

PFAS disclosure practices of Dutch listed companies: An exploratory study

Olga Ihl-Deviv'e, Thomas Thijssens

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Abstract

Per- and polyfluoroalkyl substances (PFAS) are widely used chemicals increasingly linked to harmful effects on human health and the environment. Although considered a major global environmental threat and subject to growing regulatory scrutiny, PFAS are not explicitly addressed in sustainability reporting frameworks, and research on corporate PFAS reporting is lacking. This study examines PFAS disclosure in 432 annual reports from Dutch listed companies (2019–2024). PFAS reporting is rare: only 19% of firms (8% of reports) mentions PFAS, mainly in infrastructure, construction, and advanced manufacturing. Disclosures seldom provide metrics, or receive assurance, and in only 1 report (0.002% of reports) PFAS is explicitly identified as a material topic. Given the growing regulatory, litigation, and reputational landscape, it appears unlikely that PFAS would truly be immaterial for virtually all sample companies. Rather, the non-disclosure likely reflects methodological limitations, significant data gaps, and the absence of standardized, PFAS-specific disclosure requirement.

Relevance to practice

For firms, our results suggest they should integrate PFAS into materiality, risk management, and sustainability governance, to be accountable to their stakeholders regarding this major societal threat. Regulators could strengthen PFAS-related disclosure by issuing interpretative guidance and developing sector-specific guidance. In addition, providing illustrative implementation examples or best-practice disclosures could support companies in operationalizing PFAS reporting.

Keywords

PFAS, CSRD, ESRS, sustainability reporting

1. Introduction

Per- and polyfluoroalkyl substances (PFAS) are chemicals that have been widely used in consumer and industrial products in the past decades. Due to their chemical stability, grease- and water-repellent and heat-resistant qualities, they have become an essential part of a wide range of products, such as lubricants, textiles, cosmetics, food packaging, pesticides, and firefighting foam. However, research increasingly finds evidence for the hazardous properties of PFAS and the damaging effects on humans and the environment (e.g., Ackerman Grunfeld

et al. 2024; Evich et al. 2022; Sonne et al. 2023; Zahm et al. 2024). Thus, PFAS are currently considered one of the major environmental threats in the world (UNEP 2025). Economic costs for PFAS cleanup in the next years are estimated to potentially exceed USD 1.6 trillion in Europe and the UK (The Forever Pollution Project n.d.). There are several international initiatives to restrict or eliminate their use. For example, some specific PFAS have been banned already in the EU, and early 2023, the Netherlands, together with Germany, Denmark, Sweden,

and Norway submitted a proposal for the restriction of all PFAS in the entire EU to the European Chemicals Agency (ECHA n.d.). And on January 12th 2026, new rules entered into application, requiring EU member states to monitor PFAS-levels in drinking water, to assure compliance with the recast Drinking Water Directive (Directorate-General for Environment 2026).

Notwithstanding the importance of the topic, PFAS are not explicitly mentioned in sustainability reporting frameworks, such as the mandatory European Sustainability Reporting Standards (ESRS). Moreover, currently no studies exist on corporate PFAS reporting. The goal of this study is to explore whether, and the extent to which Dutch listed companies report on PFAS.

To do so, we analyzed the annual reports of 75 companies, listed on the Dutch main stock indexes (AEX, AMX, AScX) for the years 2019–2024, resulting in 432 firm-year observations. Our analysis reveals that corporate reporting on PFAS is rather limited. Only 34 reports (approximately 8%) mention PFAS at least once, corresponding to just 14 unique firms. PFAS disclosures are highly concentrated: a small group of firms – most notably Arcadis and BAM Group – account for more than 30% of all PFAS-disclosing reports, while several large listed firms refer to PFAS only once or not at all. Disclosure activity is uneven across industries and is primarily observed in infrastructure, construction, industrial services, and advanced manufacturing. Substantive disclosures remain largely qualitative, with an average of 3.4 PFAS references per report, and virtually no quantitative metrics on PFAS use or emissions. PFAS is explicitly identified as a material topic in only one report, no firm reports PFAS-related metrics, and only one firm integrates PFAS into target setting or governance structures. While 82% of PFAS-disclosing reports discuss PFAS as a risk or opportunity, these discussions rarely translate into concrete policies, actions, or measurable commitments. To further examine PFAS disclosure behavior, we conduct an industry-level analysis comparing firms operating in industries with high PFAS materiality to those in industries where PFAS is considered less material. The results indicate that PFAS disclosures are more prevalent among firms operating in high-materiality industries, yet overall disclosure levels remain relatively limited. In addition, we find that firms operating in industries with high PFAS materiality tend to integrate PFAS-related information more into their operations, policies, and corporate governance structures. By contrast, firms operating in industries with low PFAS materiality more frequently emphasize PFAS-related business opportunities and the resulting competitive advantages. Overall, the findings point to a substantial gap between the recognized environmental and regulatory significance of PFAS and their treatment in Dutch corporate reporting. This suggests that, next to deliberate secrecy, non-disclosure may reflect differences in firms' resources and internal capabilities to identify and monitor PFAS across complex value chains. In addition, firms may differ in their assessments

of PFAS materiality or face varying levels of direct exposure, which can influence whether the issue is considered sufficiently relevant to warrant disclosure.

2. Literature review

2.1. Voluntary sustainability reporting: drivers and limitations

Early sustainability reporting emerged largely as a voluntary practice, driven by stakeholder and institutional pressures, legitimacy concerns, and economic considerations (Hahn and Kühnen 2013). A substantial body of literature examines the determinants of voluntary sustainability reporting and finds that firm size, industry affiliation, visibility, and stakeholder scrutiny are among the most consistent predictors of disclosure (Hahn and Kühnen 2013; Dienes et al. 2016; Arkoh et al. 2024). Firms operating in environmentally sensitive industries are more likely to engage in sustainability reporting, reflecting higher exposure to environmental risks and reputational concerns (Velte 2023).

