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Research Article

First-year application of the full EU taxonomy

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Abstract

This paper reports on the 2024 reporting practices under article 8 of the Taxonomy Regulation (EU 2020/852) by a sample of 62 listed companies from the European Union. Our research reveals significant differences in how our sample of companies implement the requirements, raising critical questions about comparability and in certain cases the usefulness of the information for the users of sustainability statements. While early diversity in practice is expected, the findings highlight the challenges and potential for improvement, supporting recent moves to simplify requirements as adopted in July 2025 by the European Commission.

Relevance to practice

By documenting significant variation in the way companies apply the taxonomy requirements, this paper may help practice to evolve towards greater comparability.

Keywords

EU taxonomy, sustainability, Omnibus

1. Introduction

The European Union (EU) taxonomy for sustainable activities has been presented by the European Commission as 'a cornerstone of the EU's sustainable finance framework and an important market transparency tool'.[1] The intention of the taxonomy is to allow businesses to assess the sustainability of their activities using a common set of criteria, and to report comparable statistics on the proportion of their activities that are classified as sustainable or potentially sustainable. This information should help investors to incorporate sustainability in their decisions, provide criteria for labeling financial instruments such as 'green bonds', and allow financial institutions to report on the proportion of sustainable investments in their portfolios. While a prominent example, the EU taxonomy is not the only one of its kind. Several other jurisdictions, among which China is the best known, have developed or are developing similar taxonomies (for examples, see World Bank (2020)).

Reporting under the EU taxonomy has been required, initially in a limited format, since the financial year 2022. The financial year 2024 has been the first year of mandatory application of the full requirements. It may also be the last in its current form. In the context of the 'Omnibus' proposals to reduce the administrative burden related to several pieces of EU sustainability legislation, the European Commission adopted simplifications of the requirements in July 2025, intended to be applicable as of the financial year 2025.

In this paper, we report on an investigation of the taxonomy reporting practices of a sample of 62 EU companies. We find that these practices show considerable variety, which is potentially concerning given the strong emphasis on comparability in the underlying rationale. However, some diversity in the early years of application is probably inevitable, and this paper may contribute to the development of more consistent practices. Some

of our findings align with or support the simplifications proposed by the European Commission. Assuming that the taxonomy will continue as a part of EU requirements, our paper identifies issues that will require attention from practice if the taxonomy is to achieve its intended objective of comparable information about sustainability.

This paper is organized as follows. Section 2 summarizes the regulatory context. In Section 3 we describe the composition of the sample and our approach to data collection. Section 4, in which we present our findings, is the core of the paper. Section 5 contains a discussion and conclusions.

2. Regulatory context

The EU taxonomy originated as part of the European Commission's sustainable finance agenda, in turn a response to the 2015 Paris Climate Agreement.[2] The Commission's 2018 Action Plan on Financing Sustainable Growth included the intention to develop an EU classification system or taxonomy for sustainable activities. This resulted in Regulation (EU) 2020/852, known as the Taxonomy Regulation, which describes the general principles of the EU taxonomy.

In essence, the Taxonomy Regulation identifies six environmental objectives:

- climate change mitigation;
- climate change adaptation;
- the sustainable use and protection of water and marine resources;
- the transition to a circular economy;
- pollution prevention and control;
- the protection and restoration of biodiversity and ecosystems.

Companies should assess for each of their activities whether they make a 'substantial contribution' to one or more of these objectives while they 'do no significant harm' (DNSH) to any of others. As this assessment is obviously not self-evident, the Regulation refers to 'technical screening criteria' to be developed by the Commission. In addition, activities can only be classified as sustainable if the company complies with 'minimum safeguards', that is, if it has procedures in place in line with several international guidelines and principles, including the OECD Guidelines for Multinational Enterprises and the UN Guiding Principles on Business and Human Rights.

More detailed requirements are included in three delegated acts and one complementary delegated act:

- Delegated Regulations (EU) 2021/2139 and (EU) 2023/2486, as amended by delegated regulation (EU) 2022/1274. These contain the technical screening criteria by which it can be ascertained that an activity 'contributes substantially' to one or more objectives and 'does no significant harm' to others. These criteria are mainly based on existing EU regulations and their underlying scientific rationale. The 2021 regulation covered the two climate objectives only. The 2022 amendment added technical screening criteria for economic activities in certain energy sectors. The 2023 regulation added criteria for the other four objectives. These regulations will jointly be referred to as the Delegated acts – environmental and climate.
- Delegated Regulation (EU) 2021/2178, which prescribes in more detail how a company should report on sustainable activities. It was amended by delegated regulation (EU) 2022/1274 with respect to the energy sectors covered by that amendment. It will be referred to as the Delegated act – disclosure.

The core of the reporting consists of Key Performance Indicators (KPI's), ratio's expressing the turnover or revenue, capital expenditure (CapEx) and operating expenditure (OpEx) of sustainable activities to the respective totals. These KPI's must be disclosed both for activities that meet the technical screening criteria and comply with minimum safeguards ('aligned activities') and activities that could potentially be sustainable but which do not yet meet the criteria ('eligible but not aligned'). The KPI's have to be reported in fairly complex tables for which strict mandatory templates are prescribed.

The taxonomy requirements have been phased in gradually. Over 2021, companies were required to report KPI's for eligible activities only, without assessing alignment. Over 2022, the requirement was extended to include alignment, but for the two climate-related objectives only. Over 2023, reporting was extended to include eligibility for the other four objectives, as well as for additionally defined activities for the climate objectives. The financial year 2024 was the first year for which full taxonomy information had to be given by all companies subject to the Corporate Sustainability Disclosure Directive (CSRD).

An important feature of the EU taxonomy is that it is not complete. The Delegated acts – environmental and climate list over 100 economic activities loosely based on the NACE industry classification (e.g. 'manufacture of cement', 'freight transport services by road') and describes for each what it means to 'contribute substantially' or to 'do no significant harm' to one or more of the six objectives. Sometimes these criteria are very specific to the activity, sometimes they are more generic. The list does not yet include all possible activities. Perhaps most notably, almost everything related to agriculture, food and drink is not listed and therefore by definition not eligible. Moreover, even if an activity is listed, it can only be assessed against objectives for which the Commission has developed criteria. For many activities, criteria have been defined only for one or two out of six objectives. For instance, it has been specified for just a few of the manufacturing activities how they could contribute to a circular economy, so that other manufacturing activities are by definition not eligible and cannot be aligned on the basis of this objective, although they may be eligible or aligned with respect to climate change.

