CBA) was carried out already at the stage of preparation of the 2017 PCI list. The Agency notes that this year, once again, **most of the missing data are related to life cycle-costs and monetised benefits**.

[52] In the future, the information support system will also cover electricity projects.
[53] Cf. https://www.entsog.eu/publications/tyndp#ENTSOG-TEN-YEAR-NETWORK-DEVELOPMENT-PLAN-2017
[54] In this volume of the Report, the focus is on gas PCIs. Here, "all PCIs" refers to all the gas priority projects only and not to any electricity PCIs, unless otherwise indicated.
[55] PCI 6.10 Gas Interconnection Bulgaria – Serbia, PCI 8.3.2 (Mirror) Baltic Pipeline (DK part).
[56] PCI 7.1.1 South-Caucasus Pipeline Future Expansion (SCPFX) investment item input is missing
[57] The Agency recalls that the exact elements of the promoters' reports are not prescribed in Article 5 of Regulation (EU) No 347/2013. So far, for each PCI monitoring exercise, the Agency compiled reporting forms, after consulting them with the Competent Authorities, the NRAs and the project promoters, which were used to collect the information.

Due to certain inconsistencies in the reported data, the Agency contacted the promoters of 12 PCIs and requested verification of the submitted data. In the majority of these cases, the requests addressed apparent changes in the CAPEX figures and total investment costs compared to the status as of January 2018 and/or the lack of an adequate explanation for such changes.

In 4 cases the Agency requested a review of the project implementation status. Some PCIs foresee implementation in several project 'phases', which can be consecutive (e.g. different sections of a pipeline to be built one after the other or installing compression power in stages at a compressor station), or in parallel. Regardless of the implementation order, phases are essentially different implementation stages of a project. Each "phase" of the same PCI may foresee different commissioning dates, and be individually implemented on time or be postponed. While the information in this Report is generally aggregated and provided at PCI level, the relevant sections of this Report indicate whether the submitted reports at investment item level show inconsistencies with other parts or items of the same PCI.

Key findings and recommendations

- Once again this year, the Agency notes that most project promoters apparently continue to experience difficulties in assessing and reporting the value of the project life-cycle costs and, even more, the monetised benefits associated with their projects. The Agency recalls its view that, since all PCIs are subject to CBA already at the stage of preparing the PCI list, the lack of any estimate of the value of a project's expected life cycle costs and benefits casts fundamental doubts on the projects merits[58].
- The Agency reiterates its recommendation that project promoters evaluate the costs and benefits of their projects from the inception of the project and track the progress of the costs and benefits over the entire project cycle.

3.2 Overview of the gas PCIs

3.2.1 General statistics of the PCIs

The 2017 PCI list includes 53 projects in gas, mostly in transmission (42 projects), but also 5 liquefied natural gas (LNG) regasification projects and 6 underground gas storage (UGS) projects.

For one PCI the information is incomplete this year due to one project promoter failing to report[59].

[58] The Agency provided an opportunity to the project promoters to mark cost and benefit data as confidential, should promoters wish to do so. Nevertheless, very few promoters provided information about benefits and most also did not provide data for life cycle costs.

[59] For PCI 7.1.1, the complete information is not available this year, due to non-reporting of South-Caucasus Pipeline FutureExpansion (SCPFX) investment item belonging to this PCI.

The Agency notes that, in two cases, the same investment item has been included in two PCIs, which can cause double counting. Therefore the data attributed to common items is considered only once in this Report[60].

The Agency recalls its recommendation that no PCI is listed on the PCI list or reported as part of another PCI, and that codes are uniquely assigned to individual PCIs (cf. PCI 5.5.1 and PCI 5.5.2)[61].

Since the projects in the 2017 PCI list were monitored in 2018, the distribution of gas PCIs by type and corridor is this year the same as already presented in the Agency's consolidated report on the progress of electricity and gas PCIs in 2018 (p. 27)[62].

Major changes and works performed during the last year were reported mostly for transmission projects. Project promoters reported **major technical changes** for 11 projects, i.e. for 21% of all gas projects in the 2017 PCI list. Since there is no exact definition of the notion of a "major technical change", the reported cases of "major technical changes" reflect the project promoters' own judgement. In general, "major technical changes" are commonly due to changes in the scope of the project, i.e. to the addition or removal of some investment items or sub-projects. Other types of major changes include changes in the technical and technological features of the infrastructure or in the auxiliary equipment, including downsizing or increasing the planned capacity. New routing and siting were also reported as major technical changes.

3.2.2 Presence of the PCIs in the NDPs

The Agency notes that NDPs typically include the national sections of cross-border gas transmission projects. However, NDPs – as a rule – do not consider the cross-border aspects or effects of LNG or UGS projects located outside their geographical scope. Not all LNG or UGS projects present in the NDPs of the Member States where the projects are located may have *significant* cross-border impacts. For this reason, such projects may be absent from the NDPs of other Member States, and such absence should not be interpreted *a priori* as an inconsistency. However, the listing of an LNG or UGS project as a PCI implies that it does have significant impact in at least two Member States , and therefore LNG and UGS PCIs should be present in the NDPs with an indication of all significantly impacted Member States beyond the Member State where the project is located.

[60] As PCIs 6.2.10 and 6.2.12 include one and the same investment item (project "Poland-Czech Republic Interconnection (CZ)", TYNDP code: TRA-N-136 appears as part of both PCIs) and in order to avoid double-counting, the data of the common item is considered only once in this Report, as part of PCI 6.2.12. On the other hand, PCIs 5.5.1 and 5.5.2 overlap, since PCI 5.5.1 is actually a subset of PCI 5.5.2. In this sense, the common investment item is the entire PCI 5.5.1 within PCI 5.5.2. PCI 5.5.1 thus appears twice, once as a PCI on its own standing with an assigned individual PCI list code, and the other time as a sub-set of PCI 5.5.2.

61 In the instance, the Agency recommends de-listing PCI 5.5.1 and only keeping PCI 5.5.2, with the investment items belonging to PCI 5.5.1 included in PCI 5.5.2.

[62] https://www.acer.europa.eu/Official_documents/Acts_of_the_Agency/Publication/Consolidated%20Report%20on%20the%20progress%20of%20electricity%20and%20gas%20Projects%20of%20Common%20Interest%20for%20the%20year%202017.pdf

There are 16 investment items of PCIs absent from the NDPs of their hosting countries[63]. These PCIs include 14 transmission projects[64], 1 UGS project and 1 LNG project. Annex V of this Report lists the projects missing from the hosting countries' NDPs**.**

The following reasons for the absence of PCI investment items from the NDPs are reported:

- The NDP was prepared before the date of adoption of the PCI list, and the PCI will be proposed for the next edition of the NDP (3 instances);
- The promoter has not yet applied for a connection to the national transmission system and is thus out of the scope of the NDP (3 instances);
- The project (reported investment item) is an enabler for another project[65] (2 instances);
- No NDP exists in the country or the operators are not required to prepare and publish an NDP (1 instance);
- The project is not developed by the TSO, but by an independent developer (1 instance).

In 2 instances no reason is provided.

The Agency acknowledges that NDPs are not necessarily prepared and adopted at the same time as the PCI list, and, as projects are formulated and progress, differences could appear between the information provided in the NDPs, the data submitted when the project was a candidate for a PCI, and the data at the time when the progress report for the project was submitted to the Agency and to the relevant Competent Authorities. However, a particular form of interdependency between two or more projects (e.g., one being an "enabler" of the other) should not be considered as a reason for the non-listing of both in the relevant NDPs.

Key findings and recommendations

- The Agency reiterates its recommendation that each investment item or project component should exist only in one PCI. Having the same investment item or project component as a part of several PCIs may lead to double counting the project characteristics, and potentially to confusion in the treatment of investment requests under Article 12 of Regulation (EU) No 347/2013 and also in subsequent requests for CEF grants, as the scope of the investment associated with the relevant PCI and its costs and benefits would not be clearly defined and uniquely attributable to the PCI.
- Greater consistency is recommended in the assessment of the cross-border impacts of gas transmission (pipelines, compressor stations), LNG and UGS projects. In particular, the cross-border impacts of LNG and UGS projects should be given more consideration, on par with the consideration given to gas transmission projects.

[63] For the projects where no information was provide on the date of the first inclusion in an NDP, the Agency considered such a project as not included in the NDPs.
[64] PCI 8.1.1 (Balticconnector) is under construction, even though not in an NDP.
[65] An "enabled" project is a project which can only be implemented if an "enabler" project is implemented as well.

- The Agency reiterates its earlier recommendation[66] that consistency be pursued by ENTSOG, the Regional Groups and project promoters to the maximum extent possible with respect to the identity and scope of the projects in the TYNDP and on the PCI list, to avoid ambiguities and enable effective monitoring.

3.3 PCI status and progress

3.3.1 Current PCI status[67]

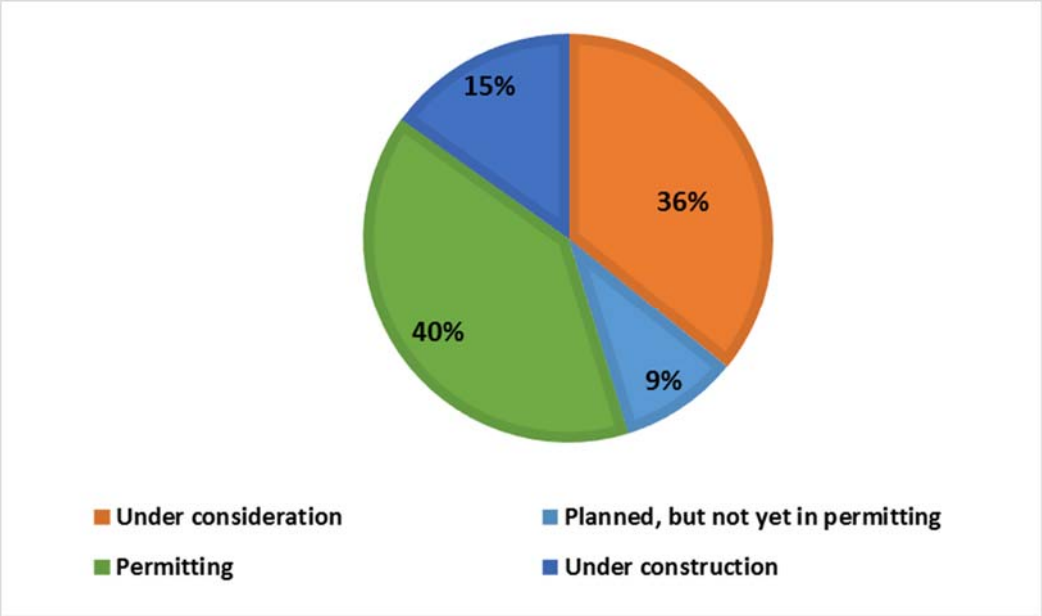
One of the main indicators of a project's progress is the advancement through implementation stages. Project promoters are requested each year to indicate a PCI's status by marking **the stage of the least developed section or part of the project** (if applicable). This information is a conservative indicator for a project's status, as some parts of the project may already be in a more advanced stage of implementation[68]. Compared to the data presented in last year's report, which referred to the same 2017 PCI list, the share of less advanced PCIs (i.e. those under consideration or planned but not yet in permitting) is lower[69] and stands at 45% of the PCIs.

Evolution of the status of PCIs in 2018-2019

In the case of 9 PCIs, progress is visible: 4 moved from "permitting" to "under construction", 3 advanced from "planned but not yet in permitting" into the "permitting" phase and 2 moved from "under consideration" to "planned but not yet in permitting". The status of one PCI[70] is registered as having moved backward or exhibiting "reverse progress", from "planned but not yet in permitting" to "under consideration", i.e. to be currently in a less advanced status than before. The status of other PCIs remained unchanged.

[66] Cf. the 2016, 2017 and 2018 PCI monitoring reports of the Agency.
[67] In order to classify the PCIs based on their status (implementation "phase" or "stage"), promoters reported by choosing one of the following pre-defined answers: Commissioned; Cancelled; Under construction; (In) permitting; Planned but not yet in permitting; Under consideration. Being "commissioned" or "cancelled" means that the PCI has completed its final implementation stage. A PCI's progress across the other stages – in the order indicated above – demonstrates an advancing maturity level of the project. In the Agency's view, a key moment in considering whether a project is sufficiently mature is the time when the promoter files an investment request. Pursuant to Section 1.2 of the Agency's Recommendation No 05/2015 regarding cross-border cost allocation (CBCA), a "sufficiently mature" project is a project exhibiting: sufficient certainty about the costs and reasonable foresight of the benefits assessed by the cost-benefit analysis, and good knowledge about the factors affecting expected costs and benefits and their ranges. In addition, permitting procedures need to have started in all hosting countries and commissioning is to be achieved indicatively within 60 months.
[68] For instance, there are 4 PCIs in the "under consideration" stage and 3 PCIs in the "planed but not yet in permitting" stage, which have components that are currently in permitting. There are also two instances where certain components are in the "planned but not yet in permitting" and at the same time other component is in the "under construction" status. Furthermore, one PCI is "under consideration", but with one component being reported as "under construction". In the case of PCI 6.8.1, an investment item has been cancelled, but the PCI as a whole continues to be developed. Thus, the overall status of the PCI may not always give a very refined view of the progress of its components.
[69] In the 2018 PCI monitoring report, the share of PCIs in less advanced stage together constituted 52% of PCIs.
[70] PCI 5.5.2 - Eastern Gas Axis Spain — France — interconnection point between Iberian Peninsula and France, including the compressor stations at St-Avit, Palleau and St. Martin de Crau [currently known as "Midcat"]

Figure 11 - PCI maturity



3.3.2 Progress of works

Project promoters were requested to indicate the **types of works and activities carried out between 1 February 2018 and 31 January 2019**.

In 2019, 7 PCIs evolved to a more advanced stage.

Among activities *related to the final phases of project implementation*, the most frequently reported types of works in 2019 relate to tendering for construction or agreements with contractors, as well as the commissioning of projects.

Among the activities related to projects that are still *in an early implementation stage*, the most frequently reported types of activities involved the carrying out of feasibility or technical studies.

In 2019, 18 promoters reported carrying out activities related to permitting, in particular the filing of requests for location permits to the competent authorities.

Other frequently reported types of activities performed during the past year are works related to front-end engineering and design (FEED, 15 promoters) and applications for financial assistance from CEF (7 instances).

The Agency compared the reported activities to the major milestones contained in the implementation schedule of the projects and their status. The Agency notes that the submitted

information is generally consistent. **Promoters indicated that no work[71] was performed in the case of 4 transmission projects[72] and 1 transmission component of an UGS PCI.** Among all the projects for which no activities were reported, 4 are located in the NSI East corridor and one in the SGC.

The Agency notes a generally positive trend in a decreasing number of PCIs for which **no work is reported**, in comparison to previous years[73]. The Agency also notes that in most of the cases where no work was carried out, the PCI is reported to be "rescheduled" to a later date, but in one case it is still reported as "on time", which does not seem very plausible.

3.3.3 Expected commissioning dates

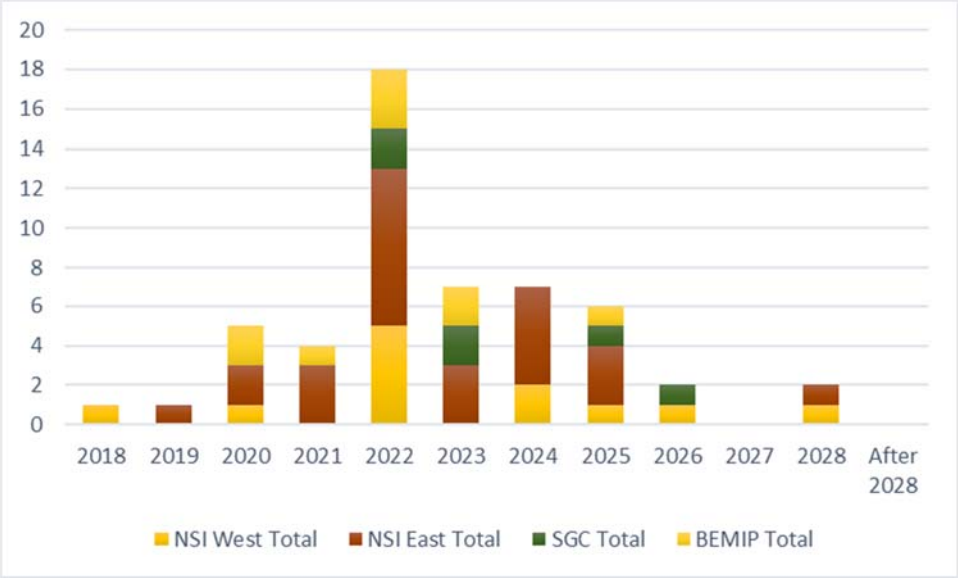
Similar to the methodology used for determining the status of a PCI, the Agency used a conservative approach to establish the expected commissioning date. **If a PCI consists of several elements, the commissioning date of the element which is to be commissioned last is indicated as the commissioning date for the entire PCI.**

Figure 12 shows the number of PCIs expected to be commissioned per year, per priority corridor. The share of projects expected to be commissioned by 2021 is modest (21%), and then it grows to a remarkable 81% by 2024, i.e. project promoters plan to construct and commission almost 2/3 of all PCIs within a three-year period (from 2022 till 2024).

By 31 January 2019 no PCI has been commissioned according to the reports, even though a commissioning date for one PCI[74] is still reported to be in the year 2018.