However, prior research consistently documents important limitations of voluntary reporting. Disclosures tend to be selective, qualitative, and focused on positive aspects of corporate performance, while negative impacts and controversial issues are often omitted or downplayed (Hahn and Kühnen 2013; Dienes et al. 2016). This has raised concerns about symbolic reporting and greenwashing, particularly when firms face weak regulatory oversight or when reporting frameworks provide broad discretion (e.g., Luu et al. 2025; Mateo-Márquez et al. 2022). As a result, voluntary sustainability reporting often fails to provide comparable, decision-useful information to stakeholders (Christensen et al. 2021).

2.2. The shift toward mandatory sustainability reporting

In response to the shortcomings of voluntary disclosure, regulators increasingly rely on mandatory sustainability reporting regimes. There is evidence that mandatory sustainability reporting can lead to improvements in environmental and social outcomes. For example, mandatory disclosure has been associated with reductions in greenhouse gas emissions, improved workplace safety, and increased investment in sustainable practices (Delmas et al. 2010; Benneer and Olmstead 2008; Chen et al. 2018; Downar et al. 2021). Related research also shows spillover effects along supply chains and across borders, suggesting that disclosure mandates can influence behavior beyond directly regulated firms (She 2022; Kim et al. 2025). In addition, mandatory sustainability reporting is found to be value relevant. Importantly, firms with stronger sustainability performance and more credible disclosures tend to benefit from mandatory regimes, whereas firms with poor performance or low transparency may face negative market reactions (Baboukardos 2017; Grewal et al. 2019; Jouvenot and Krueger 2019; Mittelbach-Hörmanseder et al. 2021; Vishnu Nampoothiri et al. 2024).

2.3. Mandatory reporting and disclosure quality

Previous studies also examine how mandatory rules affect the quantity and quality of sustainability disclosures. Empirical evidence from various European countries shows that mandatory sustainability reporting leads to a significant increase in the volume of disclosed information (Larrinaga et al. 2002; Chauvey et al. 2015; Venturelli et al. 2019; Korca et al. 2021). However, improvements in disclosure quality are often limited. Firms frequently do not fully comply with regulatory requirements, rely on boilerplate language, and avoid disclosing negative or sensitive information (Fallan and Fallan 2009; Chauvey et al. 2015). Recent work further suggests that enforcement plays a critical role in determining whether mandatory reporting leads to meaningful transparency (Haase and Hitz 2025; Donau and Müller 2025). Without strong enforcement and clear guidance, mandatory sustainability reporting risks replicating the limitations of voluntary disclosure, albeit on a larger scale.

2.4. Emerging risks and the limits of current frameworks

Numerous scientific studies increasingly document the persistence, toxicity, and widespread environmental contamination associated with PFAS, as well as substantial long-term economic and health costs (Evich et al. 2022; Sonne et al. 2023; Ackerman Grunfeld et al. 2024; Zahm et al. 2024). Despite their growing relevance, PFAS are not explicitly referenced in major sustainability reporting standards such as the GRI and the ESRS (GRI 2021; EFRAG 2023). Instead, PFAS fall implicitly under broader categories such as substances of very high concern, which form part of ESRS E2 pollution. Prior research suggests that such implicit treatment reduces disclosure, particularly for complex, technical, and legally sensitive topics (Abraham and Shrivies 2014; Melloni et al. 2016). As a result, firms may formally comply with mandatory reporting requirements while omitting important, or even material information on emerging threats.

2.5. Research gap and contribution

To date, no empirical studies have examined corporate PFAS reporting. This absence is striking given the increasing regulatory attention at both EU and national levels. By examining PFAS disclosures of Dutch listed companies over time, this study addresses a clear gap in the sustainability reporting literature. It contributes to ongoing debates on voluntary versus mandatory reporting by showing how principle-based mandatory regimes may fail to capture emerging environmental risks when explicit guidance is lacking. In doing so, the study extends prior research on the limits of sustainability disclosure regulation and highlights PFAS as a critical test case for the effectiveness of the CSRD and ESRS.

3. Institutional context: the Netherlands

3.1. Sustainability reporting legislation in the Netherlands

Being an EU-member state, The Netherlands has mandatory reporting rules, stemming from EU-directives. As EU directives are legal acts stating a goal, without dictating how those goals must be met, it requires member states to implement and enforce the directive in their national laws. In recent years, two sustainability reporting directives have been implemented in Dutch Law: the Non-Financial Reporting Directive (NFRD) and the Corporate Sustainability Reporting Directive (CSRD).

NFRD

The NFRD (Directive 2014/95/EU) was adopted in 2014. It applied to large (more than 500 employees) public interest entities (PIEs): listed companies, and companies in the financial sector, such as banks and insurance companies. The NFRD required companies to provide in their management report information on at least the following topics: environment, social and employee matters, respect for human rights, combating corruption and bribery, and diversity in management. It also mandated the types of information that must be disclosed: policies and their outcomes, related risk (management), and KPIs. However, it was built upon broad principles, not detailed rules, allowing companies to choose reporting frameworks, such as the GRI (EPRS 2021). The principle-based nature is also reflected in the implicit way in which the NFRD refers to materiality. It states that companies must disclose “to the extent necessary for an understanding of the company’s development, performance, position and impact of its activity”. This refers to the relevance of information, both for the company itself and its environment, introducing the principles of respectively financial materiality and impact materiality. In the Netherlands, the NFRD was implemented into Dutch Law in 2016 and applied to information for fiscal years starting in 2018 and published in 2019.