The preceding summary is focused on non-financial undertakings. For financial undertakings, reporting requirements based on the taxonomy are significantly different, but outside the scope of this paper.

The taxonomy as enacted between 2020 and 2023 was called into question late in 2024 with the European Commission's reconsideration of its regulatory agenda on sustainability. The Omnibus proposals published in February 2025 left the basic approach of the taxonomy intact, but significantly restricted the scope of its application as only the largest companies were left within the scope of the CSRD. In the Omnibus, simplifications to the taxonomy were announced. These were made more specific in July 2025 when the Commission adopted amendments to the delegated acts. By the time of writing this paper, the period for scrutiny by the European Parliament had not yet passed but as proposed by the Commission the amendments will apply from financial year 2025 onwards. Some of the main simplifications are the introduction of materiality thresholds for KPI's (activities whose KPI's would represent less than 10% of their denominator do not have to be assessed or reported) and a simplification of the reporting templates. In addition, some of the more complex DNSH criteria will be simplified. The amendments retain the existing provision that permits operating expenditure to not be assessed for taxonomy eligibility or taxonomy alignment when it is not material for the entity's business model.

3. Data collection

For this paper, we constructed a sample of listed European companies reporting over the financial year 2024 under the Taxonomy Regulation. Our initial sampling universe consisted of companies included in the STOXX 600 Europe index. Using data from Sustainability Reporting Navigator[3] combined with data from Compustat we identified companies from the European Union with a 31 December financial year-end that had published a sustainability statement under the Corporate Sustainability Reporting Directive (CSRD) (or, in some member states where legislation implementing the CSRD had not yet taken effect, a nonfinancial statement based on the Nonfinancial Reporting Directive, NFRD)[4] over 2024 by 8 April 2025. To make observations about consistency of the application of the taxonomy within specific industries, we further selected those companies with a primary SIC-code occurring at least three times. We excluded investment companies and companies from the financial services industry. This resulted in a final sample of 62 companies from 13 industries, as shown in Appendix 1.[5]

We manually reviewed the taxonomy information in the selected reports using a scoring sheet based on the requirements of the Taxonomy Regulation and the delegated acts. Apart from gathering general descriptive information on taxonomy information and supporting footnotes, we used the scoring sheet to record the details of the disclosed KPI's at activity level in order to obtain a granular view of the information that is at the heart of the taxonomy philosophy. The scoring sheet was tested on a small initial selection of companies by several of the authors. This resulted in some clarifications and written instructions on the basis of which data collection was completed.

4. Findings

4.1. General reporting structure

Taxonomy information was included in all investigated reports. In 47 cases (76%), the taxonomy information was included in the environmental section of the sustainability statement, as required by ESRS 1 (para. 113). The other 15 cases (24%) reveal a variety of practices: presenting the taxonomy information elsewhere in the sustainability statement, or presenting a short introduction or just the narrative information in the (environmental section of the) sustainability statement while presenting the tables as an appendix either to the sustainability statement or to the annual report as a whole.

To describe the volume of taxonomy information we have looked at the number of pages and the number of words in the taxonomy section (or sections), excluding the tables. As can be seen in Table 1, this differs considerably across companies. On average, companies provide around five pages of narrative information to support the mandatory taxonomy tables. Four companies use one page or less; nine companies provide ten pages or more. Although it might be expected that the volume of explanatory material is related to the materiality of the eligible activities, this is not the case. There is no observable relationship between the number of words in the narrative section and the percentage of turnover classified as eligible.[6]

Table 1. Extent of taxonomy information (excluding mandatory tables).

	Average	Minimum	Median	Maximum
Number of pages	5.3	0.5	4.3	16
Number of words	2803	310	2326	10512

All companies use the required tables to report the KPI's (turnover, CapEx, OpEx) by activity. One company, which identified only one eligible activity, uses a slightly abbreviated version. Several companies present tables in a self-designed more compact format, apparently to enhance accessibility, while presenting tables in the required format in an appendix, either to the sustainability statement or the annual report as a whole. One company with both financial and non-financial activities presents separate taxonomy information for these two segments, as well as a consolidated group-level KPI in the form of a weighted average for the two segments in a single overview. This reporting format is in line with guidance by the European Commission in the form of frequently asked questions.[7]

In addition to the KPI templates, the Delegated act – disclosure prescribes a template table in which a company must answer yes or no to six questions on whether it carries out activities related to nuclear energy and fossil gas. If one or more questions are answered with yes, additional templates are prescribed for reporting eligible and aligned KPI's for these activities. The majority of companies (50 or 81%) provide this table. Of the 13 companies that do not, four include a note that this table would be irrelevant or that any such activities are immaterial. The remainder omit the table without comment. For companies that do not have nuclear or fossil gas activities, including a table with only 'no's' may indeed seem redundant. In its July 2025 modifications, the European Commission intends to eliminate this negative confirmation requirement. In our sample, 14 companies do report relevant activities. All but two of these provide the required supplementary tables.

4.2. Eligible and aligned activities

The key objective of the Taxonomy Regulation is to provide insight into the extent to which reporting entities' activities are sustainable. Table 2 provides a high-level summary, with a more detailed breakdown by industry in Appendix 2. Eligible activities (aligned or not) range from zero to 100% of the applicable denominator (turnover, CapEx, OpEx), with averages around 40%. These numbers are comparable with those found in earlier research by EY (2024) and KPMG (2024). As can be seen from Appendix 2, eligibility is clearly related to industry. This would be true in any taxonomy, but it is probably more pronounced in the EU taxonomy as the Taxonomy Regulation does not claim to be complete in its listing of eligible activities. In our sample, this notably affects the four brewery companies (malt beverages) who report 0% eligible revenue, not because their activity is inherently unsustainable, but because it is not yet covered by the Regulation. In contrast, pharmaceuticals, biological products (in our sample: biomedical) and motor vehicles show high levels of eligibility, at least for turnover (averages of 73% to 88%).

Table 2. Relative significance (% of relevant denominator) of eligible and aligned activities.