[71] For the purpose of monitoring the progress of the PCIs, **"work" is defined as *any* activity related to the implementation of the project**.
[72] Including three PCIs for which the promoters informed the Agency that their project is under consideration.
[73] In 2017, promoters reported 13 PCIs and in 2018 project promoters reported 10 PCIs for which no works were performed.
[74] PCI 5.11

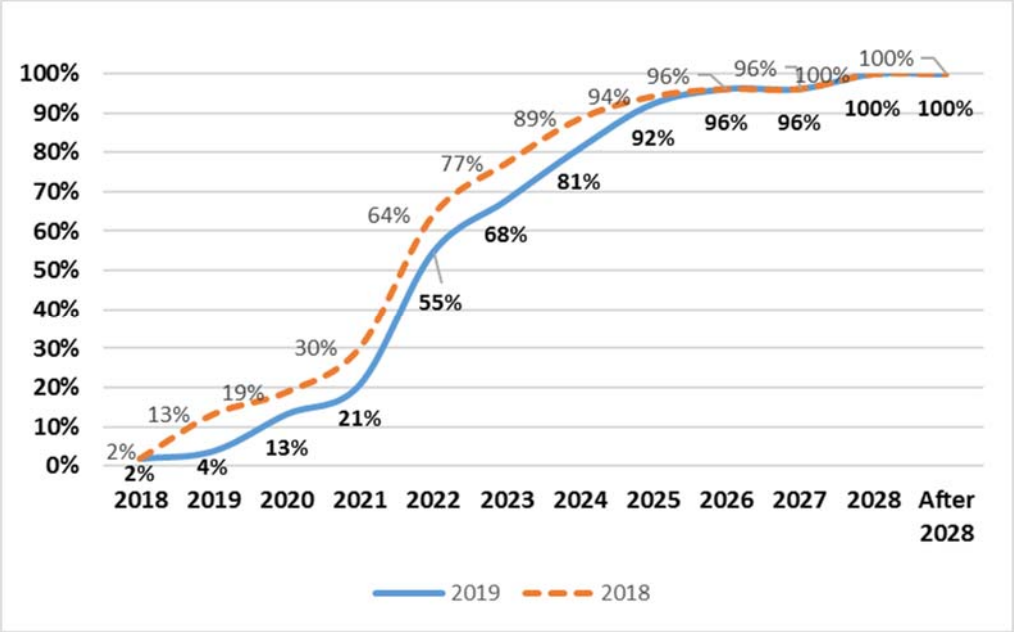
Figure 12 - Number of gas PCIs to be commissioned (per year, per priority corridor)



The Agency maintains its view that, due to the existence of competing projects and other factors such as the potential evolution of needs to be served by a project, not all PCIs will (or should) be commissioned as planned. The Agency notes that the likelihood of the majority of projects being commissioned by 2024 according to the expectations of the promoters is rather low. Figure 13 provides a comparison between indicated rhythm of commissioning as reported by the project promoters in 2018 and 2019.

The Agency notes that - if past and current reported implementation patterns continue in the future **- the commissioning dates of many PCIs are likely to be postponed repeatedly.**

Figure 13 - Cumulative share of PCIs expected to be commissioned by 2028



Changes in the commissioning dates in 2019 compared to 2018

The Agency compared the planned commissioning dates as reported by project promoters in 2018 and 2019, for all PCIs. The commissioning date has not changed for 34 PCIs. However, **for 19 PCIs it has shifted to a later date** due to delays or rescheduling, **on average by 1.5 years.**

3.3.4 Progress of PCI implementation

In each annual report, the promoters indicate whether their project is on track **compared to the commissioning date planned in the previous year**. A project is considered to be "on time" if the commissioning date is unchanged compared to that of the previous year[75]. It is instead "ahead of schedule" if the commissioning date reported this year is earlier than that reported last year,

This year none of the PCIs commissioning dates is reported to be "ahead of schedule".

A project can fall behind schedule due to either delays or rescheduling, or both. The Agency considers a project as **"rescheduled" when it is voluntarily postponed by a promoter,** as a result of changes such as lower demand, less urgent need for an investment due to updated planning data, or priority given to other infrastructure solutions. A project is considered as **"delayed" when the promoter would like to keep the expected commissioning date, but it**

[75] In three cases of PCIs 7.3.3; 8.1.1; 8.2.2 the commissioning date has been postponed but the declared PCI progress was still "on time"

cannot be delivered on time due to various external factors, such as incomplete permitting (including environmental), legislative reasons, etc.[76].

The reports submitted this year also cover individual investment items. Consequently, the information available for evaluating the progress of the PCIs is of sufficient quality in order to assess the progress of the PCIs.

Figure 14 illustrates that most of the reported PCIs (38%) are declared to be "on time", 26% are "rescheduled", and 15% are "delayed". Further, 19% have investment items which are reported to be progressing at a different pace. Such PCIs consist of investment items, some of which are "on time", while others are "delayed" or "rescheduled".

Figure 14 - Progress of gas PCI implementation

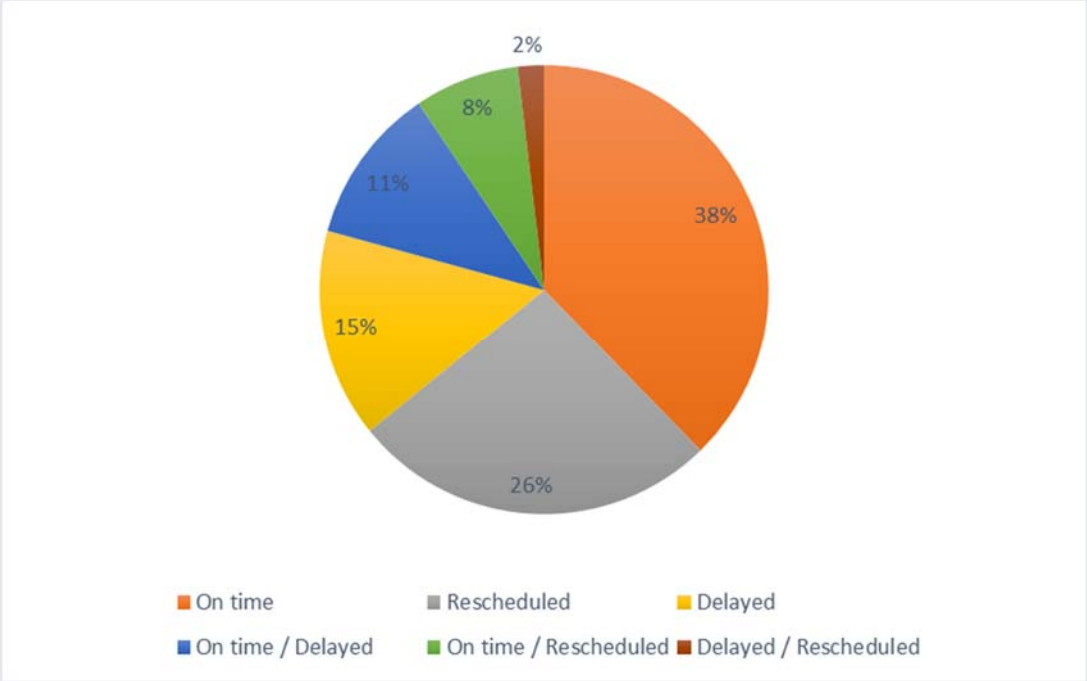
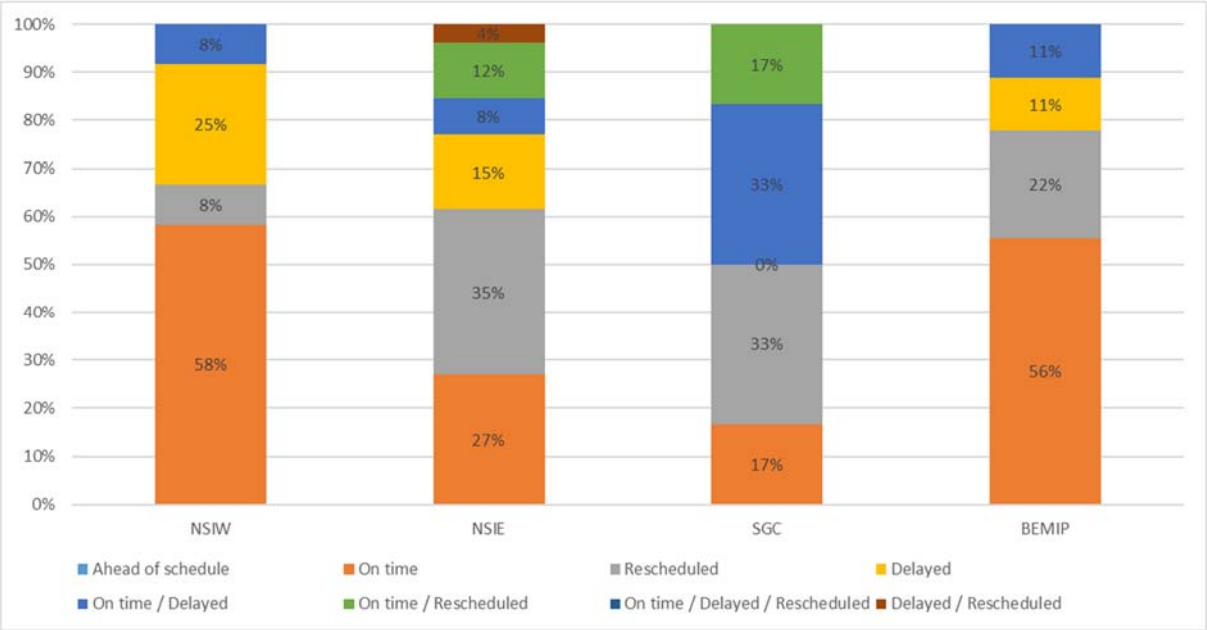


Figure 15 displays the current state of implementation per priority corridor in 2019. Among all corridors, NSI West and the BEMIP corridors demonstrate the largest share of PCIs reported to be on time (58% and 56% of the PCIs). In the NSI West corridor, only 8% of the projects are rescheduled, while in NSI East corridor and in the SGC about 1/3 of the projects have been rescheduled. The share of projects reported to be on time in the BEMIP corridor fell from 78% in 2018 to 56% in 2019.

[76] Cf. Section 5 of the Agency's Opinion No 16/2014.

Figure 15 - Current state-of-implementation of gas PCIs per priority corridor



3.3.5 Reasons for rescheduling, delays and difficulties encountered by the project promoters

Project promoters were invited to indicate the main reasons for rescheduling and delays encountered during the project implementation, using the period between 1 February 2018 and 31 January 2019 to evaluate rescheduling and delays.

3.3.5.1 Rescheduling

The number of rescheduled gas PCI projects remained the same as in 2018, and amounts to 36% of all PCIs. Since rescheduling did not always occur repeatedly for the same projects over the 2017-2019 period, but for different projects, in practice since 2016 most of the PCI projects have been rescheduled at least once.

The top reasons for PCIs rescheduling in the past year were reported as changes due to **the rescheduling of a complementary infrastructure investment** handled by another project promoter[77]**, the re-prioritisation of the project's implementation against other investments of the same project promoter[78], demand-side changes and uncertainties[79], and supply-side changes and uncertainties[80]**.

In 9 instances where the reason for the rescheduling was categorised as "**other"**, the rescheduling of the projects was due to **uncertainties in the gas market, technical issues,** or **changes** associated with the gas **demand and supply balance**.

[77] In the case of 4 out of the 19 rescheduled projects.
[78] In the case of 2 out of the 19 rescheduled projects.
[79] In the case of 2 out of the 19 rescheduled projects.
[80] In the case of 2 out of the 19 rescheduled projects.

In three cases, promoters reported several reasons for rescheduling for each sub-section of the project: for instance, the cluster Croatia – Slovenia – Austria was rescheduled due to the re-prioritisation of the project's implementation against other investments, but also because of changes due to complementarity with other rescheduled infrastructure investments handled by another project promoter.

3.3.5.2 Delays

Delayed projects account for 28% of the PCIs, practically the same share of all PCIs as in the previous year. The majority of the delayed projects – similar to the status highlighted in the Agency's 2018 report – are in the permitting[81] stage. The second most populous group of delayed PCIs consists of projects under consideration.

The reasons for delays reported by the project promoters are related to the following issues[82]:

- Correlation with other delayed infrastructure investments / tendering process;
- Environmental issues (including re-routing and/or re-siting of the facilities, problems with cultural heritage authorities or any other authority involved in the environmental procedure);
- Permit granting process.

Other reasons for delays mentioned in individual cases are:

- Financing reasons;
- Risks related to the national regulatory framework or uncertainty of regulatory decisions;
- Technological reasons.

In some cases[83], the reasons for delays as reported by the promoters seem to be causes for rescheduling (e.g. lack of market interest, demand-side changes), rather than for delays.

It seems that delays tend to happen most often during the permitting stage of the projects. However, due to the diverse responses about the timing when delays occur and the difficulties during permitting, **no definite conclusion can be drawn regarding the typical difficulties in permitting and other procedures that cause delays.**

Overall, the Agency observes that there is a general consistency in the reasons for rescheduling and delays as reported by the promoters in 2019 and those reported in 2018, although with an increasing number of promoters providing the reasons for rescheduling and delays. In 2019, all promoters who declared rescheduling and delays also provided the reasoning behind the rescheduling and the delays.

3.3.5.3 Difficulties and measures taken by promoters to resolve the delays and the difficulties

Promoters were invited to indicate the main difficulties encountered during the implementation of the PCIs, and any measures taken to resolve these delays and difficulties for those PCIs reported to be on time.

Some of the difficulties reported by the promoters for projects whose status is reported as "on time" are related to the following:

[81] 7 out of 12 delayed projects.
[82] The listing of reasons is in alphabetical order and does not reflect any priority or merit order.
[83] 2 projects out of 12 delayed PCIs.

- Permitting process;
- The concerned NRAs did not jointly agree on the investment request for the project;
- Difficulties with tender procedures (such as contract negotiations, numerous clarifications stemming from the complexity of the tender documentation, uncertainty regarding protection measures by the EU on import of steel products, mandatory explanatory rounds with bidders, final assessment of the successful bidder`s compliance with tender participation conditions, appeals against the decisions)
- Risk encountered on the geotechnical and hydrogeological investigations, which would take longer than planned.

The measures taken by the promoters to resolve the issues that caused difficulties include the following:

- Adjustments of the initial pipeline route;
- Designation of a new project promoter;
- Preparing a new permitting request;
- Seeking a third party access (TPA) exemption decision in order to set a cap on tariffs, the WACC, as well as the tariff formula;
- Requests for CEF funding or other grants;
- Requests for government support for permitting and obtaining regulatory decisions;
- Accelerated geotechnical and hydrogeological investigations.

3.3.6 Duration of implementation

The promoters were requested to provide the dates of the major project implementation milestones. In order to evaluate the duration of a PCIs' implementation, the Agency examined the **length of time** which is expected to pass **between the end of the market test and the expected commissioning date**.

For more than half[84] of the PCIs, the promoters provided dates for the market test and for commissioning, and it was possible to perform such an analysis. The results of the analysis represent only an approximate estimate of the expected duration of a "typical" PCI implementation, and the "expected duration" indicator should not be used as a benchmark that could shed light on the duration of individual projects.

For transmission projects, the typical PCI life cycle from market test to commissioning is expected to last on average **5.3 years**, while LNG PCIs are foreseen on average to reach commissioning in **7.6 years**. Only two UGS project promoters reported information for both milestones, and the expected duration for the projects' implementation is **7.5 years** (Figure 16).

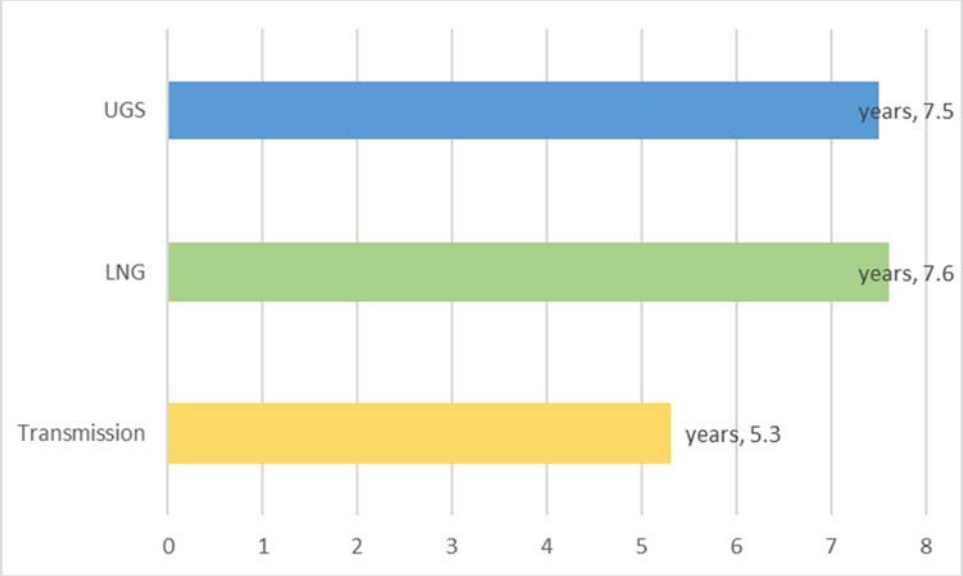
The results show a slight **year-on-year increase in the expected time that would elapse between the completion of a market test and commissioning for transmission and UGS projects[85].** Conversely, for LNG projects, the expected implementation timeframe is now

[84] 29 out of 53 PCIs
[85] On average 0.3 years increase for transmission projects and 0.5 years increase for UGS projects compared to 2018 report.

shorter (by 0.6 years) compared to 2018, but as only two data points exist for 2019, this observation cannot be considered as a trend.

Figure 16 - Average expected duration of implementation

(the typical PCI life cycle from market test to commissioning)

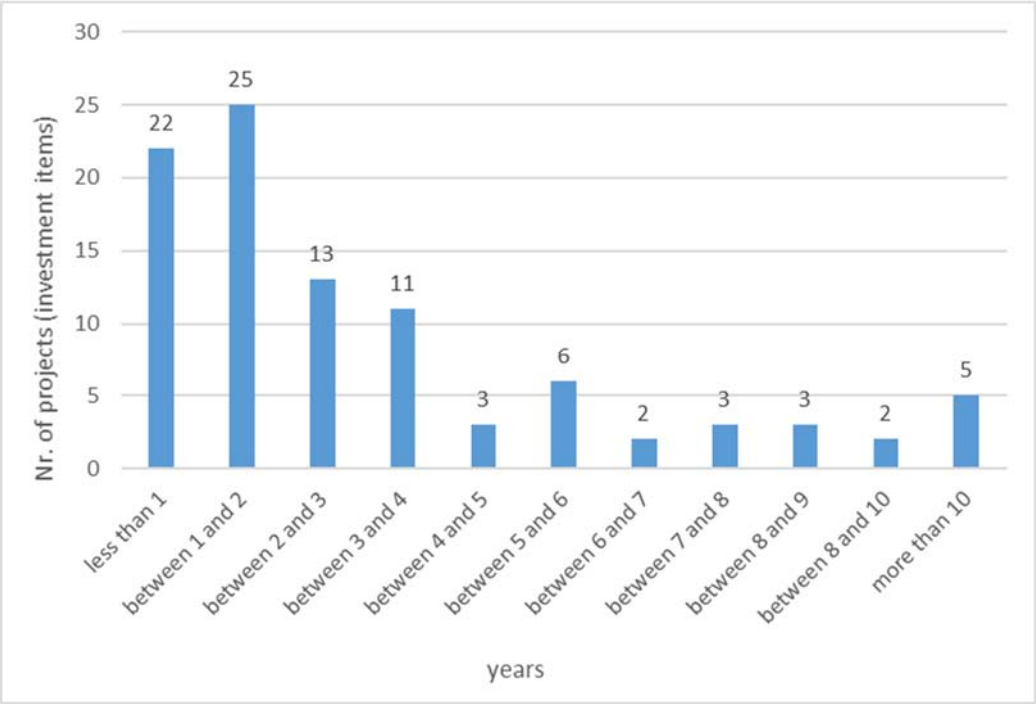


3.3.7 Duration of permitting

The Agency notes that the average duration of expected permitting, as reported by project promoters, is 3.1 years[86]. As shown in Figure 17, the expected duration of the permit granting process for approximately 65% of the projects is less than the average. However, the Agency also notes that 22% of the projects expect that the permit granting process will exceed 5 years. Moreover, there are 5 PCIs for which the expected duration of the permit granting process is more than 10 years.