CSRD

The CSRD (Directive (EU) 2022/2464), part of the European Green Deal, was adopted in 2022 and currently applies. It requires that companies report their ESG practices in the management report of their annual reports. For this, they need to consider both their own activities and the activities of their value chain partners. One of the basic principles of CSRD is the concept of ‘double materiality’. As described in the previous paragraph, this concept was implicitly also included in the NFRD, however the CSRD refers explicitly to it. It means that companies must assess which sustainability issues carry the most

weight for both company and its stakeholders (Brans et al. 2024). Impact materiality considers the impact of a company on its environment. Financial materiality is about the impact of the environment on the company, e.g. the influence of climate change on the business model. Companies must report on material topics in line with the European Sustainability Reporting Standards (ESRS).

Under the original CSRD, sustainability reporting obligations are introduced in a phased manner based on company size and listing status. Large listed companies that were already subject to the Non-Financial Reporting Directive – i.e., public-interest entities with more than 500 employees – are required to apply to the CSRD for financial years starting in 2024, with the first reports published in 2025; these are the so-called ‘Wave 1’ firms. Other large companies (i.e., two of three criteria are exceeded: (1) € 25 M balance sheet total, (2) € 50 M net turnover, and (3) 250 employees) are required to report for financial years starting in 2025, with first publication in 2026; these are Wave 2 firms. Listed small and medium-sized enterprises, excluding micro-entities, (Wave 3 firms) are brought into scope for financial years starting in 2026 with reporting in 2027, while retaining the option to defer their initial reporting until the 2028 financial year, published in 2029.

Omnibus

However, in early 2025 the European Commission proposed the ‘Omnibus’ overhaul. This is a package of coordinated EU legislative amendments to simplify and revise sustainability-related laws, including the CSRD (European Commission 2024). These changes include higher thresholds for both size (1,000 employees) and net turnover (€ 450M) that would reduce the overall scope, and the exemption of smaller companies under these new thresholds. The Omnibus also includes a delay in the timing for Wave 2 and 3 companies under the CSRD. The overhaul was approved by the European Parliament in December 2025.

Currently, most companies in the main Dutch indexes (AEX, AMX and AScX) are ‘Wave 1’ companies, for which the Omnibus has no direct consequences. The other index constituents are ‘Wave 2’ companies, that would originally have to bring their 2025 reports –published in 2026 – in accordance with the CSRD, but for which the Omnibus results in a delay of approximately 2 years. It may even be the case that some of the smallest (AScX listed) ‘Wave 2’ companies may be exempted.

Current reporting landscape

To clarify the reporting landscape, it is important to note that the absence of explicit references to PFAS in regulations and reporting frameworks does not imply the absence of such disclosure requirements. Under the CSRD, companies are required to report on topics that are either financially material or impact-material in accordance with the ESRS. Similarly, under the NFRD, which applies to the 2019–2024 reports analyzed in this study,

companies are required to disclose environmental information “to the extent necessary for an understanding of the company’s development, performance, position and impact of its activity.” This reflects a concept of double materiality comparable to that of the CSRD, implying that topics that are financially material (‘development, performance, position’) or impact-material (‘impact of its activity’) should be disclosed. In conclusion, if PFAS is considered financially or impact-material, companies are required to disclose information on this topic.

3.2. Dutch legislation and PFAS

PFAS are not mentioned in any of the relevant sustainability reporting directives (NFRD and CSRD), nor in the related Dutch laws. For concrete guidance in relation to its principle-based approach, the NFRD refers to reporting frameworks, such as the GRI. However, the GRI does not list PFAS or broader Substances of Very High Concern (SVHC) by name in the core disclosures either (GRI 2021). GRI and NFRD both stress the importance of materiality, implying that PFAS should be reported when they have material significance for their operations, risk profile, or stakeholder expectations. As for the CSRD, the main points of what must be reported are set out in the directive, whereas the details are set out in the European Sustainability Reporting Standards (ESRS). PFAS are not mentioned under the (sub-) topics of the ESRS; however, PFAS are increasingly considered to be Substances of Very High Concern (SVHC).¹ These are listed under ESRS E2 Pollution (see Table 1).

Table 1. An overview of the sub-topics in ESRS E2. (Source: EFRAG 2025).

Materiality is also crucial for the CSRD. If PFAS is a material environmental topic, a company would have to report several things under ESRS E2 Pollution (Brans et al. 2024; EFRAG 2025):

1. Disclosure of policies aimed at phasing-out, and substituting PFAS, and compliance with Dutch law.
2. Disclosure on the actions it takes in terms of e.g., supplier engagement, testing, and R&D.
3. Reduction targets with accompanying dates, next to the actual quantities of PFAS that are used or emitted or present in products and waste.

4. The company must give insight into risks and opportunities related to PFAS, including topics such as regulatory fines, liability, brand risk, and market opportunities for PFAS-free products.
5. Disclosure on board oversight and management responsibilities for PFAS, as well as skills and incentives related to managing PFAS are mandatory.

Yet, even if PFAS are not material, the company must disclose on its materiality assessment (ESRS 2 IRO-1), including the topics that were considered and assessed as non-material and on what basis (e.g., no PFAS use, no relevant emissions, no financial exposure, etc.). Moreover, if PFAS are considered a *potential* risk, cost or impact in the future they must be mentioned even if not material. Transparency on the materiality assessment and risk is even more relevant in countries like the Netherlands – where PFAS is increasingly regulated – and certain sectors for which PFAS are more relevant, due to activities such as real estate/construction, textiles, semiconductors, chemical manufacturing, and food packaging (Glüge et al. 2020). Next to pollution (ESRS E2), PFAS may also be relevant in terms of water contamination, hazardous waste, worker and community exposure and litigation or cleanup liabilities. Hence, when PFAS is material, reporting on PFAS may also occur under other ESRS standards, such as: E3 (Water & marine), E5 (Resource use & circularity), S1 (Own workforce), S2 (workers in value chain), S3 (affected communities).