	Average	Min	Median	Max
Turnover				
Aligned (A1)	11%	0%	0%	65%
Eligible not aligned (A2)	31%	0%	11%	100%
Eligible (A1+A2)	42%	0%	37%	100%
CapEx				
Aligned (A1)	17%	0%	3%	93%
Eligible not aligned (A2)	27%	0%	10%	100%
Eligible (A1+A2)	45%	0%	35%	100%
OpEx				
Aligned (A1)	14%	0%	0%	88%
Eligible not aligned (A2)	26%	0%	11%	100%
Eligible (A1+A2)	39%	0%	22%	100%

*Percentages may not add up due to rounding.

For all three KPIs, alignment is relatively rare. While a few companies report high percentages of aligned activities, the median is zero or close to zero. Again, industry patterns are observable. For the automotive industry, for instance, high eligibility for turnover (average of 88%) translates into low alignment (10%), whereas for electric services the moderate level of eligibility (47%) represents aligned activities to a significant extent (37%).

The identification of eligible activities is clearly an important step in the application of the taxonomy. Table 3 provides high-level descriptives on the number of activities that the 62 companies in our sample have identified. It should be noted that a specific activity may be reported both under 'aligned' and under 'eligible not aligned' if a company decides that only part of the turnover (CapEx, OpEx) satisfies the criteria for alignment. For this reason, Table 3 does not show the number of unique activities identified. It can be seen from Table 3 that the frequency distribution of identified activities is heavily skewed. While many companies report no or just a few activities, some companies have gone to great lengths to identify activities. The two construction companies in the sample are outliers with between 25 and 43 activities identified as eligible and/or aligned for turnover and similar numbers for CapEx. Another five companies report ten or more activities as either eligible/not aligned or aligned for turnover. In addition to Table 3, it can be reported that 38 companies (61%) report at least one aligned activity for turnover, 47 (76%) at least one aligned activity for CapEx and 35 (56%) for OpEx.

Table 3. Number of identified activities.

	Average	Min	Median	Max
Turnover				
Aligned (A1)	4	0	1	28
Eligible not aligned (A2)	4	0	3	43
CapEx				
Aligned (A1)	4	0	2	32
Eligible not aligned (A2)	6	0	4	34
OpEx				
Aligned (A1)	3	0	1	16
Eligible not aligned (A2)	3	0	2	25

As suggested by Table 3, the identification of activities does not have to be identical across the three KPI's, and it does in fact vary considerably. It is reasonable to assume that a revenue-generating activity will often also require capital expenditure and operating expenditure, so that considerable overlap in activities across the three KPI's is expected. In fact, a few companies (especially with just one or two identified activities) do seem to interpret the taxonomy in this way, so that they report CapEx and OpEx KPI's only for those activities for which they also report turnover KPI's. However, the taxonomy allows for differences, e.g. when companies invest in activities that do not, or do not yet, generate revenue. Most companies have applied the taxonomy in this way, with the result that, in round numbers, for every instance in which both

turnover and capital expenditure are reported for the same activity, there are 1.2 other instances of activities for which only one of the two is reported. For turnover/OpEx and CapEx/OpEx the differences are somewhat greater.[8]

A good example of these differences is that 30 companies (48%) report 'transport by motorbikes, passenger cars and light commercial vehicles' under CapEx as eligible with respect to the climate change mitigation objective (a combination referred to as CCM 6.5, based on the Delegated acts – environmental and climate).[9] Only seven (11%) report a turnover KPI for this activity, suggesting that most have thought in terms of transport as a supporting rather than revenue-generating activity. Of course, this raises the question whether the 32 companies that do not report a CapEx KPI really did not invest in this type of transport at all in 2024 and 2023, have applied a materiality judgment (see Section 4.3) or simply haven't thought about it. Similar observations could be made about CCM 7.7. 'acquisition and ownership of buildings'. One would expect that most companies own at least some buildings, yet eligible CapEx is reported by 21 companies or 34% (eligible turnover by three or 5%). While it is possible that some companies did indeed not invest at all in buildings during the year, these results do suggest that, apart from materiality, there exist quite fundamental differences of opinion with respect to how this kind of supporting activities should be handled under the taxonomy.

As indicated in Section 2, the six objectives differ in the number of activities for which substantial contribution criteria have been defined: 94 and 100 for climate change mitigation and adaptation, respectively, but 21 for circular economy, 6 each for pollution prevention and water and marine resources, and 2 for biodiversity. It is therefore to be expected that most reported KPI's relate to the climate change objectives. This is borne out by Table 4, which shows the number of reported KPI's, across all companies, by sustainability objective.

Table 4. Total number of reported KPIs across all companies by sustainability objective.

	CCM	CCA	WTR	PPC	CE	BIO
Turnover						
Eligible not-aligned (A2)	205	5	2	19	43	2
Aligned (A1)	210	3	3	3	23	0
Total	415	8	5	22	66	2
CapEx						
Eligible not-aligned (A2)	302	9	0	15	28	2
Aligned (A1)	243	2	3	3	18	1
Total	545	11	3	18	46	3
OpEx						
Eligible not-aligned (A2)	164	11	0	16	20	0
Aligned (A1)	146	1	0	3	12	0
Total	310	12	0	19	32	0

CCM: climate change mitigation;
CCA: climate change adaptation;
WTR: sustainable use and protection of water and marine resources;
PPC: pollution prevention and control;
CE: transition to a circular economy;
BIO: protection and restoration of biodiversity and ecosystems.

It is clear from Table 4 that the vast majority of KPI's are reported in connection with the two climate change objectives. The only other objective that generates a substantial number of KPI's is circular economy. The water/marine resources and biodiversity objectives are reported so infrequently as to raise the question whether it is meaningful to keep them in the taxonomy at all (other than for assessing no significant harm), if the number of activities for which screening criteria are defined cannot be increased.

However, increasing the number of potentially eligible activities for each objective creates a potential problem of double eligibility (one activity is potentially aligned with two or more objectives). This is handled in principle in the Delegated act – disclosure by the requirement that a company should in such a case mention both objectives in the relevant activity row in the templates (e.g. CCM 7.1 / CE 3.1, both referring to 'construction of new buildings), allocate the turnover (CapEx, Opex) to the two activities, show the most important activity in bold in the template, and provide a separate table showing aggregated KPI's by objective. In practice, only a minority of 15 companies (24%) report at least one activity contributing to more than one objective in their templates. One might also raise the question what incentives companies have to assess activities against multiple objectives, as this will not further increase the KPI's.