[86] The assessment included 95 projects (investment items), which reported the expected overall permit granting process duration.

Figure 17- Duration of the expected permit granting process for gas PCIs



Key findings and recommendations

- The Agency notes positively that 7 PCIs indicated progress in their status from one stage of implementation to a more advanced one.
- The Agency notes that most of the PCIs have experienced rescheduling or delays over the last three years (2017-2019), to the extent that hardly any PCI can be expected to remain on the original schedule within the span of its life cycle from inception to commissioning. Despite this, most project promoters (about 70%) continue to indicate expected commissioning within 3-4 years from the moment when they provide their reports to the Agency, which looks inconsistent when compared to the pattern of rescheduling and delays or to the actual pace of project commissioning.
- The Agency highlights that no PCIs were planned to be commissioned in the lifetime of the previous (2015) PCI list and that only 2 PCIs[87] are planned to be commissioned during the lifetime of the current (2017) PCI list, i.e. in 2018 and 2019. The Agency recommends using the results of the monitoring of the progress of projects already on the PCI list in the selection for future PCI lists, to make sure that the continuous relevance and progress of projects over a longer period of time are properly considered[88].

[87] In PCI monitoring report of 2018 there were still 7 projects planned to be commissioned in the same period
[88] For example, by asking project promoters of projects which have been already included in previous PCI lists to re-confirm the validity of the project's essential features and verifying the project's progress as reported to the Agency, rather than treating such projects as entirely new and unknown ones every other year.

3.4 Progress of costs and benefits

3.4.1 Investment costs

As in previous Reports, the Agency assumed for the sake of simplicity that 100% of the indicated investment costs occur in the year of commissioning of the project[89] and assessed the scale of investment that would be made in the coming years if all PCIs were to be implemented according to the schedules reported by the promoters[90].

The indicated **total investment costs reported for all gas projects included in the 2017 PCI list amounts to €42.9 billion,** which is €0.6 billion less than the total costs reported for the 2018 PCI monitoring exercise.

Promoters indicated whether the current total investment costs match those provided by them during the selection process leading to the 2017 PCI list. Reports include instances of both **increases and decreases of the investment costs of projects**.

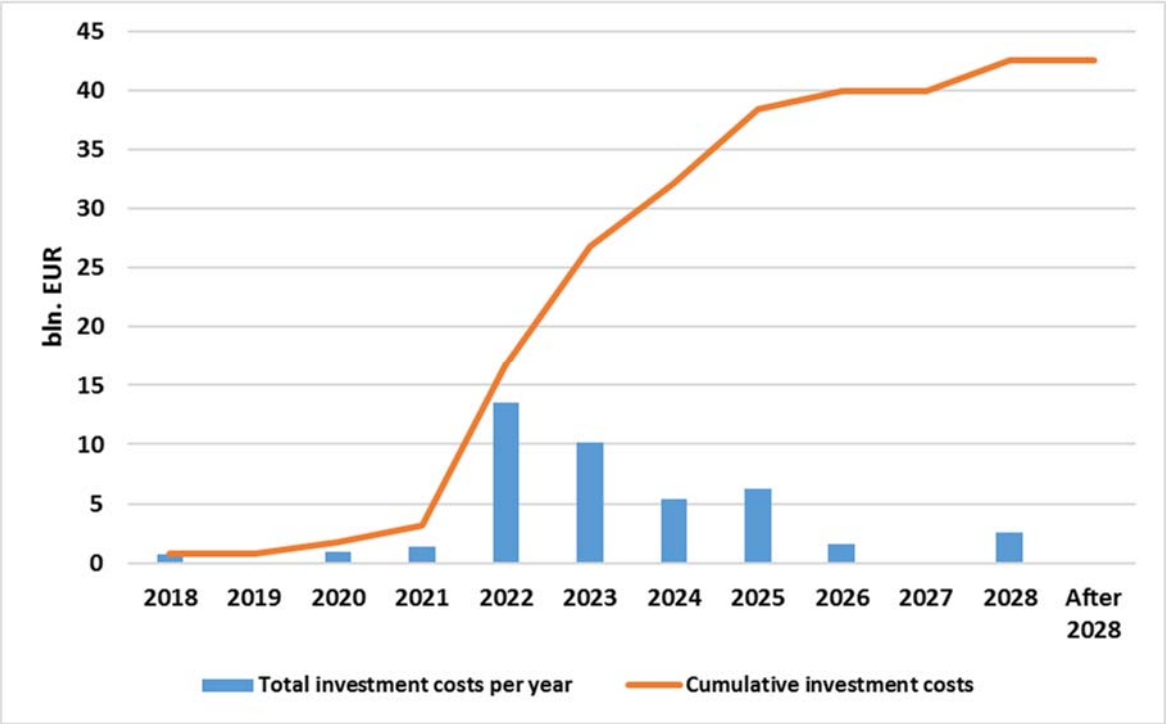
The most frequently reported **reasons for an increase in the investment costs** were the occurrence of major technical changes (e.g. changes in the routing or in the equipment needed) and the availability of a more precise budget (e.g. via studies or the recalculation of costs) (6 occurrences). Other reasons were indicated only in a handful of cases. Such reasons include changes in the project components (new investment items added or items removed from the project), additional costs encountered during the construction and an increase in the price of materials.

Regarding **decrease in investment costs**, there is only one major reason (quoted in 5 cases), namely the availability of a more precise budget developed via studies or revised cost calculations. Other indicated reasons mentioned in individual cases include technical changes, changes of the project scope and updates in the planning permit design.

Figure 18 shows that **currently promoters plan to complete investments worth €13.5 billion by 2022 and complete €10 billion more by 2023, which would mean that about 63% of the total investment costs would be incurred within the next 4 years.**

[89] In reality, most of the investment costs may be incurred already in the aftermath of tendering and during the construction period, i.e. within a much earlier timeframe.
[90] It is unlikely that all PCIs will be implemented, as the PCI list contains some competing projects, and some projects may be cancelled or abandoned. The Agency's assumption serves the aim of presenting an overall picture of the characteristics of the priority projects as reported by the promoters.

Figure 18 - Total investment costs of gas PCIs (billion EUR)



This year, the promoters indicated that the total incurred costs since the establishment of the first PCI list in October 2013, i.e. over a period of time exceeding 5 years, amounts to **€11.4 billion**, i.e. 26.5% of the total budgeted costs of the PCIs. Compared to the previous year this figure represents a €1.72 billion increase (17 %), due to spending from February 2018 to January 2019. For the investment plans actually to be carried out by 2023 as indicated by the promoters, the pace of investment would have to accelerate by 235% compared to the observed levels since 2013, which does not seem to be realistic.

3.4.2 Reported investment costs vs. reference values

The Agency compared the reported investment costs to the unit investment cost indicators and corresponding reference values (UIC) developed by NRAs and published by the Agency in July 2015[91].

The UIC reference values are based on statistics of historical costs of gas infrastructure and, where relevant, are accompanied by a brief explanation of the observed trends. For the reasons explained in the UIC report, **the indicators and the corresponding reference values should be used and interpreted with caution** and **must not be regarded as a substitute for due diligence in each instance of assessing a planned investment in gas infrastructure[92].**

The results presented in this Report are limited to the types of gas infrastructure which are more prone to standardisation (transmission pipelines and compressor stations) and for which the UIC indicators and corresponding reference values can be applied. The Report excludes UGS and LNG facilities, which may significantly vary in terms of basic physical features and other key cost-impacting parameters.

Further caution should be used as the comparison of the investment cost estimates provided by the project promoters with the UIC reference values relies on a number of assumptions, of which the main ones are listed in Annex V: Reported investment costs vs. reference values – gas

3.4.2.1 Overview of investment costs and main technical parameters

In total, 41 transmission PCIs were analysed, which corresponds to 70 projects included in the TYNDP 2017 and to 123 project sections[93].

Figure 19 shows the reported investment costs and the main technical parameters of transmission projects (e.g., the total length of pipelines and compressor power) per priority corridor. The **largest share of investment costs** for pipelines and compressor stations which are part of transmission PCIs (55% of the total) is in the SGC, slightly up from 54% in 2018. The **highest share of installed compressor power** (50% of the total) also occurs in the SGC. In terms of **total length**, out of 18,000 km of planned pipelines, 1,000 km more that in 2017, the NSI-East corridor dominates (43%), followed by the SGC (31%), the NSI-West corridor (15%), and the BEMIP corridor (11%). The figures have not significantly changed since last

[91] Cf. ACER UIC report for gas infrastructure, July 2015, see pp. 19-26 - http://www.acer.europa.eu/official_documents/acts_of_the_agency/publication/uic%20report%20-%20gas%20infrastructure.pdf

[92] One of the reasons for advising such caution is the fact that the UIC indicators and values are based on actually observed costs, while the values reported by project promoters are based on estimates and expectations. Another reason is the different time horizon of the UIC indicators and values, which are backward-looking (2005-2014 for gas transmission), while the values reported by the project promoters are forward-looking, generally for the period 2019-2027.

[93] Section defined as a change in main technical characteristics of a transmission project, such as the diameter or the pressure of a pipeline.

year, showing a general year-on-year continuity of the projects and their main technical features as included in the 2017 PCI list.

The Agency notes that the total length of planned transmission PCIs exceeds approximately three times the estimated length of pipelines which are expected to be constructed in Europe over the next few years as reported by industry sources[94]. These sources list 6,286 km of "major probable" pipeline projects in Europe, which is approximately 3,300 km less than in 2018. The Agency notes once again that, even though the industry sources limit their estimate only to "probable" pipeline projects, the total length of the planned PCIs significantly exceeds the one reported by industry sources. Moreover, the latter cover all the geography of Europe, and a broader geographic area than the PCIs. This mismatch reiterates that industry, in 2019 as in previous years, does not see all the transmission PCIs as likely to be constructed, or that some PCIs are rather immature and industry cannot realistically assess them as reasonably "probable" projects.

Figure 19 - Main technical parameters and investment costs of gas transmission PCIs

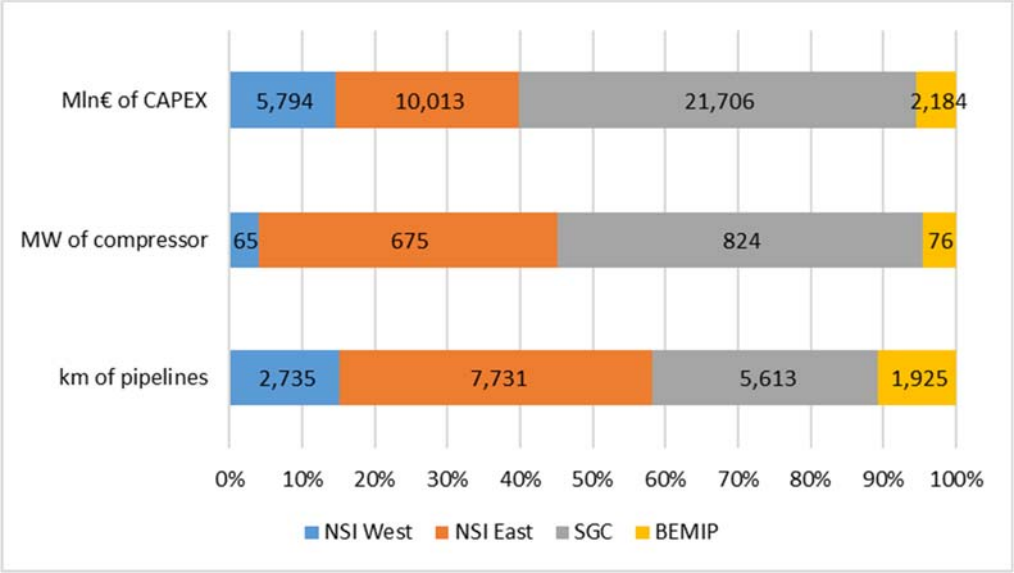
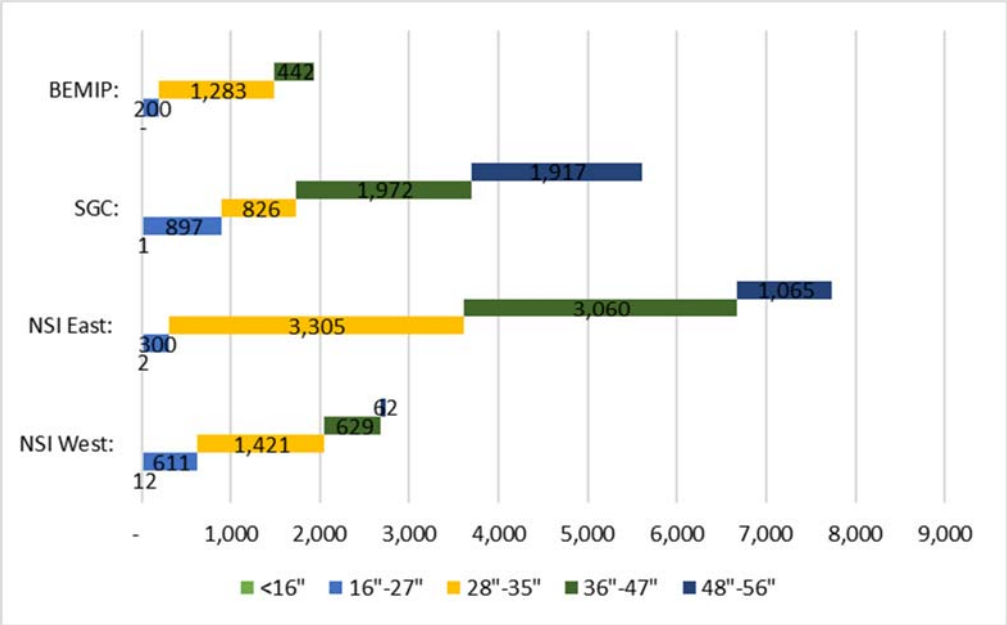


Figure 20 shows the length of pipeline PCIs, per diameter and per priority corridor. The pipeline capacity is directly correlated to the diameter of a pipeline. The highest share of high (36"- 47") and very high capacity pipelines (>=48") is in the SGC (69% of the total length of pipe in this corridor), followed by the NSI-East corridor (53%), the NSI-West corridor (25%) and the BEMIP corridor (23%). The share of medium-sized pipelines (28"- 35") is very high (67%) in the BEMIP corridor, followed by the NSI-West corridor (52%), the NSI-East corridor (43%) and the SGC (15%). Pipeline diameters have changed in some instances, but are for

[94] Cf. Oil and Gas Journal, 4 February 2019, p. 49. In Europe, gas pipeline construction in 2019 – *projects planned to be commissioned in that year* - is estimated at 1,532 miles, and beyond 2019 - *for some probable major projects whose installation will begin in 2019 or later* - at 2,374 miles. This includes gas projects of a diameter higher than 12 inches, where "**Europe" includes the regions West of the Ural Mountains and North of the Caucasus Mountains.** Conversion factor miles to kilometres: 1 mile = 1.60934 km.

most projects in line with those reported last year. As CAPEX is directly positively correlated to pipe diameter and length, it does not come as a surprise that a large share of CAPEX associated with transmission projects falls in the SGC.

Figure 20 - Length of gas PCI pipelines per range of diameter, per priority corridor (km)

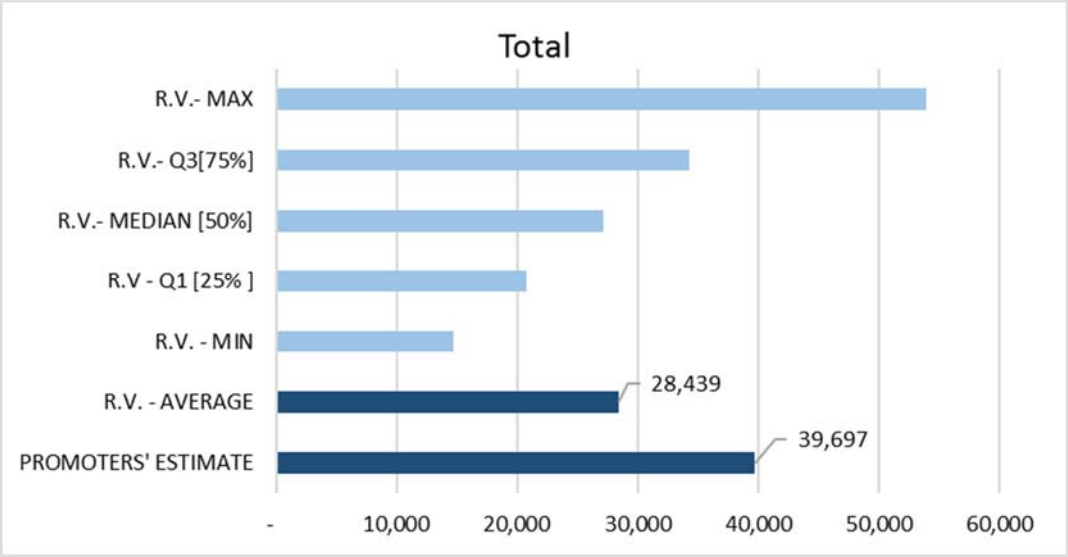


3.4.2.2 *Comparison of total reported investment costs vs. total investment costs calculated by using UIC reference values*

Figure 21 shows that the **total reported investment costs for transmission PCIs exceed the total investment costs calculated by using the average UIC reference values by 40%.** The difference between the reported costs and the UIC does not show significant year-on-year changes. The reported values are 22% over the third quartile (Q3) of UIC values, but 23% below the maximum observed UIC values. Possible reasons explaining, to some extent, such deviations from the average UIC reference values are similar to those reported last year[95].