Additional EU legislation

In addition to disclosure legislation, Dutch stock-listed companies that produce, use, import or trade PFAS-containing products are confronted with other legal frameworks. The EU has enacted strict regulations to phase out and control PFAS—through POPs, REACH, CLP, E-PRTR and a proposed EU-wide PFAS restriction – while additional directives are implemented nationally (Brans et al. 2024; ECHA 2023; Rijksoverheid.nl; RIVM n.d.). In the Netherlands these rules are enforced via the *Omgev-*

ingswet and *Arbowet*, which set permit, emission, quality, and worker-exposure requirements for PFAS. More details are presented in Appendix 1.

The above regulatory landscape shows that all Dutch stock-listed companies that are active with PFAS-containing products must – irrespective of whether PFAS is a material topic or CSRD applies – at a minimum maintain an administration of products containing PFAS.

4. Empirical results

4.1. Research sample and research methodology

For this study, the annual reports of 75 companies – 25 listed on the AEX, 25 on the AMX, and 25 on the AScX – were examined for the period 2019–2024. These three indices were selected to ensure balanced representation across large-cap, mid-cap, and small-cap firms in the Dutch market. An overview of the companies included in the analysis is presented in Appendix 2. In total, 432 annual reports were analyzed; any additional reports, such as standalone sustainability reports, were not included.

The 432 annual reports were examined for PFAS disclosures along three dimensions: (1) the presence of a PFAS disclosure, (2) the depth of the disclosure, and (3) its qualitative characteristics. First, we assessed whether each annual report mentioned PFAS at least once. Second, for the reports in which PFAS was mentioned, the depth was evaluated by counting the number of PFAS references within the document. Finally, the qualitative characteristics of the PFAS disclosures were analyzed using criteria derived from the assessment sheet developed on the basis of NFRD and CSRD guidelines, covering the following categories:

Accordingly, for all reports that contained a PFAS reference, we classified the disclosure into one of the categories outlined above.² In addition, we examined whether the PFAS disclosure appeared in an audited section of the annual report and, if so, what type of assurance was applied (limited or reasonable).

Box 1. Categories for classifying PFAS disclosures.

1. **Materiality:** Is PFAS considered a material topic?
2. **PFAS-related policies:** e.g., phase-out strategies, substitution efforts, compliance with REACH/EPA requirements;
3. **Actions:** e.g., supplier engagement, testing procedures, R&D initiatives;
4. **Targets:** e.g., percentage reduction objectives, elimination timelines;
5. **Metrics:** e.g., quantities of PFAS used or emitted, concentration levels in products or waste, remediation measures;
6. **Risks and opportunities:** e.g., regulatory fines, liabilities, brand and reputation risks, market opportunities for PFAS-free products;
7. **Governance:**
 - a. Board oversight and management responsibilities;
 - b. Relevant skills, expertise, and incentives (e.g., inclusion of PFAS-related targets in executive remuneration).

4.2. PFAS disclosure and its depth

Our results indicate that, out of the 432 annual reports analyzed, 34 mention PFAS at least once, meaning that approximately 8% of the reports include PFAS-related disclosures. Translating these findings to the firm level, we find that the 34 reports originate from 14 unique companies. Consequently, approximately 19% of Dutch listed firms mentioned PFAS at least once in their annual reports during the period 2019–2024.³ An overview of the companies reporting PFAS disclosures, the corresponding number of annual reports containing such disclosures, and selected firm characteristics is presented in Table 2⁴.

industries, in particular sectors such as industrial services and manufacturing (engineering, construction, infrastructure consulting), semiconductor manufacturing, and chemicals and materials manufacturing. Firms in the industrial services and manufacturing sectors together constitute 50% of all PFAS-related disclosures, highlighting the prominence of these industries in PFAS reporting. Companies operating in the electronic components and manufacturing sector account for a further 21% of disclosures. Firms such as Arcadis, BAM Group, Heijmans, ASM, and ASML operate in sectors where PFAS exposure may arise through construction materials, environmental remediation, and high-tech manufacturing processes.

Table 2. PFAS Disclosures by company and report count.

Name of the company	Number of reports with PFAS disclosure	Industry classification	Stock exchange	Number of employees (Headcount as of year-end 2024)
Arcadis	6	Industrial Services: Infrastructure Consulting and Design Services	AMX	33,433
BAM Group	5	Industrial Services: Infrastructure Construction	AScX	13,771
ASM	4	Electronic Components and Manufacturing: Semiconductor Front End Processing Equipment	AEX	4,600
ASR	4	Insurance: Life and Health Insurance	AEX	7,998
ASML	3	Electronic Components and Manufacturing: Semiconductor Front End Processing Equipment	AEX	43,395
Heijmans	3	Industrial Services: Diverse Construction and Engineering Services	AScX	5,844
ForFarmers	2	Food and Tobacco Production: Other Agricultural Support Activity Providers	AScX	2,550
Ahold Delhaize	1	Food and Staples Retail: Supermarkets	AEX	387,000
Akzo Nobel	1	Chemical, Plastic and Rubber Materials: Coatings Manufacturing	AEX	35,327
Avantium	1	Industrial Manufacturing: General Factory Automation Product Manufacturing	AScX	284
IMCD	1	Industrial Services: Chemical and Allied Products Distributors	AEX	5,126
TKH Group	1	Industrial Manufacturing: General Machinery Manufacturing	AMX	6,665
WDP	1	Real Estate: Equity REITs	AMX	122
ArcelorMittal	1	Mining and Mineral Products: Integrated Steel Mills and Products Manufacturing	AEX	125,416