As an example, one might, perhaps, expect a significant overlap between climate change mitigation and climate change adaptation. However, the two objectives are rather different. Whereas climate change mitigation refers essentially to the company's impact on climate change, climate change adaptation refers to the resilience of the company's activities to the consequences of climate change. This means that for the activity CCM/CCA 4.3, electricity generation from wind power, the substantial contribution criterion for CCM is very simple: it has just to be shown that the activity generates electricity from wind power. For climate change adaptation, however, it would have to be shown that the climate risks associated with the activity have been systematically assessed using science-based best practices, and that appropriate and proportional adaptation solutions have been implemented. One wonders what company would want to do the necessary paperwork if it has already been ascertained that the revenue (CapEx, OpEx) of this activity is aligned for climate change mitigation purposes. While it would be easy to claim simple eligibility for activities covered both by climate change mitigation and climate change adaptation, it would still require some effort to allocate turnover (CapEx, OpEx). These costs without clear benefits would seem to explain why companies mainly report on climate change mitigation and hardly anything on climate change adaptation. In one case did a company report all its eligible activities under the climate change adaptation objective, whereas its industry peers all reported broadly similar activities under climate change mitigation. The explanatory notes of the first company were not extensive enough to see whether this truly reflected a different assessment, or that it was an error.

4.3. Materiality

That materiality considerations do, in practice, seem to have influenced the application of the taxonomy has been suggested above. One company states explicitly that 'the concept of materiality established for financial reporting' has been used to determine taxonomy-eligible activities. However, the Delegated act – disclosure, as applicable in 2024, does not include general materiality thresholds for identifying and reporting activities. Disclosure of OpEx KPI's may be omitted, though, if operational expenditure is not material for the business model of a non-financial undertaking (Annex I, 1.1.3.2). The delegated act defines a rather specific definition of operating expenditure as, essentially, non-capitalized research and development costs and non-capitalized expenditure for day-to-day servicing of property, plant and equipment. This is likely to be a relatively small fraction of what many companies and users of financial statements think of as operating expenditure. Nine companies (15%) make use of this materiality exemption for OpEx. There appears to be some diversity among these companies in whether they assess the materiality of taxonomy-defined OpEx for eligible activities relative to a general definition of operating expenditure for these eligible activities, or whether they assess the materiality of taxonomy-defined OpEx for eligible activities relative to taxonomy-defined OpEx for non-eligible activities. In our view, the usefulness of information on this specific definition of OpEx is not evident.

A general impression of the materiality of reported KPI's is given in Table 5, which lists the total number of activities reported in the templates as either eligible/non-aligned or aligned, and with a positive amount. With some variation between the three categories, the main finding is that around two-thirds of reported numbers are less than 1% of the relevant denominator. Around 12% has a value of 10% or more of the relevant denominator.[10] Companies report not just the currency amounts of the KPI's but also show them as a percentage of turnover (CapEx, OpEx). Even though some companies present these percentages with one or two decimals, many amounts are so small that, because of rounding, reported percentages of 0% (0.0%, 0.00%) make up about one-third of all reported KPI's (not tabulated in Table 5). In combination with the observations about diversity of practice regarding supporting activities, this suggests considerable diversity in terms of whether and how companies have applied a materiality threshold. Some clearly have not, whereas others who probably did invest in own buildings or motor transport, may well have done so. The European Commission's proposal to adopt a 10% threshold will provide more clarity and, as suggested by Table 5, will lead to a very significant reduction in the number of reported datapoints. In our sample, 15 companies (24%) would not have reported any KPI's across the three categories over 2024 if this threshold had been applied.

Table 5. Total number of reported KPIs across all companies.

	Total datapoints	Of which >= 10% of denominator	Of which < 1% of denominator
Turnover	518	51 (10%)	364 (70%)
CapEx	626	74 (12%)	412 (66%)
OpEx	373	54 (14%)	214 (57%)
All KPI's	1517	179 (12%)	990 (65%)

4.4. Taxonomy notes

Because of the prescribed templates, companies have little discretion over how they report the KPI's. They have more discretion regarding the accompanying notes, other than presenting summary tables in addition to tables based on the templates (see Section 4.1). The Delegated act – disclosure (Annex I, para. 1.2) requires explanation of accounting policies (determination of the numerators and denominators of the KPI's and the relation to financial statement numbers); explanation of the assessment of eligibility and alignment; and contextual information explaining the reported KPIs and changes therein. The Delegated act includes quite detailed requirements for these explanations which are not necessarily easy to apply in the absence of a clearly defined materiality threshold. There may be significant and specific judgments underlying each individual reported datapoint, including the allocation of CapEx to activities and the assessment of alignment based on technical screening criteria specific to an activity. Providing meaningful notes may be possible in case of just a few activities, but will be challenging when reporting on ten or more. As reported in Table 1, companies have made very divergent choices in the amount of footnote information they provide, and the same is true for choices with regard to content. This makes it hard to provide meaningful descriptive statistics or best practices that are generalizable across companies. We make a number of qualitative observations.

Most companies have not made apparent attempts to make their taxonomy notes attractive or accessible, the most common format being plain text. Figure 1, in contrast, is an example of using the kind of graphics that are common in the rest of companies' management reports.

The Delegated act – disclosure (Annex I, para. 1.2.2.1) requires companies to 'describe the nature of their Taxonomy-eligible and Taxonomy-aligned economic activities'. In our view, users of the information are best served by information that relates entity-specific activity descriptions to the activity descriptions in the taxonomy, including the numerical coding for ease of reference. While this can be done in narrative format, a tabular format may be suitable if there are more than a few activities (Figure 2).

A few companies affected by the incompleteness of the taxonomy include a brief comment, for instance as follows: '[N]on-eligible actives under the EU Taxonomy should not be interpreted as an indication of AB InBev's sustainability performance or ambition. Additionally, the company would expect these key performance indicators to substantially increase if and when the specific

Figure 1. Summary presentation of taxonomy assessment (ASML, annual report 2024, p. 251).