[95] For more detail, see p.42 of the 2018 PCI monitoring report (link)

Figure 21 - Total reported investment cost vs. total cost calculated by using UIC values, gas transmission PCIs (€ million)

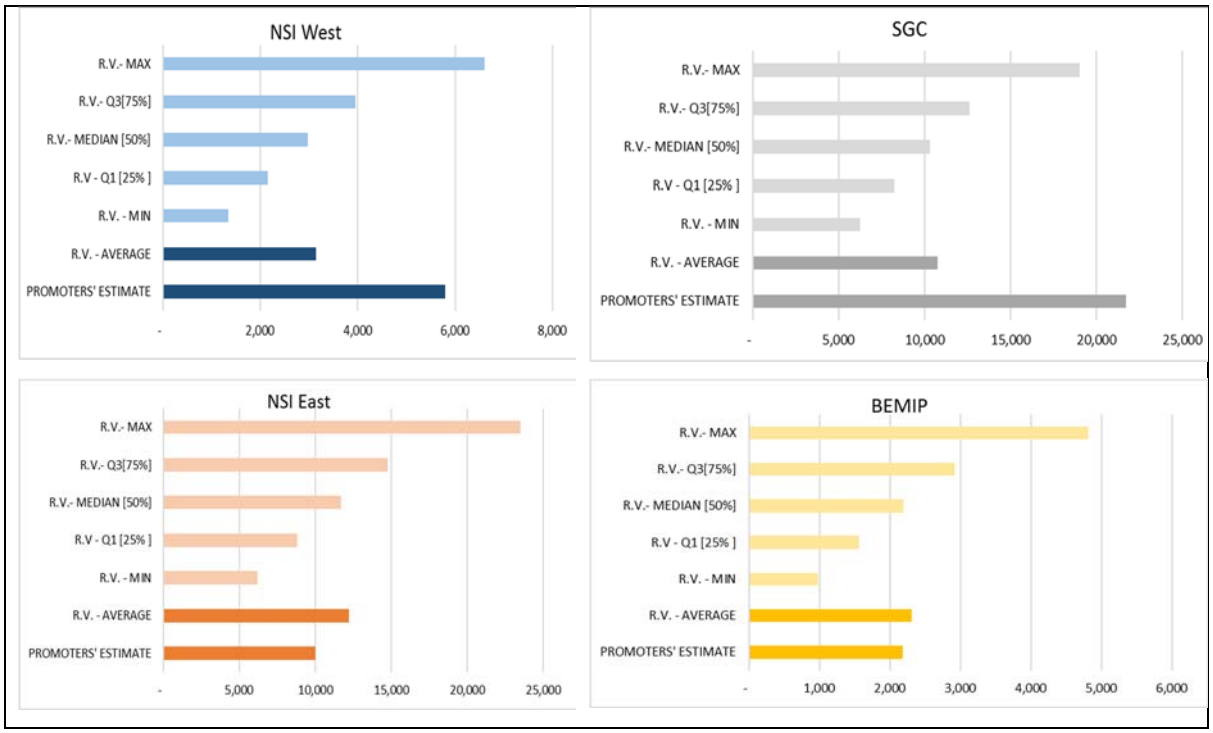


Error! Reference source not found. Figure 22 shows the results of the analysis per priority corridor and Figure 23 provides the number of PCIs reporting investment costs above or below certain reference values (average, minimum and maximum). The following differences in terms of reported estimated investment costs across priority corridors are noted.

NSI-West corridor:

- The total investment costs reported by the promoters exceed by 84% the total investment costs calculated by applying the average UIC reference values, and are slightly (by 12%) below the investment costs calculated by using the maximum UIC reference value. Approximately 67% of transmission PCIs in the NSI-West corridor are over the average UIC reference values.
- NSI-West corridor's projects appear to be more "expensive" with reference to the UIC values, which may be due to factors such as a high population density and therefore difficult routing, high density of other infrastructure resulting in the need of special crossings, and a generally higher cost of the key factors of production vs. the EU average, possibly resulting in higher labour cost. Besides, the fact that about 25% of the length of the pipeline PCIs in this corridor are to be laid offshore may also be correlated with the upwards deviation compared to the UIC reference values, which only consider onshore projects.

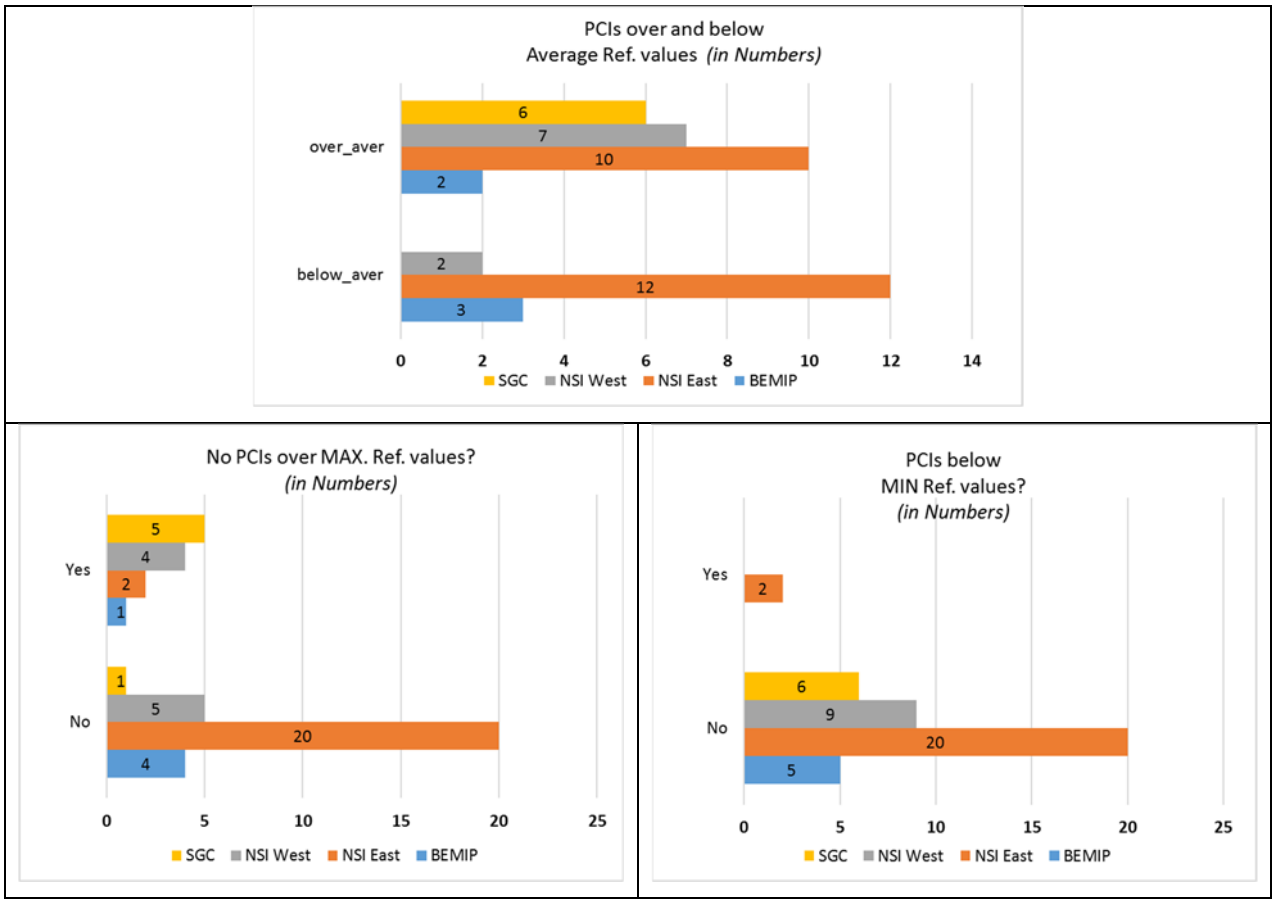
Figure 22 - Total reported gas PCI investment cost vs. total cost applying reference values (€ million), per priority corridor



NSI-East corridor:

- The total investment costs reported are 18% below the total investment costs calculated by applying the average UIC reference values, but above (62%) the investment costs calculated by using the minimum UIC reference values. Approximately 45% of transmission PCIs are over the average UIC reference values.
- NSI-East corridor's projects appear to be slightly "cheaper" compared to the pan-EU UIC reference investment cost values. The Agency notes that the lower cost of certain factors of production in some Member States vs. the EU average and the absence of offshore projects may explain this downward deviation.

Figure 23 - No. of gas PCI projects over and/or below the average, maximum and minimum reference values



SGC:

- The total investment costs reported by project promoters are approximately twice as high as the total investment costs calculated by using the average UIC reference values, and slightly over (by 14%) than the total investment costs calculated by using the maximum UIC reference values. All the transmission PCIs located in this region are over the average UIC values.
- SGC's projects appear to be "the most expensive projects" when compared to the UIC reference values. Among other factors, the complex terrain of the route of some projects and the presence of long offshore sections[96] may explain the "high cost" of some SGC 's projects in comparison to both the UIC values and to projects located in other corridors. Although the Agency finds that the reported cost of PCIs in the SGC may not necessarily be unreasonable, it advises NRAs and other authorities involved in checking

[96] More than 50% of the total length of the projects falls either partially or totally off-shore. Mostly off-shore: PCIs No: 7.3.1. (EastMed Pipeline), 7.1.4 (Poseidon Pipeline). Partially off-shore: PCIs No: 7.1.3 (TAP), 7.1.1 (part of TANAP, part of TAP).

the efficiency of the incurred costs and the level of competition in tendering procedures to examine the specific project features and circumstances before arriving at conclusions.

BEMIP corridor:

- The total investment costs reported by project promoters are 40% higher than the total investment costs calculated by using the average UIC reference values, but within the range of maximum and minimum UIC reference values.

A better insight into the technical characteristics, the scale of the projects and the existence of cost factors dependent on geography and local circumstances may help to explain the observed deviations in the different priority corridors.

The Agency recalls the recommendations in the UIC report[97] focusing on ways that could help achieve lower project costs. At the same time, the Agency notes that the UIC should not be used by project promoters as a substitute for cost estimates developed by the promoters as a result of due diligence for the PCIs.

Key findings and recommendations

- After comparing the total reported investment cost to the total cost calculated by using UIC reference values, the Agency finds that the reported investment costs exceed the level calculated by using the UIC average reference values by 40%, while in the majority of instances costs appear to remain within a reasonable minimum-maximum range.
- The Agency notes that the reported cost estimates are similar to those reported last year. The comparison of cost estimates with reference values suggests that cost estimates, project characteristics and differences per priority corridor have not significantly changed year-on-year and that there is a general continuity in the main project features, with a few exceptions. The results of the analysis turns out to be quite intuitive, since the projects monitored this year are the same as those monitored last year, namely those included in the 2017 list of PCIs, and a calendar year is a relatively short time in the typical life cycle duration of the projects.
- The Agency reiterates to promoters and NRAs the importance of regularly monitoring project costs, and especially civil, mechanical and electro-mechanical works (CIME) costs, the modality in which contracting is executed and the effective level of competition and market conditions in tendering procedures. The Agency is of the view that the use of open and competitive tendering procedures, following the principles of publicity, transparency and accountability, has a positive effect on the cost efficiency of PCIs.

3.5 Regulatory treatment

The Agency reviewed the application of the three regulatory tools, i.e. coordinated decisions on investment requests and specific incentives in case of higher risks as stated in Regulation (EU) No 347/2013 and the exemptions according to Article 36 of Directive 2009/73/EC.

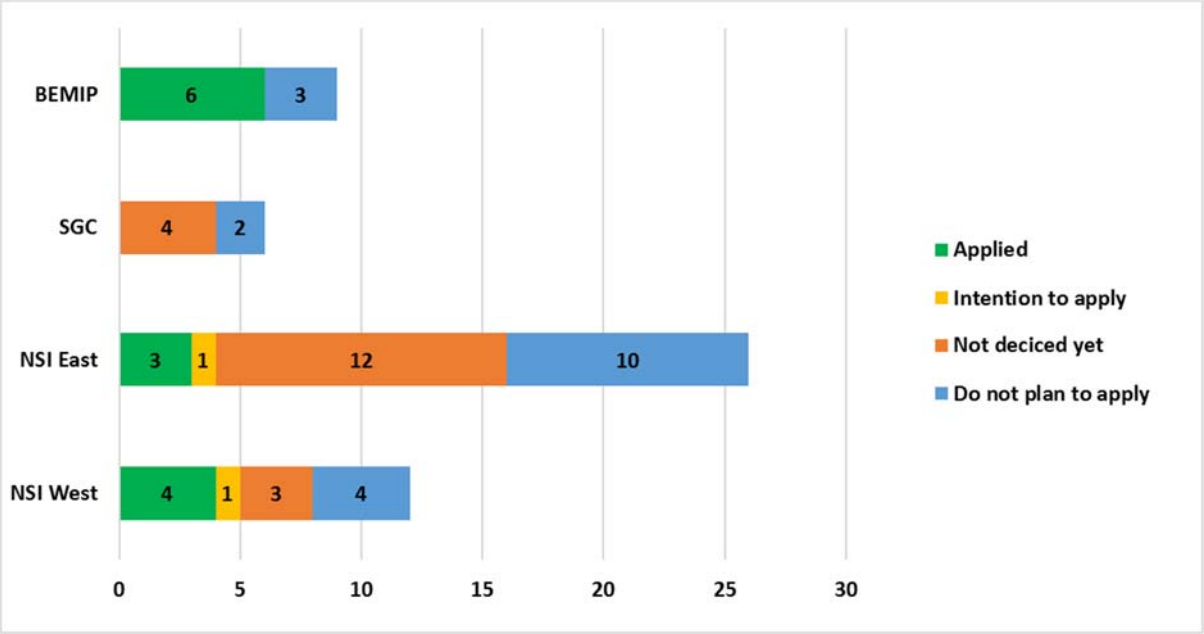
[97] Cf. ACER UIC report for gas infrastructure, July 2015, pp. 27, 28 and 31.

3.5.1 Investment requests and decisions

For the projects included in the 2017 PCI list, the project promoters submitted until 31 January 2019 investment requests, pursuant to Article 12 of Regulation (EU) No 347/2013, for 13 gas PCIs in total. In 11 out of the 13 cases, the PCIs received the decision, while, for the remaining 2 PCIs, the decision was still ongoing at the time of submission of the PCI reports. Regarding future applications, two (2) additional project promoters plan to submit an investment request[98] in the following year and 19 have not decided yet.

For more information regarding CBCA decisions please refer to the Agency's separate reports, available on the Agency's website[99].

Figure 24 - Investment requests by priority corridor



3.5.2 Risks and incentives

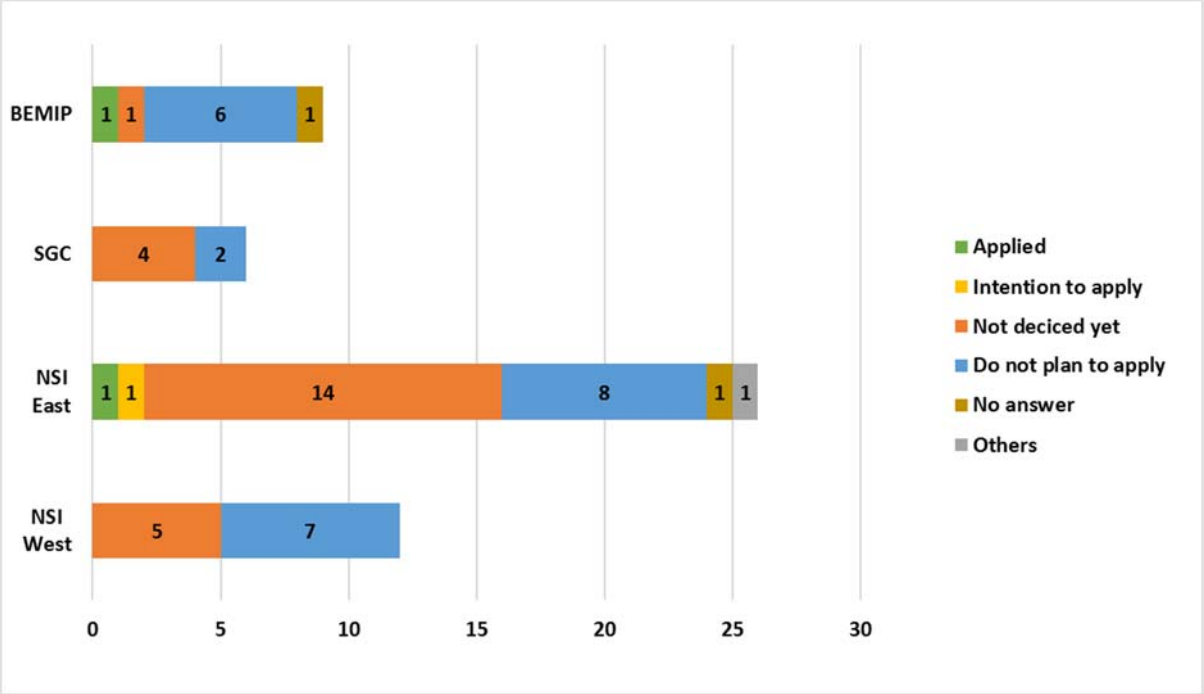
Pursuant to Article 13(5) of Regulation (EU) No 347/2013, Member States and NRAs are required to provide appropriate incentives for PCIs deemed to incur higher risks as compared to the risks normally incurred by a comparable infrastructure project. Between 1 February 2018 and 31 January 2019, only one gas PCI applied for project-specific incentives due to higher

[98] These are PCIs 5.19 and 6.8.2
[99] Agency's summary report on CBCA decisions (March 2018)
https://www.acer.europa.eu/Official_documents/Acts_of_the_Agency/Publication/Third%20Edition%20of%20the%20Agency%27s%20Summary%20Report%20on%20Cross-Border%20Cost%20Allocation%20Decisions%20-%20Status%20update%20as%20of%20March%202018.pdf
Agency's overview of CBCA decisions (December 2018)
https://www.acer.europa.eu/es/Gas/Infrastructure_development/CBCA-decisions/Documents/20181231-Overview%20of%20CBCA%20decisions.pdf

risks pursuant to Article 13(1) of the same Regulation. Only one promoter intends to apply in 2019 for project specific incentives[100] due to higher risks beyond the incentives generally provided by the regulatory frameworks. In 24 instances, the project promoters reported that they have not decided yet whether to apply in the future for project-specific risk-related incentives.

For more information regarding project-specific risk-related incentives, please refer to the Agency's separate reports[101].

Figure 25 - Specific incentives by priority corridor



3.5.3 Exemptions

Promoters may apply for an exemption from third-party access rules or certain tariff-related obligations, in line with the Third Package[102]. However, in case such an exemption is granted, the project is no longer eligible for receiving either a cross-border cost allocation decision (and thus potentially also Union financial assistance from the CEF in the form of grants for works) or specific incentives.