Table 2 documents a relatively uneven disclosure pattern, with a small number of firms accounting for a large share of PFAS-related disclosures. Arcadis (6) and BAM Group (5) emerge as the front-runners, together accounting for over 30% of all PFAS-related reports, ASM (4) and ASR (4) contribute a further 24%, while Heijmans (3) and ASML (3) together account for an additional 18%. This concentration indicates sustained and repeated disclosure practices among only a limited group of firms.

Unsurprisingly, we find that PFAS disclosures are concentrated in industrial and infrastructure-related

With regard to firm size, measured by the number of employees, substantial heterogeneity is observed among PFAS-reporting firms. Headcount ranges from as few as 122 employees at WDP to as many as 387,000 at Ahold Delhaize. It seems that there is no one-to-one relationship between firm size and disclosure frequency, as might initially be expected. The fact that Avantium (284 employees) and WDP (122 employees) are among the PFAS disclosers – while they are ‘Wave 2’ companies, currently not included under NFRD or CSRD – adds to this observation. While very large firms such as Ahold Delhaize and

ArcelorMittal report PFAS disclosures only once, smaller or mid-sized firms such as Arcadis and BAM Group disclose PFAS information repeatedly. This suggests that operational exposure and business activities, rather than headcount alone, drive PFAS reporting intensity. Overall, the table indicates that PFAS disclosure is most prevalent among firms with direct involvement in infrastructure, industrial services, and advanced manufacturing, and that repeated disclosures are concentrated among companies with sustained environmental or regulatory exposure. Listing on a major stock exchange and firm size appear to influence disclosure, but industry characteristics seem to be the dominant factor.

Assessing the depth of PFAS disclosure, our findings show that the 34 reports with at least one PFAS reference result collectively in a total of 137 PFAS mentions. A detailed review of the disclosures reveals that 20 PFAS references (15% of the total references) are included solely in the glossary and definitions section, with no mention in the main body of the annual report. Consequently, these references are excluded from subsequent analyses.

Among the remaining 117 PFAS references, the extent of disclosure per report varies considerably, spanning from only one reference to as many as 19 within a single annual report. On average, each annual report contains 3.4 PFAS references. Table 3 provides an overview of the depth of PFAS disclosures, including the number of PFAS references per annual report, and the respective companies and years.

In our assessment, Heijmans and Arcadis stand out as the front-runners with the most extensive PFAS disclosures. Collectively, these two companies account for 62% of the total PFAS references. The annual reports of Heijmans collectively contain 35 PFAS references, while Arcadis' reports contain 37. The 2019 annual reports alone account for 19 and 14 PFAS references for Heijmans and Arcadis, respectively. The BAM Group's reports account for 11% of the total PFAS references, with the 2019 and 2020 reports containing 6 and 5 references, respectively.

4.3. Qualitative characteristics of PFAS disclosure

After analyzing the depth of the disclosures, we examine their qualitative characteristics based on the NFRD and CSRD guidelines. The first analytical dimension concerns the materiality assessment, capturing whether PFAS is identified as a material topic by the board of directors. Interestingly, despite the growing regulatory, litigation, and reputational landscape, only one report (0.002% of total reports) in our sample explicitly identified PFAS as a material topic. In its discussion of the materiality assessment and the resulting material themes, BAM Group's 2020 annual report identifies nitrogen and PFAS issues in the Netherlands as material topics, noting that global events – including PFAS, Brexit, and COVID-19 – had a relatively high impact on the company's performance and its stakeholders in 2020. Notably, this materiality label for PFAS disappeared in subsequent years.

Table 3. PFAS disclosures' depth by company and year.

Company name	N_PFAS	Year
Heijmans	19	2019
Arcadis	14	2019
Heijmans	9	2020
Arcadis	8	2024
Heijmans	7	2021
Arcadis	6	2020
Bam Group	6	2019
Bam Group	5	2020
Akzo Nobel	4	2024
IMCD	4	2022
Arcadis	4	2022
Arcadis	4	2023
TKH Group	4	2019
ASML	2	2023
ASML	2	2024
ASR Nederland	2	2022
Bam Group	2	2021
Ahold Delhaize	1	2023
ArcelorMittal	1	2022
ASM	1	2021
ASM	1	2024
ASML	1	2022
ASR	1	2020
ASR	1	2021
ASR	1	2023
Arcadis	1	2021
WDP	1	2020
Avantium	1	2019
Bam Group	1	2022
Bam Group	1	2023
ForFarmers	1	2019
ForFarmers	1	2020

Next, we examine whether PFAS disclosures reflect policy commitments, such as phase-out strategies, substitution efforts, or compliance with REACH and EPA requirements. Table 4 presents the companies that disclose PFAS-related commitments in their annual reports, along with the corresponding number of reports, stock exchange listings, and reporting years.

Table 4. Disclosures of PFAS-related commitments and policies.