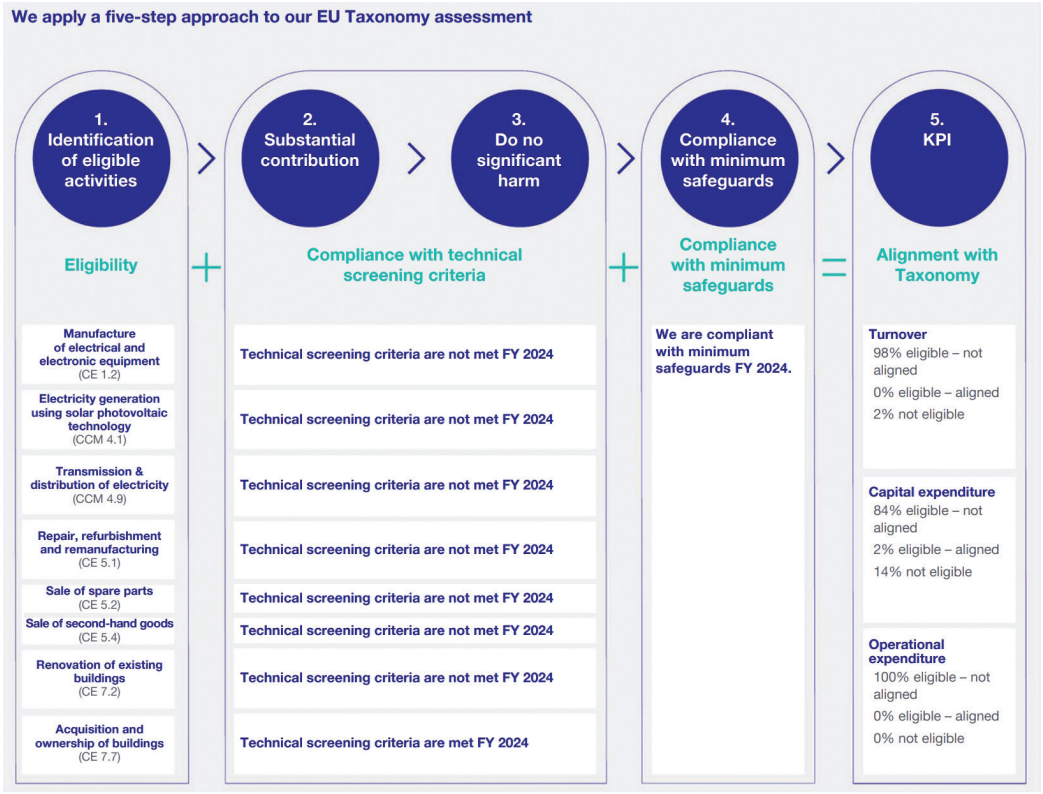

Figure 2. Identification of eligible activities (Orange, universal registration document 2024, p. 403, table partially reproduced).

The Orange activities generating revenues eligible through the classification of economic activities included in the EU taxonomy are as follows:

Environmental objective	Activity included in the EU taxonomy	Definition of the activity	Corresponding Orange activity
Climate change mitigation	8.1 Data processing, hosting and related activities	Storage, manipulation, management, movement, control, display, switching, interchange, transmission or processing of data through Data centers, including edge computing	Hosting and data processing services
	8.2 Data-driven solutions for GHG emissions reductions	Development or use of ICT (Information and Communication Technologies) solutions that are aimed at recovering, transmitting and storing data and its modeling and use where those activities are predominantly aimed at the provision of data and analytics enabling GHG emissions reductions.	Services in relation to the Internet of Things
	7.4 Installation, maintenance and repair of charging stations for electrified vehicles in buildings (and parking spaces attached to buildings)	Installation, maintenance and repair of charging stations for electrified vehicles in buildings and parking spaces attached to buildings.	Offer to install charging stations for Orange Polska customers
	7.6. Installation, maintenance and repair of renewable energy technologies	Installation, maintenance and repair of renewable energy technologies, on-site.	Offer to install solar panels and heat pumps for Orange Polska customers Sale of solar kits to customers by some entities in MEA zone

economic activity "manufacturing of food products and beverages" is added to the Delegated Regulations.' (AB InBev, Annual report 2024, p. 160). One company adds three pages of text to discuss the sustainability of activities not yet covered by the taxonomy or that would be hard to include because their interaction with other activities would make it difficult to calculate meaningful KPIs (Amadeus, Non-financial information statement and sustainability information 2024, p. 57–60).

Explaining the extent to which eligible activities are aligned requires in principle an explanation of the three steps: making a substantial contribution, doing no significant harm, and complying with minimal safeguards. Disclosures on this point range from the simple to the elaborate. Companies that report no aligned activities sometimes disclose the reasons summarily. A few companies report that they lack the required data or have not yet finished their assessments and therefore report 0%

aligned. Other companies describe generic processes applied across all activities, or limit themselves to a general summary of the taxonomy criteria without specific application to their own activities. The European Commission has published 'Frequently Asked Questions' about application of the taxonomy, in particular the technical screening criteria. In our sample, 20 companies (32%) mention these FAQs in their notes, mainly as a general reference.

Some companies use long texts to describe taxonomy assessment, which is inevitable if a company with many different activities wishes to comply fully with the requirements of the Delegated act – disclosures. A problem here is that for some activities the technical screening criteria are concise and for others very complex and technical. This can make it difficult to create a balanced text, as illustrated in Figure 3. This shows how one company reports on the assessment of the substantial contribution of two different activities (out of eight) to climate change mitigation. The first text block shows activity 3.17, manufacture of plastics in primary form, which is an example of detailed criteria in technical language. The disclosure begins by citing the text of one of three alternative criteria listed in the Delegated act, followed by an application to the company's activities (starting with the sentence 'In this context ...). The second text block shows activity 4.1. electricity generation using solar photovoltaic technology. Here the criterion is simply that the activity generates electricity using solar photovoltaic technology, and the company needs to do no more than repeat this as an assertion. The example can be seen as best practice in the sense of being specific about each activity and tailoring the specificity of information provided about each activity to the degree of detail in the screening criteria. However, another question is what level of detail is required to make this information most helpful to users.

A different approach is taken by another company. This company, with 17 identified eligible activities (including 3.17 and 4.1 as in Figure 3) grouped the sometimes different substantial contribution criteria with respect to climate change in five broad categories, so that the result of the compliance tests can be shown in tabular form (Figure 4).

Figure 3. Explanation of substantial contribution (ENI, annual report 2024, p. 233, 235).