[100] In total 2 projects from the PCI list 2017 have applied by 31 January 2019 for incentives

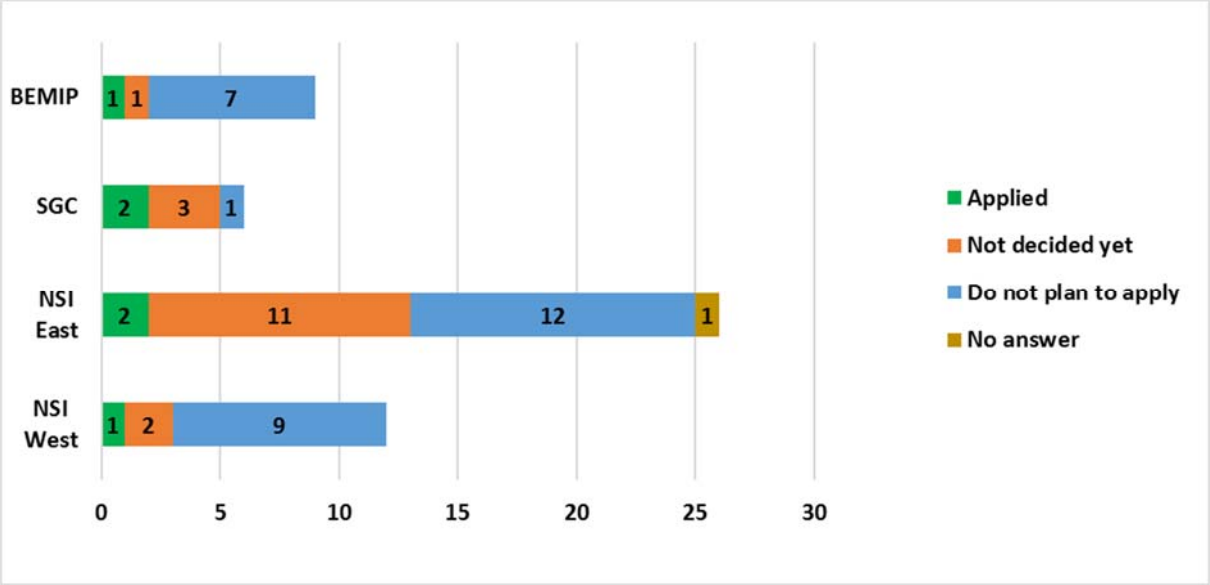
101 Agency's summary report on project-specific risk-based incentives, September 2018. https://www.acer.europa.eu/Official_documents/Acts_of_the_Agency/Publication/ACER-summary-report-on-project-specific-risk-based-incentives_2018.pdf

[102] Exemption from Articles 32, 33, 34 and Article 41(6), (8) and (10) of Directive 2009/73/EC pursuant to Article 36 of Directive 2009/73/EC as referred to in Article 12(9) and Article 13(1) of Regulation (EU) No 347/2013.

Between 1 February 2018 and 31 January 2019, a single project promoter applied for an exemption for a PCI. As shown in Figure 26, so far there are 6 PCIs on the 2017 PCI list for which the project promoters applied for an exemption, of which 5 have already received such exemptions[103] by the NRAs. 17 project promoters have not decided yet whether to apply or not.

According to the answers provided by project promoters, it seems that they still plan to use exemptions only in exceptional cases.

Figure 26 - Applications for exemptions per priority corridor



Key findings and recommendations:

- The Agency finds that exemptions and the main regulatory tools of Regulation (EU) No 347/2013 (risk-related incentives, investment requests including requests for cross-border cost allocation) have not been widely used by project promoters, and that project promoters show a limited interest in using them in the future.

[103] one project promoter has not provided an answer for the PCI

Annexes

Annex I: PCIs not included in the NDPs – electricity

PCI Code	PCI Name	Not included in the NDP of the following hosting jurisdictions	Reason for non-inclusion provided by the project promoter(s) and/or by the relevant NRAs
Transmission			
1.7.4	Interconnection between Le Havre (FR) and Lovedean (UK) [currently known as "AQUIND"]	FR, UK (Great Britain)	The French NRA informed the Agency that the project is not included in the latest NDP (2016) as it is a third-party project, but is mentioned as part of ENTSO-E TYNDP projects in the document. The GB NRA informed the Agency that the project is not included within the NDP because its exemption request pursuant to Regulation (EC) No 714/2009 was rejected. Aquind is expected by the NRA to be included within future NDP if it submits a CBCA request and/or the project moves forward via another feasible route[104].
1.7.5	Interconnection between the vicinity of Dunkerque (FR) and the vicinity of Kingsnorth (UK) [currently known as "GridLink"]	FR	The French NRA informed the Agency is not included in the latest NDP (2016) as it is a third-party project.
1.15	Interconnection between the Antwerp area (BE) and the vicinity of Kemsley (UK)	UK (Great Britain)	The GB NRA informed the Agency that the necessity of the project is not confirmed by the NRA or still under discussion[105].
1.16	Interconnection between NL and UK	UK (Great Britain); NL	The GB NRA informed the Agency that the project is not advanced enough to be included in the NDP[106]. The Dutch NRA informed the Agency that the commissioning date of the project is beyond the time span of the NDP (i.e. time horizon up to which year a project can be planned).
2.4	Interconnection between Codrongianos (IT), Lucciana (Corsica,	FR	The Corsican Operator is not a transmission system operator; however the project is included in the Corsican Energy Plan (PPE).

[104] GB NRA (Ofgem) informed the Agency that the UK NDP (in particular the Network Options Assessment for Interconnectors) includes commissioned interconnectors, projects included within Ofgem's Cap and Floor (C&F) window 1, projects included within C&F window 2 that Ofgem are minded to grant a cap and floor regime to in principle, and projects with an approved exemption. This project does not yet meet this criteria. The Ofgem also indicated that the GB NDP is a market signal rather than an assessment of the viability of individual projects, and as such inclusion in the GB NDP should not considered a barrier to PCI status.
[105] Idem footnote 104
[106] Idem footnote 104

	FR) and Suvereto (IT) [currently known as SACOI 3]		The French NRA informed the Agency that the project is a non-TSO project and non-TSO projects are normally not included in the NDP.
2.27.1	Interconnection between Aragón (ES) and Atlantic Pyrenees (FR)	FR	The French NRA informed the Agency that the project was not included in the latest NDP since the project is not advanced enough to be included in the NDP.
2.27.2	Interconnection between Navarra (ES) and Landes (FR)	FR	The French NRA informed the Agency that the project was not included in the latest NDP since the project is not advanced enough to be included in the NDP.
3.4	Wurmlach (AT) - Somplago (IT) interconnection	AT	The Austrian NRA informed the Agency that the project is not included in the Austrian NDP as it is a third party project and third party projects are normally not included in the NDP.
3.10.1	Interconnection between Hadera (IL) and Kofinou (CY)	CY	The Cypriot NRA informed the Agency that a project is a third party project and third party projects are normally not included in the NDP.
3.10.2	Interconnection between Kofinou (CY) and Korakia, Crete (EL)	CY	The Cypriot NRA informed the Agency that a project is a third party project and third party projects are normally not included in the NDP
4.8.7	Internal line between Paide and Sindi (EE)	EE	The project has been cancelled.
Storage			
1.12.3	Compressed air energy storage in Middlewich [currently known as "CARES"]	UK (Great Britain)	The GB NRA informed the Agency that storage projects are not included in the NDP.
1.12.4	Hydro-pumped electricity storage at Cruachan II	UK (Great Britain)	The GB NRA informed the Agency that storage projects are not included in the NDP. The project promoter informed that the NDP developed by National Grid is based on the generating and storage facilities that have planning or development consent. The project is currently in the process of preparing its application for consent to the Scottish Government.
1.17	Compressed air energy storage in Zuidwending (NL)	NL	The project promoter informed the Agency that as a privately promoted electricity storage project, inclusion in NDP has not been requested. The Dutch NRA informed the Agency that storage projects are not included in the NDP.
2.18	Capacity increase of hydro-pumped electricity storage in Kaunertal, Tyrol (AT)	AT	The Austrian NRA informed the Agency that storage projects are not included in the NDP and not assessed by the NRA.
2.28.1	Hydro-pumped electricity storage Mont-Negre (ES)	ES	The Spanish NRA informed the Agency that storage projects are not included in the NDP.

2.28.2	Hydro-pumped electricity storage Navaleo (es)	ES	The Spanish NRA informed the Agency that storage projects are not included in the NDP.
2.28.3	Hydro-pumped electricity storage Girones & Raïmats (es)	ES	The Spanish NRA informed the Agency that storage projects are not included in the NDP. The project promoter informed the Agency that the NDP 2015-2020 was approved by the Spanish Council of Ministers on October 2015, while Gironés-Raïmats was included in the TYNDP in 2016. However, the current NDP includes some investments linked with a new storage facility in the area. The project team is working for the full inclusion of the project in the next NDP 2021-2026.
4.6	Hydro-pumped electricity storage in Estonia	EE	The project promoter informed the Agency that power generation or storage units are not included in the Estonian NDP. All these projects appear purely on market terms and/or based on tendering processes.
Smart grid			
10.4	ACON (Czech Republic, Slovakia)	CZ, SK	The project is a smart grid project on a distribution level and the project promoter is a DSO, thus the project is not included in the NDP which refers to the transmission system level.
10.5	ALPGRID (Austria, Italy)	AT, IT	The Agency notes based on NRAs' information that smart grid projects are not included in the Austrian NDP and included in the Italian NDP depending on technological solution.
10.6	Smart Border Initiative (France, Germany)	FR, DE	The project promoter informed the Agency that the project is in the Study Phase and the investment decision will be made after the Study Phase but not before the end of 2019. Based on NRAs' information smart grid projects are not included in the French and German NDP.

Annex II: Technical modifications – electricity

PCI Code	PCI Name	PCI type	Technical modification
1.7.5	Interconnection between the vicinity of Dunkerque (FR) and the vicinity of Kingsnorth (UK) [currently known as “GridLink”]	Transmission	The length of the offshore part is changed from 140 km to 137 km
2.14	Interconnection between Thusis/Sils (CH) and Verderio Inferiore (IT) [currently known as "Greenconnector"]	Transmission	A different site for the substation has been selected; this implies a longer route (about 13 km). Change of the site of the converter station due to permitting issues increased investment costs
1.17	Compressed air energy storage in Zuidwending (NL)	Storage	320-330 MW generation capacity, 248 MW compression (to be confirmed by further design work); storage capacity 320 MW X 12 hours = 3.84 GWh
2.28.3	Hydro-pumped electricity storage Girones & Raïmats (ES)	Storage	There are no changes in the main technical characteristics of the project (e.g. installed capacity or operation flow between reservoirs). Nevertheless, some design changes are being analysed to eliminate environmental impacts in accordance with the environmental impact assessment procedure. The new design may facilitate the water concession acquisition and increase the storage volume. New connection points of the transmission line are under study in the mentioned environmental impact assessment procedure
3.24	Hydro-pumped electricity storage in Amfilochia (EL)	Storage	The High Voltage Center of 400kV (open -type) has been replaced by GIS, according to mutual agreement between the TSO and the promoter. The permanent connection rules have been issued in July 2018

Annex III: PCIs without any activity in 2018 – electricity

PCI Code	PCI Name	PCI type	Status	Commissioning date	Progress
2.13.2	Interconnection between Srananagh (IE) and Turleenan (UK)	Transmission	Planned, but not yet in permitting	2030	Rescheduled due to changes on the generation side in relation to new renewable-based generation
10.5	ALPGRID (Austria, Italy) - An innovative integration of synergetic, mature, technology based solutions in order to simultaneously increase the operational efficiency of the Italian and Austrian regional electricity systems	Smart grid	Under consideration	2022	On time, but the project difficulties encountered as it was not rewarded financial support from CEF and expects now funding opportunities at country level

Annex IV: PCI specific information – electricity[107]

PCI Code	PCI Name	Project promoter(s)	Current status	Expected year of commissioning	Current progress[108]	Main reason for delay or rescheduling (if applicable)	Investment cost at commissioning date (m€)[109]	Annual life cycle cost (m€)
1.1.1	NEMO project: interconnector between Gezelle (BE) and the vicinity of Richborough (UK)	Nemo Link Limited Elia System Operator NV/SA	Commissioned	2019	On time		No change compared to last year (650)	No change compared to last year (4)
1.1.2	Internal line between the vicinity of Richborough and Canterbury (UK)	National Grid Electricity Transmission plc	Commissioned	2018	On time		N/A	N/A
1.3.1	Interconnection between Endrup (DK) and Niebüll (DE)	TenneT TSO GmbH; Energinet.dk	Permitting	2023	Delayed	Ministry required further studies regarding the technical solution	Changed compared to last year (redacted)[110]	Changed compared to last year (redacted)[111]
1.3.2	Internal line between Niebüll and Brunsbüttel (DE)	TenneT TSO GmbH	Under construction	2021	Delayed	PERMITTING - Delays due to other permit granting reasons[112]	976.7	3.5

[107] "Redacted" means that the relevant information / figure is redacted as it was deemed sensitive information by the promoter.
[108] For the current progress, "repeatedly" means that the PCI was reported as "delayed" or "rescheduled" in 2018 as well. For PCIs which are delayed or rescheduled by not more than 6 months, this information about the duration of delay or rescheduling is also provided in the table.
[109] In some instances differences or potential inconsistencies were noted with regard to the data provided in the EU TYNDP 2018. For more information please refer to the respective cost figures in the EU TYNDP 2018 project sheets.
[110] The Agency notes that the figure provided by the project promoter is different from the total project cost indicated in the EU TYNDP 2018 project sheet for project 183.
[111] The Agency notes that the figure provided by the project promoter is different from the OPEX indicated in the EU TYNDP 2018 project sheet for project 183.
[112] Prolonged plan-approval process caused by additional requirements from the planning approval authority.

PCI Code	PCI Name	Project promoter(s)	Current status	Expected year of commissioning	Current progress[108]	Main reason for delay or rescheduling (if applicable)	Investment cost at commissioning date (m€)[109]	Annual life cycle cost (m€)
1.4.1	Interconnection between Kassø (DK) and Audorf (DE)	TenneT TSO GmbH; Energinet.dk	Under construction	2020	On time		Changed compared to last year (redacted)[113]	Changed compared to last year (redacted)[114]
1.4.2	Internal line between Audorf and Hamburg/Nord (DE)	TenneT TSO GmbH	Commissioned	2017	On time		266	1.8
1.4.3	Internal line between Hamburg/Nord and Dollern (DE)	TenneT TSO GmbH	Under construction	2019	Delayed	Delays in construction works	173	1.4
1.6	France — Ireland interconnection between La Martyre (FR) and Great Island or Knockraha (IE) [currently known as "Celtic Interconnector"]	EirGrid plc; Reseau de Transport d'Electricite (RTE)	Planned, but not yet in permitting	2026	On time		930	8.4
1.7.1	France-United Kingdom interconnection between Cotentin (FR) and the vicinity of Exeter (UK) [currently known as “FAB”]	FAB Link Limited; Reseau de Transport d'Electricite (RTE)	Permitting	2024	Delayed (repeatedly)	Delays due to risks related to the national regulatory framework or uncertainty of regulatory opposition	Changed compared to last year, but updated figure was not provided[115]	Changed compared to last year, but updated figure was not provided[116]

[113] The Agency notes that the figure provided by the project promoter is different from the total project cost indicated in EU TYNDP 2018 project sheet for project 39.
[114] The Agency notes that the figure provided by the project promoter is different from the OPEX indicated in the EU TYNDP 2018 project sheet for project 39.
[115] Due to ongoing procurement process.
[116] Due to ongoing procurement process.

PCI Code	PCI Name	Project promoter(s)	Current status	Expected year of commissioning	Current progress[108]	Main reason for delay or rescheduling (if applicable)	Investment cost at commissioning date (m€)[109]	Annual life cycle cost (m€)
1.7.2	Interconnection between Tourbe (FR) and Chilling (UK) [Currently known as "IFA2"]	Réseau de Transport d'Electricité (RTE); National Grid Interconnector Holdings Limited	Under construction	2020	On time		740[117]	No change compared to last year (5)
1.7.3	France - United Kingdom Interconnection between Coquelles (FR) and Folkestone (UK) [Currently known as "ElecLink"]	ElecLink Limited	Under construction	2019	On time		580	No change compared to last year (15.4)
1.7.4	Interconnection between Le Havre (FR) and Lovedean (UK) [currently known as “AQUIND”]	Aquind Limited	Permitting	2023	Delayed (repeatedly)	PERMITTING - Delays due to Other permit granting reason[118]	No change compared to last year (1400)	No change compared to last year (27.97)
1.7.5	Interconnection between the vicinity of Dunkerque (FR) and the vicinity of Kingsnorth (UK) [currently known as “GridLink”]	Elan Energy Ltd	Permitting	2024	Delayed (repeatedly)	Delays due to risks related to the national regulatory framework or uncertainty of regulatory opposition	897	No change compared to last year (23.9)
1.8.1	Interconnection Germany — Norway [currently known as "NordLink"],	Statnett SF	Under Construction	2020	Delayed	Delays in construction works	No change compared to last year (2000)	No change compared to last year (53)

[117] Data provided by CRE based on information submitted by RTE in the framework of their application for the incentive regulation in 2017.
[118] The project has been designated a ‘Nationally Significant Infrastructure Project’ status and the planning application is done via a different process which takes longer than the ‘conventional planning application’.

PCI Code	PCI Name	Project promoter(s)	Current status	Expected year of commissioning	Current progress[108]	Main reason for delay or rescheduling (if applicable)	Investment cost at commissioning date (m€)[109]	Annual life cycle cost (m€)
	between Wilster (DE) and Tonstad (NO)							
1.9.1	Ireland - United Kingdom interconnection between Wexford (IE) and Pembroke, Wales (UK) [currently known as "Greenlink"]	Greenlink Interconnector Limited[119]	Planned, but not yet in permitting	2023	On time		No change compared to last year (400)	No change compared to last year (8.4)
1.10.1	Interconnection between Blythe (UK) and Kvilldal (NO) [currently known as "North Sea Link"]	Statnett SF; National Grid Interconnector Holdings Limited	Under consideration	2021	On time		Changed compared to last year (redacted)[120]	No change compared to last year (redacted)[121]
1.10.2	Interconnection between Peterhead (UK) and Simadalen (NO) [currently known as "NorthConnect"]	NorthConnect KS	Permitting	2024	Delayed	PERMITTING - National law changes affecting permitting	No change compared to last year (1613)	No change compared to last year (25)
1.12.3	Compressed air energy storage in Middlewich [currently known as "CARES"]	Storelectric Limited	Planned, but not yet in permitting	2027	Delayed (less than 6 months compared to last year)	Delays due to financing reasons	No change compared to last year (560)	No change compared to last year
1.12.4	Hydro-pumped electricity storage at Cruachan II	Drax Generation Enterprise Limited	Planned, but not yet in permitting	2026	Rescheduled	Project was still at an initial stage (under studies) and therefore the previous	No change compared to last year (688)	No change compared to last year

[119] Previous name was Greenwire Transmission Pembroke Limited
[120] The Agency notes that the figure provided by the project promoter is different from the total project cost indicated in EU TYNDP 2018 project sheet for project 110.
[121] The Agency notes that the figure provided by the project promoter is different from the OPEX indicated in the EU TYNDP 2018 project sheet for project 110.