Name of the company	Number of annual reports with PFAS-related policies	Stock exchange	Year
Ahold Delhaize	1	AEX	2023
ASM	1	AEX	2021
IMCD	1	AEX	2022
ArcelorMittal	1	AEX	2022

Our results indicate that 4 out of the 14 companies disclose PFAS-related information and also articulate concrete PFAS-related commitments and policies. This suggests that approximately 29% of the firms in our sample go beyond symbolic references to PFAS and appear to integrate PFAS considerations into their operations. Remarkably however, disclosure takes place in only one year, with no continuation in subsequent years, raising

questions on the consistency of the information. While small- and mid-cap firms are relatively well represented among companies disclosing PFAS-related information (see Table 2), PFAS-related commitments and policies are disclosed exclusively by AEX-listed firms. This finding further underscores the complexity and the heightened scrutiny to which these larger firms are subject. An example of a PFAS-related policy and commitment disclosure is present in Box 2.

Following this, we assess the next dimension under the NFRD and CSRD guidelines: PFAS-related actions

disclosed by the firms, including activities such as supplier engagement, testing procedures, and R&D initiatives. Our results (Table 5) show that 8 of the 14 PFAS-reporting companies (57%), via 12 out of 48 reports (25%) mention PFAS actions to address PFAS-related issues. Again, disclosure seems inconsistent since all companies – except Arcadis – report during one year only. It is also noteworthy that while AEX-listed firms continue to dominate (63%) PFAS-related actions, the other two stock exchanges account for 37%. An example of a PFAS-related actions disclosure is presented in Box 3.

Box 2. PFAS-related commitment in IMCD's 2022 annual report.

Giving prized sneakers a future with a sustainable protector

“In partnership with a leading sneaker brand and our key principals, IMCD Home Care and I&I has been developing an effective treatment to protect sneakers from staining and water damage. While it has been possible in the past to create a product that would repel liquid and stains, these often-contained PFAS (per- and polyfluoroalkyl substances) and highly flammable VOCs (volatile organic compounds). On 13 January 2023, the national authorities of Denmark, Germany, the Netherlands, Norway, and Sweden submitted a proposal to ECHA to restrict PFASs under REACH, the European Union's chemicals regulation. This will lead to the quick removal of PFAS ingredients from formulations already on the market.”

“Our technical experts have worked closely in partnership with this leading brand to test the effectiveness of the solution against stains as diverse as wine, coffee, and tea. We were able to develop a solution that was effective at repelling all the test stains without marking the sneaker and maintaining the original appearance of the plastic parts. The final formulation will also comply with the anticipated update to REACH regulations regarding removal of PFAS.”

Box 3. PFAS-related actions in Arcadis' annual reports.

PFAS: innovation in remediation

“Arcadis is at the forefront of a global effort to remove PFAS from impacted sites and environments, with over 400 projects in 12 countries. Our pipeline of PFAS projects at the end of 2019 amounted to € 500+ million in gross revenues. Two examples of Arcadis thought leadership in regard to PFAS restoration technology are presented below.

In 2019, Arcadis expanded its PFAS capabilities as it signed an agreement with EVOCRA, to license the sole rights to the EVOCRA technology for PFAS solutions. EVOCRA, an Australian-based water treatment company, have a patented technology that uses ozone fractionation to separate and concentrate PFAS from impacted media. Their process has been demonstrated at commercial scale as having the ability to remove PFAS and deliver an output that meets the most stringent discharge requirements set by regulators and other relevant authorities. In early 2020, an exclusive teaming agreement with ABS Materials, Inc. (ABS) in the US was signed, focused on the removal of PFAS from water. ABS technology centers on patented molecularly engineered porous and mechanically flexible organosilica-based sorbents. PQ-Osorb® is the brand name for an ABS product designed to treat PFAS of all chain lengths – both long-chain PFAS such as PFOA and harder-to-treat short-chain compounds such as perfluorobutanoic acid (PFBA). The sorption kinetics (speed at which PFAS is removed) and loading capacity (pounds of PFAS per pound of media) are proving to be far better for PQ-Osorb® than similar technologies, and its effectiveness is not reduced by other contaminant's; in the water.” (Arcadis Annual report 2019, p. 12)

North America: Developments in 2019

“Arcadis has partnered with the US Air Force in a technology demonstration for the advancement of PFAS technologies. Based on the success of this demonstration, Arcadis was awarded a pilot project for PFAS surface water/sediment remediation project at Ellsworth AFB in South Dakota to advance the technology application and demonstrate its effectiveness including flocculation, mechanical suspension of sediments, extraction, filtration and subsequent stabilization of pond sediments.” (Arcadis Annual report 2019, p. 112)

North America: Market dynamics

Table 5. Disclosures of PFAS-related actions.

Name of the company	Number of annual reports with PFAS-related actions	Stock exchange	Year (s)
Akzo Nobel	1	AEX	2024
Arcadis	5	AMX	2019; 2020; 2022; 2023, 2024
ASM	1	AEX	2024
ASR	1	AEX	2022
BAM	1	AScX	2020
Heijmans	1	AScX	2019
IMCD	1	AEX	2022
ArcelorMittal	1	AEX	2022
Total	12		

The next two dimensions we analyze concern PFAS-related targets and metrics. Targets include, for example, percentage reduction objectives and elimination timelines, while metrics cover quantities of PFAS used or emitted, concentration levels in products or waste, and remediation measures. Our results indicate that none of the firms in our sample report concrete PFAS-related metrics. However, in the targets category, we find that one company – Heijmans – incorporates PFAS into its target and goal setting in the 2020 and 2021 annual reports, after which years the information again disappeared from its reports. This is illustrated in Box 4.