Substantial contribution to climate change mitigation

For the assessment of substantial contribution to climate change mitigation, criterion c) related to activity 3.17 as stated in EU Regulation 2021/2139 was applied, as follows: c) derived in whole or in part from renewable raw materials, and the greenhouse gas emissions over their life cycle are lower than the greenhouse gas emissions in the life cycle of equivalent primary form plastics manufactured from fossil fuels. Greenhouse gas emissions over the life cycle are calculated using Recommendation 2013/179/EU or, alternatively, ISO 14067:2018 or ISO 14064-1:2018. Greenhouse gas emissions quantified over the life cycle are verified by an independent third party. Agricultural biomass used for manufacturing of plastics in primary form meets the criteria of Article 29, paragraphs 2 to 5, of Directive (EU) 2018/2001. Forest biomass used for manufacturing of plastics in primary form meets the criteria of Article 29, paragraphs 6 to 7, of the same directive.
In this context, chemicals derived from hydrocarbons were identified as equivalent to resins and plastics derived in whole or in part from renewable raw materials. These equivalent chemicals were identified considering chemical equivalence in terms of composition and equivalence in the chemical family. For both product lines, the hydrocarbon-derived equivalent is PBAT. Subsequently, emissions from Novamont's activity and the hydrocarbon equivalent were calculated based on the Life Cycle Thinking methodology, which includes all stages of their respective supply chains (procurement, processing, transportation, and disposal). This analysis confirmed compliance with the stated criterion "c" of the Taxonomy.

Substantial contribution to climate change mitigation

The activity generates electricity using solar PV technology.

Figure 4. Explanation of substantial contribution (Repsol, Integrated Management Report 2024, p. 219).

	Nature of the activity	GHG emissions savings	GHG emissions generation	Energy density threshold	Regulatory compliance
3.10. Hydrogen production [1]		✓			
3.14. Manufacture of basic chemical products [2]			✗		
3.17. Manufacture of plastics in primary forms (recycled polyols and polyolefins) [3]			✓		
3.17. Manufacture of plastics in primary forms (other polyols and polyolefins) [4]			✗		
4.1. Generation of electricity using solar photovoltaic technology [5]	✓				
4.3. Generation of electricity from wind power [6]	✓				
4.5. Generation of electricity from hydroelectric power [7]	✓		✓	✓	
4.10. Electricity storage [8]	✓				
4.13. Production of biogas and biofuels for the transport and production of bioliquids [9]		✓			
4.29. Generation of electricity from gaseous fossil fuels [10]			✗		
4.30. High-efficiency cogeneration of heat/cold and power from gaseous fossil fuels [11]			✗		
5.12. Permanent underground geological storage of CO_2 [12]					✓
6.15. Infrastructure enabling road transport and low-carbon public transport [13]	✓				
7.6. Installation, maintenance and repair of renewable energy technologies [14]	✓				
8.2. Data-driven solutions to reduce GHG emissions [15]	✓				
9.1 Close to market research, development and innovation [16]	✓				
9.2 Research, development and innovation for direct capture of CO_2 from the atmosphere [17]	✓				

As with substantial contribution, disclosures on doing no significant harm differ considerably, both because of variation in the specificity of the requirements in the Delegated act and because of companies' choices to use specific or generic language. For most activities in the taxonomy, the do no significant harm criterion with respect to water and marine resources is formulated in the same way, so that for most companies it would be possible to report on this criterion across activities. Figure 5 gives an example of how this can be done in a succinct yet entity-specific manner. Without literally repeating the requirements, the disclosure does address them in substance.

Figure 5. Explanation of Do No Significant Harm (Konecranes, annual report (governance and financial review) 2024, p. 79.

Sustainable use and protection of water and marine resources

Konecranes has water management practices in place, such as the ISO 14001 management system, and other internal processes and policies. According to a study done using the WWF Water Risk Filter tool, Konecranes has no manufacturing sites in "Extremely High" water stress areas. Only two of Konecranes' sites located in high-risk areas use water in their production processes. For example, the site in Jejuri, India, has countermeasures in place, such as a closed-loop system for the water used in the production process and a sewage treatment plant.

Disclosures on the minimum safeguards tend to be limited. This is partly explained by companies omitting further discussion once it has been established that none of their activities meets both the substantial contribution and the do no significant harm criteria. Some companies that do report aligned activities simply assert that minimum safeguards have been complied with. Others provide some more information, for instance by indicating that international standards such as OECD Guidelines have been incorporated in the company's own code of conduct and/or in contracts with suppliers. We note as best practice that some companies make negative assertions such as the following: 'Fortum (or senior management) has not been found to have violated labour law, human rights, or competition laws. Fortum has also not been found guilty of tax evasion, corruption or bribery.' (Fortum, Financials 2024, p. 77).

4.5. Assurance

While not the main focus of this paper, we offer some observations on assurance. For information based on the Taxonomy Regulation, as well as for the sustainability statement as a whole, the CSRD requires limited assurance by an independent assurance provider. All companies include an assurance report on the sustainability statement. All reports were issued by audit firms,[11] mainly (58 or 94%) the so-called Big-4.

In most cases, this is a report on limited assurance as required under the CSRD.[12] In nine cases (15%), though, the report is a combination of a limited assurance report including also a reasonable assurance opinion on identified elements of the sustainability statement, typically on specific metrics reported under ESRS. Only in two of these cases does the reasonable assurance opinion also include part or all of the taxonomy information.

All assurance reports mention the taxonomy information separately in the scope paragraph, as well as in the opinion paragraph. Other than that, they differ considerably in the amount of detail provided on taxonomy information. French reports have a separate section on the taxonomy information. Danish reports tend to use highly standardized language across audit firms. Some reports merely include a bullet item on taxonomy information in the 'work performed' paragraph. Others also touch on taxonomy information in other paragraphs such as 'responsibility of management' or 'our responsibility'.

5. Discussion and recommendations

Given that the taxonomy requirements have been phased in over several years, it is not surprising to find that all companies in our sample have included taxonomy information in their 2024 annual reports. What is perhaps more surprising is that the observed reporting practices still suggest differences of view on quite fundamental aspects of the taxonomy. Notably, companies apparently differ in the extent to which they identify eligible activities for turnover independently from the identification of eligibility for CapEx/OpEx and, within the CapEx category, how they deal with supporting activities such as real estate. Also, there appears to be significant variation in the application of materiality in identifying eligible activities and/or reporting KPI's for aligned activities.