PCI Code	PCI Name	Project promoter(s)	Current status	Expected year of commissioning	Current progress[108]	Main reason for delay or rescheduling (if applicable)	Investment cost at commissioning date (m€)[109]	Annual life cycle cost (m€)
						implementation plan was preliminary		
1.12.5	Hydro-pumped electricity storage at Coire Glas	SSE	Permitting	2028	Rescheduled (repeatedly)	Project was still at an initial stage (under studies) and therefore the previous implementation plan was preliminary	No change compared to last year (1100)	No change compared to last year
1.14	Interconnection between Revsing (DK) and Bicker Fen (UK) [currently known as "Viking Link"	National Grid Interconnector Holdings Ltd.; Energinet.dk	Permitting	2023	Delayed	PERMITTING - Delays due to other permit granting reason[122]	No change compared to last year (1970)[123]	No change compared to last year (16)[124]
1.15	Interconnection between the Antwerp area (BE) and the vicinity of Kemsley (UK)	Elia System Operator NV/SA	Under consideration	2028	On time		1000[125]	No change compared to last year (redacted) [126]
1.16	Interconnection between NL and UK	National Grid; TenneT TSO BV	Under consideration	2030	On time		No change compared to last year (850)	No change compared to last year (6.2)
1.17	Compressed air energy storage in Zuidwending (NL)	Corre Energy Storage BV	Under consideration	2024	Ahead of schedule		No change compared to last year (400)	32.6

[122] The PCI faced a permitting delay on receiving UK onshore consents and German offshore consents.
[123] The Agency did not accept the project promoter's claim for confidentiality as the provided figure is publicly available in the EU TYNDP 2018 project sheet for project 167.
[124] The Agency did not accept the project promoter's claim for confidentiality as the provided figure is publicly available in the EU TYNDP 2018 project sheet for project 167.
[125] The Agency did not accept the project promoter's claim for confidentiality as the provided figure is publicly available in EU TYNDP 2018 project sheet for project 121.
[126] The Agency notes that the figure provided by the project promoter is different from the OPEX indicated in the EU TYNDP 2018 project sheet for project 121.

PCI Code	PCI Name	Project promoter(s)	Current status	Expected year of commissioning	Current progress[108]	Main reason for delay or rescheduling (if applicable)	Investment cost at commissioning date (m€)[109]	Annual life cycle cost (m€)
1.18	Offshore hydro-pumped electricity storage facility in Belgium [currently known as "iLand"]	THV iLand	Planned, but not yet in permitting	2024	Delayed	Complex negotiations due to specific design	No change compared to last year (1327)	No change compared to last year
2.2.1	First interconnection between Lixhe (BE) and Oberzier (DE) [currently known as "ALEGrO"]	Amprion GmbH; Elia System Operator NV/SA	Under construction	2020	On time		560	No change compared to last year (redacted)[127]
2.2.4	Second interconnection between Belgium and Germany	Amprion GmbH; Elia System Operator NV/SA	Under consideration	2028[128]	On time		600	4.8
2.4	Interconnection between Codrongianos (IT), Lucciana (Corsica, FR) and Suvereto (IT) [currently known as SACOI 3]	Terna - Rete Elettrica Nazionale SpA	Permitting[129]	2024[130]	Rescheduled	Due to voluntary consultation process	No change compared to last year (700)	No change compared to last year (7)

[127] The Agency notes that the figure provided by the project promoter is different from the OPEX indicated in the EU TYNDP 2018 project sheet for project 92.
[128] The German NRA underlined that the commissioning date is based on the information provided by the project promoter and it has not yet been approved in the NDP.
[129] Based on the information provided by the Italian NRA, the project is already in permitting.
[130] Based on the information provided by the Italian NRA, the project's commissioning date may be 2024 instead of 2023.

PCI Code	PCI Name	Project promoter(s)	Current status	Expected year of commissioning	Current progress[108]	Main reason for delay or rescheduling (if applicable)	Investment cost at commissioning date (m€)[109]	Annual life cycle cost (m€)
2.5.1	Interconnection between Grand Ile (FR) and Piossasco (IT) [currently known as "Savoie-Piemont"]	Terna - Rete Elettrica Nazionale SpA; Reseau de Transport d'Electricite (RTE)	Under construction	2020[131]	Delayed[132]	Delays in construction works[133] (Causes of force majeure)	No change compared to last year (redacted)[134]	No change compared to last year (5)[135]
2.7	Interconnection between Aquitaine (FR) and the Basque country (ES) [currently known as "Biscay Gulf"]	Reseau de Transport d'Electricite (RTE); Red Eléctrica de España SAU	Permitting	2025	On time		No change compared to last year (1750)[136]	No change compared to last year (10.2)[137]
2.9	Internal line between Osterath and Philippsburg (DE) to increase capacity at western borders [currently known as "Ultranet"]	Amprion GmbH; TransnetBW GmbH	Planned, but not yet in permitting	2023	On time		No change compared to last year (1070)	No change compared to last year (2.14)
2.10	Internal line between Brunsbüttel-Groβgartach and Wilster-Grafenrheinfeld (DE) to increase capacity at	TenneT TSO GmbH (DE), TransnetBW GmbH (DE)	Planned, but not yet in permitting	2025	On time		No change compared to last year (6500)	No change compared to last year (15.9)

[131] Based on the information provided by the Italian NRA, the project's commissioning date may be 2020 instead of 2019.
[132] The Agency's reclassification of the project's progress from 'rescheduling' based on the project promoter's description.
[133] Idem.
[134] The Agency notes that the figure provided by the project promoter is different from the total project cost indicated in EU TYNDP 2018 project sheet for project 21.
[135] The Agency did not accept the project promoter's claim for confidentiality as the provided figure is publicly available in the EU TYNDP 2018 project sheet for project 21.
[136] The Agency did not accept the project promoter's claim for confidentiality as the provided figure is publicly available in the EU TYNDP 2018 project sheet for project 16.
[137] Idem.

PCI Code	PCI Name	Project promoter(s)	Current status	Expected year of commissioning	Current progress[108]	Main reason for delay or rescheduling (if applicable)	Investment cost at commissioning date (m€)[109]	Annual life cycle cost (m€)
	northern and southern borders [currently known as "Suedlink"]							
2.13.1	Ireland-United Kingdom Interconnection between Woodland (IE) and Turleenan (UK – Northern Ireland)	EirGrid plc; SONI Ltd	Permitting	2023	Delayed (repeatedly)	Delays due to lawsuits and court proceedings	No change compared to last year (286)	No change compared to last year (9.5)
2.13.2	Interconnection between Srananagh (IE) and Turleenan (UK)	EirGrid plc; SONI Ltd	Planned, but not yet in permitting	2030	Rescheduled (repeatedly)	Changes on the generation side (in relation to new renewable-based generation)	392	No change compared to last year (0.8)
2.14	Interconnection between Thusis/Sils (CH) and Verderio Inferiore (IT) [currently known as "Greenconnector"]	Greenconnector Srl Greenconnector AG	Permitting	2024	Delayed (repeatedly)	PERMITTING - Delays due to environmental problems	561	2
2.15.1	Interconnection between Airolo (CH) and Baggio (IT)	Terna - Rete Elettrica Nazionale SpA; Swissgrid	Permitting	2029	Delayed[138]	Strong local opposition during the permitting process	No change compared to last year (910)[139]	No change compared to last year (4)[140]
2.16.1	Internal line between Pedralva and Sobrado (PT), formerly designated Pedralva and Alfena (PT)	Rede Eléctrica a Nacional, S.A.	Planned, but not yet in permitting	2023	On time		No change compared to last year (28.5)	No change compared to last year (0.17)

[138] The Agency's reclassification of the project's progress from 'rescheduling' based on the project promoter's description.
[139] The Agency did not accept the project promoter's claim for confidentiality as the provided figure is publicly available in the EU TYNDP 2018 project sheet for project 31.
[140] Idem.

PCI Code	PCI Name	Project promoter(s)	Current status	Expected year of commissioning	Current progress[108]	Main reason for delay or rescheduling (if applicable)	Investment cost at commissioning date (m€)[109]	Annual life cycle cost (m€)
2.16.3	Internal line between Vieira do Minho, Ribeira de Pena and Feira (PT), formerly designated Frades B, Ribeira de Pena and Feira (PT)	Rede Eléctrica Nacional, S.A.	Permitting	2021	On time		No change compared to last year (74.9)	
2.17	Portugal — Spain interconnection between Beariz — Fontefría (ES), Fontefria (ES) — Ponte de Lima (PT) (formerly Vila Fria/Viana do Castelo) and Ponte de Lima — Vila Nova de Famalicão (PT) (formerly Vila do Conde) (PT), including substations in Beariz (ES), Fontefría (ES) and Ponte de Lima (PT)	Red Eléctrica de España SAU; Rede Eléctrica Nacional S.A.	Permitting	2021	On time		111.9[141]	1.09[142]
2.18	Capacity increase of hydro-pumped electricity storage in Kaunertal, Tyrol (AT)	TIWAG-Tiroler Wasserkraft AG	Permitting	2034	On time		Changed compared to last year (redacted)[143]	Changed compared to last year (redacted)[144]

[141] The information is based on the information provided by the Spanish NRA. The figure is equal to the total project cost data provided in the EU TYNDP 2018 project sheet for project 4.
[142] Idem.
[143] The Agency notes that the figure provided by the project promoter is different from the total project cost indicated in the EU TYNDP 2018 project sheet for project 1001.
[144] The Agency notes that the figure provided by the project promoter is different from the OPEX indicated in the EU TYNDP 2018 project sheet for project 1001.

PCI Code	PCI Name	Project promoter(s)	Current status	Expected year of commissioning	Current progress[108]	Main reason for delay or rescheduling (if applicable)	Investment cost at commissioning date (m€)[109]	Annual life cycle cost (m€)
2.23	Internal lines at the Belgian north border between Zandvliet and Lillo- Liefkenshoek (BE),and between Liefkenshoek and Mercator, including a substation in Lillo (BE) [currently known as "BRABO II + III"]	Elia System Operator SA	Permitting	2025	Rescheduled	Changes due to priority given to other transmission investments	220.1	No change compared to last year (0.3)
2.24	Internal Belgian Backbone West between Horta-Mercator (BE)	Elia System Operator SA	Under construction	2019	On time		No change compared to last year (100)	No change compared to last year (0.01)
2.27.1	Interconnection between Aragón (ES) and Atlantic Pyrenees (FR)	Réseau de Transport d'Electricité; Red Eléctrica de España SAU	Planned, but not yet in permitting	2030	Rescheduled[145] (repeatedly)	Rescheduled due to correlation with other infrastructure investment[146]	1170[147]	No change compared to last year (redacted)[148]

[145] The Agency's classification based on the project promoter's description.
[146] The Agency's classification based on the project promoters' description.
[147] The information is based on the information provided by the Spanish NRA. The figure is equal to the total project cost data provided in the EU TYNDP 2018 project sheet for project 270.
[148] The Agency notes that the figure provided by the project promoter is different from the OPEX indicated in the EU TYNDP 2018 project sheet for project 270.

PCI Code	PCI Name	Project promoter(s)	Current status	Expected year of commissioning	Current progress[108]	Main reason for delay or rescheduling (if applicable)	Investment cost at commissioning date (m€)[109]	Annual life cycle cost (m€)
2.27.2	Interconnection between Navarra (ES) and Landes (FR)	Réseau de Transport d'Electricité; Red Eléctrica de España SAU	Planned, but not yet in permitting	2029	Rescheduled[149] (repeatedly)	Rescheduled due to correlation with other infrastructure investment[150]	No change compared to last year (1470)[151]	9.5[152]
2.28.1	Hydro-pumped electricity storage Mont-Negre (ES)	Ingenieria Pontificia S.L.	Permitting	2020[153]	On time		No change compared to last year (1634)	No change compared to last year
2.28.2	Hydro-pumped electricity storage Navaleo (ES)	CDR TREMOR S.L.	Permitting	2024	On time		No change compared to last year (258)	No change compared to last year
2.28.3	Hydro-pumped electricity storage Girones & Raïmats (ES)	JOSE ANTONIO ROMERO POLO, S.A.U.	Permitting	2025	On time		No change compared to last year (1900)	No change compared to last year
3.1.1	Interconnection between St. Peter (AT) and Isar (DE)	TenneT TSO GmbH; Austrian Power Grid AG	Permitting	2022	Delayed (repeatedly) (less than 6 months compared to last year)	Required additional assessments due to request by citizens and involved parties during public hearings for alternative routings and legal changes	No change compared to last year (300)	9.28

[149] Agency's classification based on the project promoter's description.
[150] Agency's classification of the reason of delay based on the project promoters' description.
[151] The Agency did not accept the project promoter's claim for confidentiality as the provided figure is publicly available in the EU TYNDP 2018 project sheet for project 276.
[152] The information is based on the information provided by the Spanish NRA. The figure is equal to the OPEX data provided in the EU TYNDP 2018 project sheet for project 276.
[153] According to the information of the Spanish NRA the commissioning date declared by the project promoter is not realistic.

PCI Code	PCI Name	Project promoter(s)	Current status	Expected year of commissioning	Current progress[108]	Main reason for delay or rescheduling (if applicable)	Investment cost at commissioning date (m€)[109]	Annual life cycle cost (m€)
						related to spatial planning[154]		
3.1.2	Internal line between St. Peter and Tauern (AT)	Austrian Power Grid AG	Permitting	2024	Delayed	Delays due to lawsuits and court proceedings	N/A	N/A
3.1.4	Internal line between Westtirol and Zell-Ziller (AT)	Austrian Power Grid AG	Under consideration	2025	Rescheduled (repeatedly)	Project was still at an initial stage (under studies) and therefore the previous implementation plan was preliminary[155]	N/A	N/A
3.2.2	Internal line between Lienz and Obersielach (AT)	Austrian Power Grid AG	Planned, but not yet in permitting	2028	Rescheduled (repeatedly)	Changes due to priority given to other transmission investments	N/A	No change compared to last year (redacted)
3.4	Austria — Italy interconnection between Wurmlach (AT) and Somplago (IT)	Alpe Adria Energia S.p.A.	Permitting	2022	Delayed (repeatedly)	PERMITTING - Delays due to other permit granting reason[156]	92.6	0.64
3.7.1	Interconnection between Maritsa East 1 (BG) and N. Santa (EL)	Elektroenergien sistemen operator (ESO) EAD; Independent Power Transmission Operator (IPTO)	Permitting	2023	On time		No change compared to last year (188.2)	No change compared to last year (0.1)

[154] The Agency's classification based on the project promoter's description of the reason for delay.
[155] The Agency's classification based on the project promoter's description of the reason for rescheduling.
[156] Permitting procedure required several meetings with both authorities and stakeholders.

PCI Code	PCI Name	Project promoter(s)	Current status	Expected year of commissioning	Current progress[108]	Main reason for delay or rescheduling (if applicable)	Investment cost at commissioning date (m€)[109]	Annual life cycle cost (m€)
3.7.2	Internal line between Maritsa East 1 and Plovdiv (BG)	Elektroenergien sistemen operator (ESO) EAD	Permitting	2021	Rescheduled	Project was still at an initial stage (under studies) and therefore the previous implementation plan was preliminary		
3.7.3	Internal line between Maritsa East 1 and Maritsa East 3 (BG)	Elektroenergien sistemen operator (ESO) EAD	Permitting	2020	On time			
3.7.4	Internal line between Maritsa East 1 and Burgas (BG)	Elektroenergien sistemen operator (ESO) EAD	Permitting	2021	On time			
3.8.1	Internal line between Dobrudja and Burgas (BG)	Elektroenrgien sistemen operator (ESO) EAD	Under construction	2021	On time		65.26	0.8
3.8.4	Internal line between Cernavoda and Stalpu (RO)	CNTEE Transelectrica SA	Under construction	2020	Ahead of schedule		72	0.48
3.8.5	Internal line between Gutinas and Smardan (RO)	CNTEE Transelectrica SA	Permitting	2022	On time		38	0.19
3.9.1	Interconnection between Žerjavenec (HR)/Hévíz (HU) and Cirkovce (SI)	ELES, d.o.o., sistemski operater prenosnega elektroenergetskega omrežja	Permitting	2021	Delayed[157] (less than 6 months compared to last year)	PERMITTING - Delays due to environmental problems and land acquisition	134.5	3

[157] The Agency's classification based on Slovenian NRA's information.

PCI Code	PCI Name	Project promoter(s)	Current status	Expected year of commissioning	Current progress[108]	Main reason for delay or rescheduling (if applicable)	Investment cost at commissioning date (m€)[109]	Annual life cycle cost (m€)
3.10.1	Interconnection between Hadera (IL) and Kofinou (CY)[158]	EuroAsia Interconnector Ltd	Permitting	2023	Rescheduled	Changes due to priority given to other transmission investments	No change compared to last year (redacted)[159]	No change compared to last year (redacted) [160]
3.10.2	Interconnection between Kofinou (CY) and Korakia, Crete (EL)[161]	EuroAsia Interconnector Ltd	Permitting	2023	Delayed	Delays due to correlation with another project (PCI 3.10.3)[162]		
3.10.3	Internal line between Korakia, Crete and Attica region (EL)[163]	EuroAsia Interconnector Ltd	Permitting	2022	On time[164]			
3.11.1	Internal line between Vernerov and Vitkov (CZ)	CEPS, a.s	Permitting	2025	On time		Changed compared to last year (redacted)	Changed compared to last year (redacted)
3.11.2	Internal line between Vitkov and Prestice (CZ)	CEPS, a.s.	Under construction	2021	On time		109.03	0.01

[158] The project promoter indicated that the costs and benefits values provided for this project concerns the whole cluster 3.10. Regarding status, implementation and progress, the dates refer to the first stage of the overall cluster i.e. 1000 MW for each PCI.
[159] The Agency notes that the figure provided by the project promoter is different from the total project cost indicated in the EU TYNDP 2018 project sheet for project 219.
[160] The Agency notes that the figure provided by the project promoter is different from the OPEX indicated in the EU TYNDP 2018 project sheet for project 219.
[161] The project promoter indicated that the costs and benefits values provided for this project concerns the whole cluster 3.10. Regarding status, implementation and progress, the dates refer to the first stage of the overall cluster i.e. 1000 MW for each PCI.
[162] The Agency's classification based on the project promoter's description and additional NRA's information regarding the reason for delay.
[163] The project promoter indicated that the costs and benefits values provided for this project concerns the whole cluster 3.10. Regarding status, implementation and progress, the dates refer to the first stage of the overall cluster i.e. 1000 MW for each PCI.
[164] The Agency's classification based on the comparison of the commissioning date provided by the project promoter with the commissioning date in the Agency's 2018 PCI monitoring report.