Not surprisingly, our findings show that the most PFAS-oriented disclosures pertain to the dimension of risks and opportunities, encompassing regulatory fines, liabilities, brand and reputation risks, as well as market opportunities for PFAS-free products. Our results show that 11 of the 14 PFAS-reporting companies mention such risks or opportunities in their annual reports, indicating that approximately 79% of the sample views PFAS and related regulations or trends as either a risk or an opportunity for their business models and operations. Furthermore, several firms report these risks and opportunities across multiple annual reports, resulting in a total of 28 reports. This means that, of the 34 reports containing PFAS disclosures, 82% addresses risks and opportunities. Table 6 presents the companies that present PFAS disclosures as either risks or opportunities in their annual reports, along with the corresponding number of reports, stock exchange listings, and reporting years.

Box 4. PFAS-related targets in Heijmans' annual report.

10.3.1 Energy: Our production is CO₂ neutral and we create energy-neutral solutions

Concrete goals:

13. From 2023, Heijmans is CO₂ neutral. Any residual value is offset.
14. In 2023, we can produce emissions free, and in 2030 we do so on all our projects.
15. In 2023, we can deliver 100% energy-neutral solutions for our clients.

Table 6. Disclosures of PFAS-related risks and opportunities.

Name of the company	Number of annual reports with PFAS-related risks and opportunities	Stock exchange	Year (s)
Arcadis	6	AMX	2019; 2020; 2021; 2022; 2023, 2024
BAM	5	AScX	2019; 2020; 2021; 2022; 2023
ASR	4	AEX	2020; 2021; 2022; 2023
ASML	3	AEX	2022; 2023; 2024
Heijmans	3	AScX	2019; 2020; 2021
ForFarmers	2	AScX	2019; 2020
Akzo Nobel	1	AEX	2024
Avantium	1	AScX	2019
IMCD	1	AEX	2022
TKH Group	1	AMX	2022
WDP	1	AMX	2020
Total	28		

The results in Table 6 show that the top-3 companies together account for more than 50% of the total risk- and opportunities-related PFAS disclosures. This is consistent with the findings in Table 2, which show that firms operating in industries such as engineering, construction, and infrastructure – where PFAS contamination, remediation, and regulatory compliance are directly relevant to core business activities – are more likely to be affected by emerging PFAS trends and regulatory changes. This makes firms such as Arcadis, BAM, and Heijmans more likely to report PFAS-related risks and opportunities in a more systematic manner, as evidenced by their number of reports in which such disclosures appear. However, only Arcadis discloses the information consistently in all years investigated. Moreover, while AEX-listed firms are visible in this dimension, the prominence of AMX- and AScX-listed firms in this category reinforces the fact that exposure to PFAS-related operational risks, rather than firm size alone, drives the discussion of PFAS-related risks and opportunities. An example of a PFAS-related risk disclosure is presented in Box 5 and an example of a PFAS-related opportunity in Box 6.

The final dimension of our analysis focuses on governance. This category encompasses disclosures related

Box 5. Discussion of PFAS-related risks in BAM's annual report.**Strategy execution**

“Several external influences impacted the construction industry in 2019. Firstly, economies across BAM's home markets showed a flattening of growth. Trade wars, uncertainty about the outcome of the Brexit process, declining consumer and industry confidence, made them hesitant. In the Netherlands, environmental rulings such as the PFAS- and PAS (nitrogen)-case, led to further uncertainty within the industry. Secondly, (governmental) sustainability agendas and mega trends, such as urbanisation and energy efficiency, are creating new areas for increased growth. Thirdly, digitalisation continued to have a transformative effect on the construction industry and the built environment. Against this background, the main focus of BAM's strategy in 2019 remained to improve profitability and capital efficiency.” (BAM Annual report 2019, p. 16)

PAS and PFAS**Box 6.** Discussion of PFAS-related opportunities in Arcadis' annual report.**Trends and highlights from 2024**

“We've see an uptick of interest — and sizable wins- in addressing PFAS contamination. There is growing concern about the dangers of these compounds, widely used in manufacturing for many decades, which is driving clients to look at PFAS in their buildings' fire suppression systems, or their water systems. This is a fast growing market for Arcadis.” (Arcadis Annual report 2024, p. 9)

Summary highlights of our performance in 2024

to board oversight and management responsibilities concerning PFAS, as well as information on relevant skills, expertise, and incentive structures. Examples include the integration of PFAS-related targets into remuneration plans and other governance mechanisms designed to support effective management of PFAS-related risks and impacts. Our results indicate that only one company in our sample – Heijmans – reported governance-related PFAS disclosures, as reflected in its 2019 and 2020 annual reports. This finding may be partially explained by the results in the targets category, where Heijmans was the only company to incorporate PFAS into its target and goal-setting activities (see Box 4). An example of a governance-related PFAS disclosure is presented in Box 7.

As a final step in our analysis, we examine whether the PFAS disclosure appears in an audited section of the annual report and, if so, what type of assurance was applied (limited or reasonable). We find that a substantial proportion of the reports disclosing PFAS-related information are audited by an external auditor. Specifically, approximately 56% of PFAS-related disclosures appear in sections of the annual reports that are subject to external audit (19 out of total 34 reports, 8 companies). With respect to the level of assurance provided, our findings reveal that 21% of the audited PFAS disclosures receive actually a reasonable level of assurance. The PFAS disclosures in the annual reports of the BAM Group for the years 2020 and 2021, as well as those of ForFarmers for

Box 7. Governance-related PFAS disclosure.**Implementation of the remuneration policy Executive Board in 2019**

2019 and 2020, were audited at a reasonable level of assurance. As expected, most PFAS disclosures (79%) were subject to a limited level of assurance.

5. Additional analysis

To gain deeper insights into PFAS reporting and disclosure behavior, we examine reporting patterns of firms operating in industries where PFAS is considered material compared to industries where the potential materiality of PFAS is relatively low. To classify industries according to PFAS materiality, we follow the industry classification proposed by Glüge et al. (2020). An overview of firms operating in high PFAS materiality industries and their PFAS reporting behavior is presented in Appendix 4.