We note relatively low levels of alignment, with averages below 20% of the relevant denominators that are flattered by skewed distributions. Of course, up to a point this may simply reflect that companies still need to make a significant effort to improve their sustainability. However, it also reflects low eligibility (averages of less than 50%), which is at least in part the result of an incomplete taxonomy. Although we have not investigated this in detail, low alignment may also be a sign that some of the technical screening criteria are too complex, at least in terms of the required documentation. Some companies in our sample did report non-alignment because of difficulties in gathering the necessary data. We note, anecdotally, that there is uncertainty in practice over issues such as whether lessees of buildings can rely on building permits that comply with relevant legislation, or that they should conduct their own assessment of such compliance. In general, the fact that the European Commission considered it necessary to issue several batches of Frequently Asked Questions, many related to the technical screening criteria, is indicative of the challenges of ensuring that a taxonomy such as this one results in comparable information across companies.

It could not be expected that the implementation of this type of complex regulation would be flawless during the first few years, so allowance has to be made for learning. That said, we believe that the current state of affairs is not

satisfactory, both with respect to diversity of application and with respect to the incompleteness of the taxonomy. In our view, it would be premature to conclude that the taxonomy already results in information that can meaningfully be compared across companies, let alone across industries. It has been observed that financial institutions, a key group of intended users of taxonomy information, do not yet use taxonomy information for strategic purposes (PwC 2025, p. 21). While we can see the basic rationale of the taxonomy, especially once the KPI's will be tagged using XBRL, the European Commission should make an effort to make the taxonomy a more balanced instrument.

The simplifications proposed in July 2025 will help, and we believe that an explicit, quantitative materiality threshold will be an improvement. However, we believe it is important that the Commission remains focused on the long-term viability of the taxonomy rather than on short-term simplifications. An expansion of the number of eligible activities, at any rate to cover the more glaring omissions, remains necessary.

In addition to the simplifications proposed by the Commission, we propose that the reporting of OpEx KPIs be abandoned. To our knowledge, it is not seen as useful in practice. The definition of OpEx is very limited and unrelated to common understandings of operating expenditures. Whereas the CapEx KPI's have a conceptual justification as predictors of future sustainable revenue for the corresponding activities, this is not credible for OpEx as defined in the taxonomy. If OpEx is abandoned, it might be considered to add non-capitalized expenditure on research and development to CapEx.

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Notes

1. https://finance.ec.europa.eu/sustainable-finance/tools-and-standards/eu-taxonomy-sustainable-activities_en, consulted 17 July 2025.
2. For reviews of the regulatory context and regulatory process, see Garcia-Torea et al. (2024); Hummel and Jobst (2024). For literature reviews on the EU taxonomy, see Tettamanzi et al. (2024); Brabec and Macháč (2025).
3. https://www.srnav.com/.
4. Under the CSRD, the inclusion of taxonomy information in the sustainability statement is based on ESRS 1, para. 113. Under the NFRD, the inclusion of taxonomy information in the nonfinancial statement is based on Communication from the Commission 2019/C 209/01 'Guidelines on non-financial reporting: Supplement on reporting climate-related information'. For brevity, we refer to 'sustainability statement' only.
5. In two minor adjustments, one company from code 1600 was eliminated, leaving only two companies in that industry. DSM-Firmenich was added to code 2800 even though it is domiciled outside the EU.
6. Correlation of .05.
7. Commission Notice on the interpretation and implementation of certain legal provisions of the Disclosures Delegated Act under Article 8 of the EU Taxonomy Regulation on the reporting of Taxonomy-eligible and Taxonomy-aligned economic activities and assets (third Commission Notice) (C/2024/6691), 8 November 2024, FAQ 9.
8. These indicative numbers are calculated as follows. In our sample, 43 activities (out of the total of over 200) are reported by at least one company as eligible but not aligned for revenue. This provides a matrix of 43 * 62 = 2,666 potential combinations. Of these, only about 10% are actually used in the sample. A similar matrix can be made for CapEx, which shows a partially different set of activities that are actually reported. Combination of the two matrices shows that, out of all possible company/activity combinations for eligible but non-aligned activities, 3.15% are cases where a company reports both turnover and CapEx for that activity. 3.82% are cases where the company reports only one of the two, and the rest of the combinations are not observed at all. We compare the 3.82% with the 3.15%. For Turnover/OpEx the numbers are 2.34% and 3.26%; for CapEx/OpEx 2.98% and 3.97%. Similar calculations could be made for aligned activities.
9. Only 6 (10%) also report aligned CapEx for CCM 6.5.
10. It should be noted that these percentages have been calculated separately for 'aligned' and 'eligible-not aligned', not for the two combined.
11. As opposed to other independent assurance service providers (IASPs), as allowed as a member state option under the CSRD. Of the countries represented in our sample, only Denmark and France have used the IASP option, according to information provided by Accountancy Europe (https://accountancyeurope.eu/publications/csrd-transposition-tracker/ consulted on 17 July 2025).

12. Under the NFRD, 'verification' of the nonfinancial statement could be required as a member state option.

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Appendix 1

Table A1. Company sample by SIC Code.

Industry (SIC code)/company name	Domicile
Heavy construction (1600)	
Ferrovial SE	NLD
Vinci SA	FRA
Malt beverages (2082)	
Anheuser-Busch Inbev SA/NV	BEL
Carlsberg A/S	DNK
Heineken NV	NLD
Royal Unibrew A/S	DNK
Chemicals and allied products / Industrial inorganic chemicals (2800/2810)	
BASF SE	DEU
Bayer AG	DEU
DSM-Firmenich AG	CH-NLD
Evonik Industries AF	DEU
Kemira OYJ	FIN
Lanxess AG	DEU
L'Air Liquide SA	FRA
Pharmaceutical preparations (2834)	
Merck KGaA	DEU
Novo Nordisk A/S	DNK
Orion OYJ	FIN
Sanofi SA	FRA
UCB SA	BEL
Biological products (2836)	
Alk-Abello A/S	DNK
Argen-X SE	NLD
Bavarian Nordic A/S	DNK
GENMAB AS	DNK
Grifols SA	ESP
Petroleum refining (2911)	
ENI SPA	ITA
Repsol SA	ESP
TotalEnergies SE	FRA
Construction, mining & materials handling machinery & equipment (3530)	
Kalmar OYJ	FIN
Kone OYJ	FIN
Konecranes OYJ	FIN