PCI Code	PCI Name	Project promoter(s)	Current status	Expected year of commissioning	Current progress[108]	Main reason for delay or rescheduling (if applicable)	Investment cost at commissioning date (m€)[109]	Annual life cycle cost (m€)
3.11.3	Internal line between Prestice and Kocin (CZ)	CEPS, a.s.	Permitting (last year: Under construction) [165]	2028	On time		Changed compared to last year (redacted)	Changed compared to last year (redacted)
3.11.4	Internal line between Kocin and Mirovka (CZ)	CEPS, a.s.	Permitting (last year: Under construction)	2026	Delayed	PERMITTING - Delays due to other permit granting reason[166]	Changed compared to last year (redacted)	No change compared to last year (redacted)
3.11.5	Internal line between Mirovka and line V413 (CZ)	CEPS, a.s.	Under construction	2019	On time		31.1	0.001
3.12	Internal line in Germany between Wolmirstedt and Bavaria to increase internal North-South transmission capacity	50Hertz Transmission GmbH; TenneT TSO GmbH	Planned, but not yet in permitting	2025	On time		No change compared to last year (2800)	22.4
3.14.2	Internal line between Krajnik and Baczyna (PL)	Polskie Sieci Elektroenergetyczne S.A	Under construction	2021	On time		70.2	0.75
3.14.3	Internal line between Mikułowa and Świebodzice (PL)	Polskie Sieci Elektroenergetyczne S.A	Planned, but not yet in permitting	2024	On time		Changed compared to last year (redacted)	
3.14.4	Internal line between Baczyna and Plewiska (PL)	Polskie Sieci Elektroenergetyczne S.A.	Permitting	2025	On time		Changed compared to last year (redacted)	
3.16.1	Interconnection Hungary - Slovakia between	SEPS, Slovenská elektrizačná	Permitting	2020	On time		27.98	1.42

[165] One of the investment items of the project is already under construction.
[166] Public objections related to land permit.

PCI Code	PCI Name	Project promoter(s)	Current status	Expected year of commissioning	Current progress[108]	Main reason for delay or rescheduling (if applicable)	Investment cost at commissioning date (m€)[109]	Annual life cycle cost (m€)
	Gabčíkovo (SK) and Gönyű (HU) and Veľký Ďur (SK)	prenosová sústava, a.s.; MAVIR Hungarian Independent Transmission Operator Company Ltd.						
3.17	Interconnection Hungary - Slovakia between Sajóivánka (HU) and Rimavská Sobota (SK)	MAVIR Hungarian Independent Transmission Operator Company Ltd; SEPS, Slovenská elektrizačná prenosová sústava, a.s.	Permitting	2020	On time		51.36	N/A
3.22.5	Interconnection between Villanova (IT) and Lastva (ME)	CGES; Terna S.p.A. - Rete Elettrica Nazionale	Under construction[167]	2019	On time		No change compared to last year (redacted)	No change compared to last year (redacted)
3.21	Interconnection between Salgareda (IT) and Divača — Bericevo region (SI)	ELES, d.o.o.; Terna S.p.A. - Rete Elettrica Nazionale	Under consideration	After 2030[168]	Rescheduled (repeatedly)	Project was still at an initial stage and previous implementation plan was preliminary[169]	No change compared to last year (870)	4

[167] The Italian NRA informed the Agency that half (1st pole) "under construction", half (2nd pole) "under consideration" based on ARERA deliberation 674/2018.
[168] Information based on the Slovenian NRA's review.
[169] The Agency's classification based on the project promoters' description of the reason for rescheduling, i.e. The project is still under consideration on Slovenian side.

PCI Code	PCI Name	Project promoter(s)	Current status	Expected year of commissioning	Current progress[108]	Main reason for delay or rescheduling (if applicable)	Investment cost at commissioning date (m€)[109]	Annual life cycle cost (m€)
3.22.1	Interconnection between Resita (RO) and Pancevo (RS)	CNTEE Transelectrica SA; ELEKTROMREZA SRBIJE	Construction works finalised[170]	2021	Delayed (repeatedly)	Delays due to correlation with other delayed infrastructure investments	22.2	0.1
3.22.2	Internal line between Portile de Fier and Resita (RO)	CNTEE Transelectrica SA	Under construction	2021	On time		47	0.34
3.22.3	Internal line between Resita and Timisoara/Sacalaz (RO)	CNTEE Transelectrica SA	Permitting	2023	On time		33	0.23
3.22.4	Internal line between Arad and Timisoara/Sacalaz (RO)	CNTEE Transelectrica SA	Planned, but not yet in permitting	2027	On time		44	0.35
3.23	Hydro-pumped electricity storage in Yadenitsa (BG)	NATSIONALNA ELEKTRICHESKA KOMPANIA EAD	Permitting	2025	On time		No change compared to last year (176)	No change compared to last year
3.24	Hydro-pumped electricity storage in Amfilochia (EL)	TERNA ENERGY S.A.	Permitting	2024	Delayed (repeatedly)	PERMITTING - Delays due to environmental problems	No change compared to last year (502)	No change compared to last year

[170] The Agency's classification based on the project promoter's description; The execution works had been finalized (31/03/2018) but the line is not in commercial operation because the substation that the OHL connects to at Resita is 220 kV and the upgrade of the substation to 400 kV is part of another project (PCI 3.22.2) and not yet finalized.

PCI Code	PCI Name	Project promoter(s)	Current status	Expected year of commissioning	Current progress[108]	Main reason for delay or rescheduling (if applicable)	Investment cost at commissioning date (m€)[109]	Annual life cycle cost (m€)
3.27	Interconnection between Sicily (Italy) and Tunisia node (TU) [currently known as "ELMED"]	Terna S.p.A. - Rete Elettrica Nazionale	Under consideration [171]	2027	Delayed[172] (repeatedly)	Lack of agreement between the involved countries[173]	No change compared to last year (600)	3
4.1	Denmark — Germany interconnection between Ishøj/ Bjæverskov (DK) and Bentwisch (DE) via offshore windparks Kriegers Flak (DK) and Baltic 1 and 2 (DE) [currently known as "Kriegers Flak Combined Grid Solution"]	Energinet.dk; 50 Hertz Transmission GmbH	Under construction	2019	Delayed	Delays in construction works	Changed compared to last year (redacted)[174]	No change compared to last year (16)[175]
4.2.1	Interconnection between Kilingi-Nõmme (EE) and Riga CHP2 substation (LV)	Augstsprieguma tikls AS; Elering AS	Under construction	2020	On time		No change compared to last year (176)	No change compared to last year (0.37)
4.2.2	Internal line between Harku and Sindi (EE)	Elering AS	Under construction	2020	On time			
4.2.3	Internal line between Riga CHP 2 and Riga HPP (LV)	Augstsprieguma tikls AS	Under construction	2020	On time			

[171] The Italian NRA informed the Agency that the project is "under consideration" based on ARERA deliberation 674/2018. The project never received an approval / positive opinion from ARERA.
[172] The Agency's reclassification of the project's progress from "rescheduling" based on the project promoter's description.
[173] Idem.
[174] The Agency notes that the figure provided by the project promoter is different from the total project cost indicated in the EU TYNDP 2018 project sheet for project 36.
[175] The Agency did not accept the project promoter's claim for confidentiality as the provided figure is publicly available in the EU TYNDP 2018 project sheet for project 36.

PCI Code	PCI Name	Project promoter(s)	Current status	Expected year of commissioning	Current progress[108]	Main reason for delay or rescheduling (if applicable)	Investment cost at commissioning date (m€)[109]	Annual life cycle cost (m€)
4.4.1	Internal line between Ventspils, Tume and Imanta (LV)	Augstsprieguma tikls AS;	Under construction	2019	On time		No change compared to last year	No change compared to last year
4.4.2	Internal line between Ekhyddan and Nybro/Hemsjö (SE)	Affärsverket svenska kraftnät	Permitting	Not specified (last year: 2023)	Delayed	Delays due to lawsuits and court proceedings	150	
4.5.2	Internal line between Stanisławów and Ostrołęka (PL)	Polskie Sieci Elektroenergetyczne S.A.	Under construction	2023	On time		70.96	0.24
4.6	Hydro-pumped electricity storage in Estonia	Energiasalv Pakri OÜ	Permitting	2028	On time		No change compared to last year (330)	No change compared to last year
4.7	Capacity increase of hydro-pumped storage in Lithuania - Kruonis	Lietuvos energija, UAB	Under consideration	2024	On time		No change compared to last year (160)	No change compared to last year
4.8.1	Interconnection between Tartu (EE) and Valmiera (LV)	Augstsprieguma tikls AS; Elering AS	Planned, but not yet in permitting	2023	On time		53.66	N/A
4.8.2	Internal line between Balti and Tartu (EE)	Elering AS	Permitting	2023	Ahead of schedule		51.21	N/A
4.8.3	Interconnection between Tsirguliina (EE) and Valmiera (LV)	Augstsprieguma tikls AS; Elering AS	Planned, but not yet in permitting	2024	On time		22	N/A
4.8.4	Internal line between Eesti and Tsirguliina (EE)	Elering AS	Permitting	2025	Ahead of schedule		73.20	N/A

PCI Code	PCI Name	Project promoter(s)	Current status	Expected year of commissioning	Current progress[108]	Main reason for delay or rescheduling (if applicable)	Investment cost at commissioning date (m€)[109]	Annual life cycle cost (m€)
4.8.5	Internal line between substation in Lithuania and state border (LT)[176]	Litgrid AB	Under consideration	2025	On time[177]		N/A[178]	N/A[179]
4.8.7	Internal line between Paide and Sindi (EE)	Elering AS	Cancelled					
4.8.8	Internal line between Vilnius and Neris (LT)	Litgrid AB	Permitting	2025	On time		23.81	0.06
4.8.9	Further infrastructure aspects of the synchronisation of the Baltic States' electricity system with the European networks	Augstsprieguma tikls AS; Elering AS; Litgrid AB	Planned, but not yet in permitting	2025	On time		N/A[180]	N/A
4.10.1	Interconnection between northern Finland and northern Sweden	Fingrid; Affärsverket svenska kraftnät	Planned, but not yet in permitting	2025	On time		200	0.24
4.10.2	Internal line between Keminmaa and Pyhänselkä (FI)	Fingrid	Permitting	2024	On time		No change compared to last year (50)	N/A

[176] The project promoter informed the Agency that for the 4th PCI list the project is proposed by the project promoter to be replaced with a new project: "New HVDC subsea cable connection between Lithuania and Poland"(investment 1034 of TYNDP 2018 project 170). Changes were made with regard to the 28/06/2018 political decision on Baltic States synchronisation scenario, implemented it through the existing double-circuit AC line between Lithuania and Poland known as 'LitPol Link' and complemented with an additional direct current submarine cable between Poland and Lithuania (new HVDC "Harmony Link"). For this reason the project status regressed to "under consideration", depending on further improvements of the Baltic States synchronisation.
[177] Idem.
[178] The project promoter informed the Agency that the data on investment costs will be provided subject to the acceptance of the proposal to replace the project with a new project.
[179] Idem.
[180] The project promoter informed the Agency that it cannot be currently measured as it depends on the scope of pre-planned synchronisation studies and following projects.

PCI Code	PCI Name	Project promoter(s)	Current status	Expected year of commissioning	Current progress[108]	Main reason for delay or rescheduling (if applicable)	Investment cost at commissioning date (m€)[109]	Annual life cycle cost (m€)
10.3	SINCRO.GRID (Slovenia, Croatia)	ELES, d.o.o.; HOPS d.o.o.; HEP–ODS d.o.o.; SODO d.o.o.	Permitting	2021	On time		No change compared to last year (88.6)	1.81
10.4	ACON (Czech Republic, Slovakia)	Západoslovenská distribučná, a.s.; E.ON Distribuce, a.s.	Planned, but not yet in permitting	2024	On time		No change compared to last year (221)	15.35
10.5	ALPGRID (Austria, Italy)	E-distribuzione; ENEL Green Power; ENEL Produzione; Wiener Netze; Kärnten Netz; VERBUND	Under consideration	2022	On time		No change compared to last year (90.76)	0.721
10.6	Smart Border Initiative e (France, Germany)	Enedis - Distribution System Operator; Energis Netzgesellschaft mbH Distribution System Operator (part of Innogy SE)	Under consideration	2020	On time		No change compared to last year (33.1)	N/A

Annex V: Reported investment costs vs. reference values – gas

Parameter / Variable	Assumption in this Report	Comment
- Compressor drive technology (gas / electric)	Gas engine drive for all compressor stations.	Gas engine drive was the most common technology in the sample used for the UIC report
- Type of compressor (new / expansion)	New compressor stations only	Most compressor power is installed at new stations, although some PCIs are expansions of existing stations
- Treatment of offshore pipelines	UIC reference values are available for onshore pipelines only	Approx. 73% of the total length (km) of new PCI pipelines are on-shore, 8% are partially offshore, and 18% are offshore (from 2017 PCI monitoring report). The cost per km of offshore pipelines is generally higher, although strongly dependent on depth and seabed features (offshore pipelines in shallow waters are not necessarily more expensive per km than on-shore pipelines of similar diameter).
- Use of nominal/ indexes reference values	Use of "indexed" (inflation-adjusted) values	In the UIC report, "nominal" ("as observed" values or "indexed", i.e. inflation-adjusted) values are provided. For reference UIC values, the inflation-adjusted values to 2014 are considered to be a better cost proxy.
- Use of inflation since 2014	Reference values from UIC report (inflated until 2014)[181]	HICP[182] inflation rate during years 2014-2018 in EU was low (0.5% in 2014, 0% in 2015, 0.3% in 2016, 1.7 in 2017 and 1.9 in 2018), as published by Eurostat. Inflation was not considered for 2014-2018 due to these low values observed. Moreover, there is no compelling evidence of a strong correlation among general inflation and the price levels for gas infrastructure projects.
- Non-normalised diameters	Approximation to immediately higher normalised diameter size	UIC are available for pipes of diameters measured in inches, while promoters provided this info in millimetres. In case of a mismatch or non-existence of a "normalised" diameter in inches, the closest higher value in inches was used.

[181] In the UIC report, cost values of the collected sample of historic cost of gas infrastructure (from years 2005 to 2014) were converted to year 2014 values by using general consumer price index.
[182] Harmonised Indices of Consumer Prices as published by Eurostat.

Annex VI: PCIs not included in the NDPs – gas

PCI code	2017 PCI name	Date of first inclusion in an NDP	Reasoning provided
5.1.2	Upgrade of the SNIP (Scotland to Northern Ireland) pipeline to accommodate physical reverse flow between Ballylumford and Twynholm	None provided	No answer provided
5.4.1[183]	Interconnection ES-PT (3rd interconnection) – 1st phase	None provided	The project was not included in the last NDP of Spain that was published in 2008. The NDP was prepared at an earlier date and the project will be proposed for inclusion in the next NDP. The project was identified later on, and was selected as PCI by the EC in 2013, 2015 & 2017. It is being considered in the High Level Group on Interconnections for South-West Europe.
5.4.2[184]	Interconnection ES-PT (3rd interconnection) – 2nd phase	None provided	The project was not included in the last NDP that was published in 2008. The NDP was prepared at an earlier date and the project will be proposed for inclusion in the next NDP. The project was identified later on, and was selected as PCI by the EC in 2013, 2015 & 2017. It is being considered in the High Level Group on Interconnections for South-West Europe.
6.20.3	South Kavala UGS facility and metering and regulating station (EL)	None provided	The project is an enabler for the development of a UGS at the depleted field of South Kavala. Its inclusion in the NDP is subject to the decision of the UGS promoter to go ahead with their project.
6.24.1	ROHUAT/BRUA – 1st phase, including: - Romanian-Hungarian reverse flow: Hungarian section 1st stage compressor station at Csanádpalota - Development of the transmission capacity in Romania from Podișor to Recas, including, a new pipeline, metering station andthree new compressor stations in Podisor, Bibesti and Jupa - GCA Mosonmagyarovar	None provided	No answer provided

[183] Portuguese NRA comment: The Portuguese NDP was approved in December 2108. This project was included in the TSO's NDP proposal but not on the approved NDP. Nevertheless, it is expected that it will be re-evaluated in the next NDP exercise.

184 Portuguese NRA comment: This project was not included in the TSO's NDP proposal related to the 2018-2027 horizon.

PCI code	2017 PCI name	Date of first inclusion in an NDP	Reasoning provided
	compressor station (development on the Austrian side)		
6.25.1	Pipeline system from Bulgaria via Romania and Hungary to Slovakia [currently known as "Eastring"]	None provided	The NDP was prepared at an earlier date and the project will be proposed for inclusion in the next NDP.
6.8.1	Interconnection Greece — Bulgaria [currently known as "IGB"] between Komotini (EL) and Stara Zagora (BG) and compressor station at Kipi (EL)	None provided	No answer provided
6.9.1	LNG terminal in northern Greece	None provided	1) The project is an enabler for project LNG-N-062 (Northern Greece LNG - FSRU-terminal). It will be proposed to be included in the NDP subject to the FID for the enabled project. 2) The Project is a private Independent Natural Gas System. GASTRADE submitted an application to DESFA on 19.06.2018 for the connection of the Project with the NNGTS. The application has been approved and the Project will be included in the next NDP (1H2019).
7.1.1	Gas pipeline to the EU from Turkmenistan and Azerbaijan, via Georgia and Turkey, [currently known as the combination of "Trans-Caspian Gas Pipeline" (TCP), "South-Caucasus Pipeline FutureExpansion" (SCPFX) and "Trans Anatolia Natural Gas Pipeline" (TANAP)]	None provided	No NDP exists in the countries, nor are the operators required to prepare and publish a NDP.
7.1.3	Gas pipeline from Greece to Italy via Albania and the Adriatic Sea [currently known as "Trans-Adriatic Pipeline" (TAP)], including metering and regulating	None provided	TAP Project is being developed on a standalone basis, independent from the national transmission systems of Greece, Italy and Albania.

PCI code	2017 PCI name	Date of first inclusion in an NDP	Reasoning provided
	station and compressor station at Nea Messimvria		
7.3.1	Pipeline from the East Mediterranean gas reserves to Greece mainland via Crete [currently known as "EastMed Pipeline"], with metering and regulating station at Megalopoli	None provided	The project is intended to connect the East Med pipeline to the Greek Gas Transmission System. It will be included in the NDP when the East-Med project will reach a higher degree of maturity.
7.5	Development of gas infrastructure in Cyprus [currently known as "Cyprus Gas2EU"]	None provided	Information not disclosed.
8.1.1[185]	Interconnection Estonia - Finland [currently known as "Balticconnector"]	None provided	The project is currently not included in a public NDP by virtue of the legal transition towards a liberalised gas market by 2020. Finland has availed itself of the possibility to derogate from certain provisions pursuant to Article 49 of the Third Gas Market Directive. In the beginning of 2020, when the Balticconnector gas pipeline is commissioned, the application of Article 49 will no longer be justified as the new transmission capacity is a prerequisite for an effective opening of Finland's isolated natural gas market. EU Third Energy Package provisions regarding a fully functional and competitive gas market has been mainly transposed into national law through the reformed Natural Gas Market Act. The remaining provisions will enter into force 1 January 2020.