Industry (SIC code)/company name	Domicile
Special industry machinery (3559)	
Aixtron SE	DEU
ASM International NV	NLD
ASML Holding NV	NLD
FLSmidth & CO A/S	DNK
Motor vehicles and passenger car bodies (3711)	
Bayerische Motoren Werke AG	DEU
Dr Ing H.C.F. Porsche AG	DEU
Ferrari NV	NLD
Iveco Group NV	NLD
Mercedes Benz Group AG	DEU
Renault SA	FRA
Stellantis NV	NLD
Volkswagen AG	DEU
Radiotelephone communications (4812)	
Elisa OYJ	FIN
Freenet AG	DEU
Telefonica SA	ESP
Deutsche Telekom AG	DEU
Koninklijke KPN NV	NLD
Orange SA	FRA
Telia Company AB	SWE
Electric services (4911)	
EDP SA	PRT
Endesa SA	ESP
ENGIE SA	FRA
Fortm OYJ	FIN
Iberdrola SA	ESP
RWE AG	DEU
Verbund AG	AUT
Computer programming, data processing (7370)	
Amadeus IT Group SA	ESP
Capgemini SE	FRA
Sopra Steria Group SA	FRA
Tietoevry OYJ	FIN
Prepackaged software (7372)	
CD Projekt SA	POL
Dassault Systèmes SE	FRA
SAP SE	DEU

Appendix 2

Table A2. Relative significance (% of relevant denominator) of eligible and aligned activities by industry.

		Turnover			CapEx			OpEx		
		A2	A1	A2+A1	A2	A1	A2+A1	A2	A1	A2+A1
Heavy construction (1600)	Avg.	16%	26%	42%	9%	23%	32%	0%	0%	0%
	Min	13%	18%	36%	7%	12%	23%	0%	0%	0%
	Median	16%	26%	42%	9%	23%	32%	0%	0%	0%
	Max	18%	34%	47%	11%	35%	42%	0%	0%	0%
Malt beverages (2082)	Avg.	0%	0%	0%	14%	0%	14%	6%	0%	6%
	Min	0%	0%	0%	1%	0%	2%	0%	0%	0%
	Median	0%	0%	0%	13%	0%	13%	4%	0%	4%
	Max	0%	0%	0%	31%	1%	31%	15%	1%	15%
Chemicals and allied products (2800/ 2810)	Avg.	13%	0%	13%	14%	2%	15%	7%	0%	7%
	Min	0%	0%	1%	1%	0%	1%	0%	0%	0%
	Median	11%	0%	12%	17%	0%	17%	9%	0%	10%
	Max	39%	1%	39%	22%	7%	25%	15%	2%	15%
Pharmaceutical preparations (2834)	Avg.	78%	0%	78%	56%	1%	57%	44%	0%	44%
	Min	29%	0%	29%	5%	0%	5%	1%	0%	1%
	Median	93%	0%	93%	51%	0%	51%	23%	0%	23%
	Max	100%	0%	100%	99%	3%	100%	100%	0%	100%
Biological products (2836)	Avg.	73%	0%	73%	37%	0%	37%	56%	0%	56%
	Min	8%	0%	8%	1%	0%	1%	0%	0%	0%
	Median	96%	0%	96%	19%	0%	19%	61%	0%	61%
	Max	100%	0%	100%	100%	0%	100%	100%	0%	100%
Petroleum refining (2911)	Avg.	6%	1%	7%	6%	21%	27%	10%	7%	17%
	Min	5%	1%	6%	3%	8%	10%	8%	4%	16%
	Median	5%	1%	7%	5%	15%	21%	9%	7%	18%
	Max	6%	2%	7%	10%	40%	50%	14%	10%	18%
Construction, mining & materials handling machinery (3530)	Avg.	5%	44%	49%	10%	14%	24%	1%	16%	17%
	Min	0%	41%	41%	0%	0%	13%	0%	0%	0%
	Median	1%	44%	46%	0%	13%	28%	1%	15%	16%
	Max	14%	47%	61%	31%	28%	31%	1%	33%	34%
Special industry machinery (3559)	Avg.	52%	19%	71%	53%	19%	72%	57%	21%	78%
	Min	0%	0%	30%	1%	0%	37%	4%	0%	33%
	Median	56%	5%	78%	59%	3%	80%	62%	4%	91%
	Max	98%	65%	98%	92%	72%	92%	100%	77%	100%
Motor vehicles and passenger car bodies (3711)	Avg.	78%	10%	88%	64%	26%	90%	59%	30%	89%
	Min	46%	0%	57%	20%	0%	40%	9%	0%	22%
	Median	83%	12%	93%	70%	28%	99%	61%	34%	100%
	Max	90%	15%	100%	92%	41%	100%	100%	44%	100%
Radiotelephone communications (4812)	Avg.	2%	2%	4%	4%	2%	6%	15%	1%	16%
	Min	0%	0%	0%	2%	0%	2%	0%	0%	0%
	Median	2%	1%	2%	3%	1%	5%	9%	0%	10%
	Max	3%	8%	11%	6%	7%	10%	47%	3%	50%
Electric services (4911)	Avg.	9%	38%	47%	3%	81%	84%	16%	60%	75%
	Min	0%	19%	24%	1%	62%	67%	3%	13%	43%
	Median	6%	45%	49%	2%	89%	90%	12%	75%	78%
	Max	30%	56%	62%	7%	93%	96%	42%	88%	95%
Computer programming, data processing (7370)	Avg.	7%	0%	7%	33%	11%	44%	8%	0%	8%
	Min	2%	0%	2%	2%	0%	2%	0%	0%	0%
	Median	5%	0%	5%	35%	4%	56%	5%	0%	5%
	Max	16%	0%	16%	62%	34%	63%	21%	1%	22%
Prepackaged software (7372)	Avg.	28%	12%	40%	37%	1%	38%	16%	8%	25%
	Min	0%	0%	0%	0%	0%	0%	0%	0%	0%
	Median	35%	0%	49%	37%	0%	41%	21%	0%	21%
	Max	49%	35%	70%	74%	4%	74%	28%	24%	53%

A1: Eligible and aligned.
A2: Eligible, not aligned.
A1+A2: Total eligible, aligned or not.