Note: 3 additional PCIs reported not to disclose this information

[185] ELERING (Project promoter comment): The interconnection project is currently under construction.

Annex VII: PCIs without any activity in 2018 – gas

PCI Code / TYNDP code	PCI Name[186]	Status vs. schedule
6.10 / TRA-F-137	5.2.2 Gas Interconnection Bulgaria - Serbia	Delayed
6.20.3 / TRA-N-1092	South Kavala UGS facility and metering and regulating station (EL) **An enabler** (the installation of a M/R station in order to allow the connection of the South Kavala UGS with the Greek National Natural Gas Transmission System.) **for the development of a UGS at the depleted field of South Kavala**	Rescheduled
6.24.10 TRA-N-959	ROHUAT/BRUA – 3rd phase, including: - Enhancement of the Romanian transmission system between Onesti-Isaccea and reverse flow at Isaccea - Enhancement of the Romanian transmission system between Onesti – Nadlac - Extension of the Romanian transmission system for taking over gas from the Black Sea shore	On time
6.26.1 / TRA-N-094	Cluster Croatia — Slovenia — Austria at Rogatec, including: - Interconnection Croatia — Slovenia (Lučko — Zabok - Rogatec) - ***Compressor station Kidričevo, 2nd phase of upgrade (SI)*** - Compressor stations 2 and 3 at the Croatian gas transmission system - GCA 2015/08: Entry/Exit Murfeld (AT) - Upgrade of Murfeld/Ceršak interconnection (AT-SI) - Upgrade of Rogatec interconnection	Rescheduled
7.3.1 / TRA-N-1091	Pipeline from the East Mediterranean gas reserves to Greece mainland via Crete [currently known as "EastMed Pipeline"], with ***metering and regulating station at Megalopoli***	Rescheduled

[186] A single PCI code may refer to several investment items, each one with a unique TYNDP code. Where a PCI includes several such items, for some of which work has been performed while for others no work has been carried out, the item(s) on which no work is reported is indicated in ***bold italic***.

Annex VIII: PCI specific information - gas

2017 PCI number	2017 PCI name	2017 TYNDP code(s)	Project promoter(s)	Current status	Expected commissioning year	Current PCI progress	Total investment costs in 2019 (million €)
5.1.1	Physical reverse flow at Moffat interconnection point (IE/UK)	TRA-N-1064; TRA-N-829	GNI (UK) Limited	Under consideration	2022	On time	119
5.1.2	Upgrade of the SNIP (Scotland to Northern Ireland) pipeline to accommodate physical reverse flow between Ballylumford and Twynholm	TRA-N-027	Premier Transmission; Mutual Energy Limited	Under consideration	2022	Delayed	60
5.1.3	Development of the Islandmagee Underground Gas Storage (UGS) facility at Larne (Northern Ireland)	UGS-N-294	Infrastrata PLC	Permitting	2022	On time	350
5.10	Reverse flow interconnection on TENP pipeline in Germany	TRA-F-208	Open Grid Europe GmbH; Fluxys TENP GmbH	Under construction	2020	Delayed	67
5.11	Reverse flow interconnection between Italy and Switzerland at Passo Gries interconnection point	TRA-F-214	Snam Rete Gas	Under construction	2018	On time	738
5.19	Connection of Malta to the European gas network — pipeline interconnection with Italy at Gela	TRA-N-031	Ministry for Energy and Water Management (MT)	Permitting	2024	On time	414.46
5.21	Adaptation low to high calorific gas in France and Belgium	TRA-N-429; TRA-N-500	GRTgaz; Storengy France; Fluxys Belgium SA/NV	Permitting	2026	On time	181
5.3	Shannon LNG Terminal and connecting pipeline (IE)	LNG-N-030	Shannon LNG Ltd	Permitting	2022	On time	628

2017 PCI number	2017 PCI name	2017 TYNDP code(s)	Project promoter(s)	Current status	Expected commissioning year	Current PCI progress	Total investment costs in 2019 (million €)
5.4.1	Interconnection ES-PT (3rd interconnection) – 1st phase	TRA-N-283; TRA-N-168	REN Gasodutos, SA; Enagás Transporte, S.A.U.	Planned but not yet in permitting[187]	2025	Delayed	189.6
5.4.2	Interconnection ES-PT (3rd interconnection) – 2nd phase	TRA-N-284; TRA-N-729; TRA-N-285	REN Gasodutos, SA; Enagás Transporte, S.A.U.	Under consideration	2028	Rescheduled	581.5
5.5.1	South Transit East Pyrenees [currently known as "STEP"]	TRA-N-161; TRA-N-252	Enagás Transporte, S.A.U.; TIGF	Under consideration[188]	2022	On time / Delayed	442
5.5.2	Eastern Gas Axis Spain — France — interconnection point between Iberian Peninsula and France, including the compressor stations at St-Avit, Palleau and St. Martin de Crau [currently known as "Midcat"]	TRA-N-727; TRA-N-256	Enagás Transporte, S.A.U.; TIGF; GRTgaz	Under consideration[189]	2024	On time	3068.7
6.10	PCI Gas interconnection Bulgaria — Serbia [currently known as "IBS"]	TRA-F-137	Ministry of Energy of Bulgaria	Permitting	2022	Delayed	49
6.2.1	Poland — Slovakia interconnection	TRA-N-190; TRA-N-275	Eustream; Operator Gazociagów Przesylowych Gaz-System S.A.	Permitting	2021	On time	287
6.2.10	Poland – Czech Republic interconnection [currently known as "Stork II"]	TRA-N-273	Operator Gazociagów Przesylowych Gaz-System S.A.	Permitting	2022	Rescheduled	397

[187] Spanish NRA (CNMC) considers the project as “under consideration”, since the current interconnection capacity between Portugal and Spain is underutilized.
[188] Spanish NRA (CNMC) considers this project as “under revision” since it is not mature enough.
[189] Spanish NRA (CNMC) considers this project as “discarded” since promoters have not presented it as a candidate for the 2019 PCIs list.

2017 PCI number	2017 PCI name	2017 TYNDP code(s)	Project promoter(s)	Current status	Expected commissioning year	Current PCI progress	Total investment costs in 2019 (million €)
6.2.11	North – South Gas Corridor in Western Poland	TRA-N-247	Operator Gazociagów Przesylowych Gaz-System S.A.	Under construction	2020	On time	283
6.2.12	Tvrdonice-Libhošť pipeline, including upgrade of CS Břeclav (CZ)	TRA-N-136	NET4GAS; Operator Gazociagów Przesylowych Gaz-System S.A.	Permitting	2022	On time	257.14
6.2.13	Increase of the transmission capacity at the Slovakia – Hungary interconnection	TRA-N-636; TRA-N-524	Magyar Gáz Tranzit Zrt.	Under consideration	2022	On time	58.64
6.2.14	Enhancement of the Hungarian transmission system between Vecsés and Városföld required for the increased capacity at the Slovakia-Hungary interconnection	TRA-N-831	Magyar Gáz Tranzit Zrt.	Under consideration	2022	Rescheduled	80
6.2.2	North – South Gas Corridor in Eastern Poland	TRA-N-245	Operator Gazociagów Przesylowych Gaz-System S.A.	Permitting	2022	Rescheduled	1204
6.20.2	Chiren UGS expansion (BG)	UGS-N-138	Bulgartransgaz EAD	Permitting	2025	Delayed	237.977
6.20.3	South Kavala UGS facility and metering and regulating station (EL)	TRA-N-1092; UGS-N-385	Hellenic Gas Transmission System Operator S.A.; Hellenic Republic Asset Development Fund S.A.	Under consideration	2023	Rescheduled	327.5
6.20.4	Depomures storage in Romania	UGS-N-233	ENGIE Romania	Under construction	2024	Delayed	87
6.20.6	Sarmasel underground gas storage in Romania	UGS-N-371	S.N.G.N. ROMGAZ S.A.	Under consideration	2024	Rescheduled	136.15
6.23	Hungary – Slovenia interconnection (Nagykanizsa —	TRA-N-112; TRA-N-325	Plinovodi d.o.o.; FGSZ Ltd.	Under consideration	2025	Rescheduled	313.9

2017 PCI number	2017 PCI name	2017 TYNDP code(s)	Project promoter(s)	Current status	Expected commissioning year	Current PCI progress	Total investment costs in 2019 (million €)
	Tornyiszentmiklós (HU) — Lendava (SI) – Kidričevo)						
6.24.1	ROHUAT/BRUA – 1st phase, including: - Romanian-Hungarian reverse flow: Hungarian section 1st stage compressor station at Csanádpalota - Development of the transmission capacity in Romania from Podișor to Recas, including, a new pipeline, metering station andthree new compressor stations in Podisor, Bibesti and Jupa - GCA Mosonmagyarovar compressor station (development on the Austrian side)	TRA-N-358; TRA-N-423, TRA-N-286	SNTGN Transgaz SA; GAS CONNECT AUSTRIA GmbH; FGSZ Ltd.	Planned but not yet in permitting	2024	On time / Rescheduled	646.69
6.24.10	ROHUAT/BRUA – 3rd phase, including: - Enhancement of the Romanian transmission system between Onesti-Isaccea and reverse flow at Isaccea - Enhancement of the Romanian transmission system between Onesti – Nadlac - Extension of the Romanian transmission system for taking over gas from the Black Sea shore	TRA-N-964; TRA-N-139; TRA-N-959	SNTGN Transgaz SA	Under consideration	2023	On time	640.14

2017 PCI number	2017 PCI name	2017 TYNDP code(s)	Project promoter(s)	Current status	Expected commissioning year	Current PCI progress	Total investment costs in 2019 (million €)
6.24.4	ROHUAT/BRUA –2nd phase, including: - Városföld-Ercsi– Győr pipeline (HU) - Ercsi-Százhalombatta pipeline (HU) - Városföld compressor station (HU) - Expansion of the transmission capacity in Romania from Recas to Horia towards Hungary up to 4.4 bcm/a and expansion of the compressor stations in Podisor, Bibesti and Jupa - Black Sea shore — Podișor (RO) pipeline for taking over the Black sea gas - Romanian-Hungarian reverse flow: Hungarian section 2nd stage compressor station at Csanádpalota or Algyő (HU)	TRA-N-362; TRA-N-018; TRA-N-061; TRA-N-377; TRA-N-123	SNTGN Transgaz SA; FGSZ Ltd.	Under consideration	2024	On time / Delayed	798.014
6.25.1	Pipeline system from Bulgaria via Romania and Hungary to Slovakia [currently known as "Eastring"]	TRA-N-654; TRA-N-628; TRA-N-656; TRA-N-655	Bulgartransgaz EAD; Eastring B.V.; Eustream; FGSZ Ltd.; SNTGN Transgaz SA	Under consideration	2028	On time / Rescheduled	1974.56
6.25.4	Infrastructure to allow the development of the Bulgarian gas hub	TRA-N-592; TRA-N-593; TRA-N-594	Bulgartransgaz EAD	Under consideration	2022	On time	1771.59

2017 PCI number	2017 PCI name	2017 TYNDP code(s)	Project promoter(s)	Current status	Expected commissioning year	Current PCI progress	Total investment costs in 2019 (million €)
6.26.1	Cluster Croatia — Slovenia — Austria at Rogatec, including: - Interconnection Croatia — Slovenia (Lučko — Zabok - Rogatec) - Compressor station Kidričevo, 2nd phase of upgrade (SI) - Compressor stations 2 and 3 at the Croatian gas transmission system - GCA 2015/08: Entry/Exit Murfeld (AT) - Upgrade of Murfeld/Ceršak interconnection (AT-SI) - Upgrade of Rogatec interconnection	TRA-N-094; TRA-N-361; TRA-F-86; TRA-N-389; TRA-N-390; TRA-N-1057	Plinovodi d.o.o.; GAS CONNECT AUSTRIA GmbH; Plinacro Ltd	Planned but not yet in permitting	2023	On time / Rescheduled	217.635
6.4	PCI Bidirectional Austrian — Czech interconnection (BACI) between Baumgarten (AT) – Reinthal (CZ/AT) — Břeclav (CZ), with capacity up to 6.57 bcm/a	TRA-N-133; TRA-N-021	NET4GAS, s.r.o.; GAS CONNECT AUSTRIA GmbH	Planned but not yet in permitting	2024	Rescheduled	199.9
6.5.1	Development of a LNG terminal in Krk (HR) up to 2.6 bcm/a– Phase I and connecting pipeline Omišalj – Zlobin (HR)	LNG-N-082; TRA-N-90	LNG Hrvatska d.o.o.; Plinacro Ltd	Permitting	2021	Rescheduled	268.6
6.5.5	"Compressor station 1" at the Croatian gas transmission system	TRA-F-334	Plinacro Ltd	Under construction	2019	On time	25
6.5.6	Expansion of LNG terminal in Krk (HR) above 2.6 bcm/a – Phase II	TRA-N-075; TRA-N-1058	Plinacro Ltd	Permitting	2025	Rescheduled	282.15

2017 PCI number	2017 PCI name	2017 TYNDP code(s)	Project promoter(s)	Current status	Expected commissioning year	Current PCI progress	Total investment costs in 2019 (million €)
	and evacuation pipelines Zlobin – Bosiljevo – Sisak – Kozarac – Slobodnica (HR)						
6.8.1	Interconnection Greece — Bulgaria [currently known as "IGB"] between Komotini (EL) and Stara Zagora (BG) and compressor station at Kipi (EL)	TRA-N-957; TRA-N-128; TRA-F-378	Hellenic Gas Transmission System Operator S.A.; ICGB a.d.	Under consideration	2020	Delayed / Rescheduled	310
6.8.2	Rehabilitation, modernization and expansion of the Bulgarian transmission system	TRA-N-298	Bulgartransgaz EAD	Permitting	2022	Delayed	339.588
6.9.1	LNG terminal in northern Greece	TRA-N-063; LNG-N-062; TRA-N-1090	GASTRADE SA; Hellenic Gas Transmission System Operator S.A.	Under consideration	2021	On time / Delayed	379.5
7.1.1	Gas pipeline to the EU from Turkmenistan and Azerbaijan, via Georgia and Turkey, [currently known as the combination of "Trans-Caspian Gas Pipeline" (TCP), "South-Caucasus Pipeline FutureExpansion" (SCPFX) and "Trans Anatolia Natural Gas Pipeline" (TANAP)]	TRA-N-339; TRA-F-221; TRA-N-1138	W-Stream Caspian Pipeline Company Limited; State Oil Company of the Republic of Azerbaijan (SOCAR); SOCAR Midstream Operations Ltd.	Planned but not yet in permitting	2023	On time / Delayed	8352.9
7.1.3	Gas pipeline from Greece to Italy via Albania and the Adriatic Sea [currently known as "Trans-Adriatic Pipeline" (TAP)], including metering and regulating station and compressor station at Nea Messimvria	TRA-N-971; TRA-F-051; TRA-N-941	Hellenic Gas Transmission System Operator S.A.; Trans Adriatic Pipeline AG	Under construction	2022	On time / Delayed	5472

2017 PCI number	2017 PCI name	2017 TYNDP code(s)	Project promoter(s)	Current status	Expected commissioning year	Current PCI progress	Total investment costs in 2019 (million €)
7.3.1	Pipeline from the East Mediterranean gas reserves to Greece mainland via Crete [currently known as "EastMed Pipeline"], with metering and regulating station at Megalopoli and dependent on it the following PCIs:	TRA-N-330; TRA-N-1091	Natural Gas Submarine Interconnector Greece-Italy Poseidon S.A; Hellenic Gas Transmission System Operator S.A.	Under consideration	2025	On time / Rescheduled	5207.5
7.3.3	Offshore gas pipeline connecting Greece and Italy [currently known as "Poseidon Pipeline"]	TRA-N-010	Natural Gas Submarine Interconnector Greece-Italy Poseidon S.A	Permitting	2023	On time	1096
7.3.4	Reinforcement of the South-North internal transmission capacities in Italy [currently known as "Adriatica Line"]	TRA-N-007	Snam Rete Gas	Under consideration	2026	Rescheduled	1384
7.5	Development of gas infrastructure in Cyprus [currently known as "Cyprus Gas2EU"]	TRA-N-1146	MECIT - Ministry of Energy,Commerce, Industry and Tourism	Permitting	2022	Rescheduled	272.784
8.1.1	Interconnection Estonia - Finland [currently known as “Balticconnector”]	TRA-N-928; TRA-N-895	Baltic Connector Oy; Elering AS	Under construction	2020	On time	264.122
8.2.1	Enhancement of Latvia — Lithuania interconnection	TRA-N-382; TRA-N-342	JSC Conexus Baltic Grid; AB Amber Grid	Under consideration	2023	Rescheduled	10.358
8.2.2	Enhancement of Estonia — Latvia interconnection	TRA-N-915	Elering AS	Under construction	2020	On time	46.84
8.2.4	Enhancement of Inčukalns Underground Gas Storage (LV)	UGS-N-374	JSC Conexus Baltic Grid	Permitting	2025	Rescheduled	130.9
8.3.1	Reinforcement of Nybro — Poland/Denmark Interconnection	TRA-N-780	Energinet.dk	Permitting	2022	On time	629

2017 PCI number	2017 PCI name	2017 TYNDP code(s)	Project promoter(s)	Current status	Expected commissioning year	Current PCI progress	Total investment costs in 2019 (million €)
8.3.2	Poland–Denmark interconnection [currently known as "Baltic Pipe"]	TRA-N-271; TRA-N-428	Operator Gazociagów Przesylowych Gaz-System S.A.; Energinet.dk	Permitting	2022	On time	784
8.5	Poland-Lithuania interconnection [currently known as "GIPL"]	TRA-N-212; TRA-N-341	Operator Gazociagów Przesylowych Gaz-System S.A.; AB Amber Grid	Permitting	2021	On time / Delayed[190]	497
8.6	Gothenburg LNG terminal in Sweden	LNG-N-032	Swedegas	Permitting	2022	Delayed	105
8.7	Capacity extension of Świnoujście LNG terminal in Poland	LNG-N-272	Operator Gazociagów Przesylowych Gaz-System S.A.	Permitting	2023	On time	191.52

[190] Lithuanian NRA comment: The GIPL project from Lithuania side will be implemented on time.

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