Our descriptive results show that, out of a total of 75 companies, 31 operate in industries where PFAS is considered material to companies' operations and supply chains. Among these 31 firms, 7 report and disclose PFAS-related information, which implies that slightly less than 25% actually report on PFAS. Looking at the total number of PFAS-disclosing reports (34), 19 originate from firms operating in industries with high PFAS materiality, representing 56% of all disclosures. This suggests that PFAS reporting is somewhat more prevalent among firms in industries where PFAS issues are considered highly material. Out of 44 firms operating in industries with low PFAS materiality, 7 report and disclose PFAS-related information. This corresponds to 16% of firms providing PFAS disclosures, even though such reporting might not necessarily be expected given the low materiality of PFAS in their industries. In these cases, disclosures primarily emphasize opportunities and competitive advantages related to PFAS-related innovation or implementation, suggesting largely voluntary reporting consistent with prior literature (e.g., Hahn and Kühnen 2013).

Among firms in high-materiality industries, disclosure practices vary widely. Reporting firms range from smaller companies such as Avantium to large multinationals such as ASML. Reporting frequency also differs, with some firms disclosing PFAS only once (e.g., AkzoNobel), while others report repeatedly, such as Royal BAM Group between 2019 and 2023. Disclosure maturity also varies: some firms provide basic statements identifying PFAS-related risks or opportunities (e.g., ASML, Avantium), others frame PFAS as a material sustainability issue and link it to actions (e.g., BAM), while more advanced disclosures integrate PFAS into governance structures, including board incentives (AkzoNobel). A small number provide more comprehensive disclosures covering risks, targets, governance, and actions (e.g., Heijmans). These differences suggest that firms are at varying stages in the development and sophistication of PFAS-related disclosure practices.

Despite operating in industries where PFAS is regarded as material, many companies still do not disclose PFAS-related information. One possible explanation relates to differences in firm size, as smaller firms may lack the financial resources, technical expertise, and internal capacities

required to identify, monitor, and report on PFAS across complex operations and supply chains. In addition, companies may interpret the concept of materiality differently and may therefore conclude that PFAS is not sufficiently material to warrant disclosure in their reports. Lastly, even within industries classified as having high PFAS exposure, the level and type of exposure can vary significantly. Semiconductor companies, such as ASML and ASM International, primarily work with specialty chemicals, resulting in higher direct contact with PFAS. In contrast, construction firms like BAM Group and Heijmans are exposed mainly through soil contamination on project sites. Consumer brands, including Unilever and Heineken, generally have limited direct involvement with PFAS in their production processes. As a result, companies that directly produce or process PFAS are more likely to provide disclosures and actively manage the issue. Downstream or indirect users, by contrast, often consider PFAS exposure less central to their operations, which can influence both their reporting and their approach to risk management.

6. Discussion and conclusion

This exploratory study provides the first descriptive evidence on PFAS reporting by Dutch listed companies, revealing a striking disconnect between the recognized environmental and health risks of PFAS and their treatment in corporate reporting. Although PFAS are increasingly regulated and publicly debated, disclosures remain rare, fragmented, inconsistent and largely qualitative, with most firms limiting discussion to risk narratives rather than embedding PFAS in assessments, targets, metrics, or governance. These findings align with prior sustainability reporting research showing that mandatory disclosure regimes increase the quantity but not necessarily the quality of reporting. The absence of explicit PFAS references in the ESRS appears to contribute to the observed non-disclosure, yet existing requirements on hazardous substances and pollution already provide a legal basis for disclosure when PFAS are material. It should also be noted that variations in PFAS (non-)disclosure may stem from differences in companies' financial resources, technical expertise, and internal capacities required to identify, monitor, and report on PFAS across complex operations and supply chains. In addition, interpretations and assessments of materiality might differ across firms, and even within industries classified as having high PFAS exposure, the level and type of exposure can vary significantly. However, given the growing regulatory, litigation, and reputational landscape, it appears unlikely that PFAS would truly be immaterial for virtually all sample companies.

The findings of this study have direct implications for corporate managers and sustainability professionals. Despite growing regulatory scrutiny and societal concern, PFAS remain largely invisible in corporate reporting, even among firms operating in sectors with clear exposure to PFAS-related risks. This lack of transparency may hamper

effective risk management, undermines stakeholder trust, and may leave companies unprepared for stricter enforcement under existing sustainability legislation. For practitioners, the results underscore the need to proactively integrate PFAS into materiality assessments, internal risk management systems, and sustainability governance structures, even in the absence of explicit ESRS requirements. Companies that develop clear policies, measurable targets, and reliable metrics on PFAS use, emissions, and substitution can not only improve compliance readiness under the CSRD but also strengthen strategic decision-making and credibility with investors, customers, and regulators.

Recommendations for regulators

For regulators, we propose three complementary avenues on how PFAS-related disclosure guidance could be improved within the existing principle-based architecture of the ESRS framework.

- 1) Regulators and standard setters could provide interpretative guidance clarifying how PFAS-related risks and impacts should be considered within existing ESRS standards, particularly ESRS E2 (Pollution), including examples of relevant policies, actions, targets, and metrics.
- 2) Sector-specific guidance could be developed for industries with higher PFAS exposure (e.g., chemicals, semiconductors, infrastructure, and construction), where operational exposure and regulatory risk are more likely to be material.
- 3) Illustrative implementation examples or best-practice disclosures could help companies operationalize PFAS reporting while maintaining the flexibility inherent in principle-based standards.

Our recommendations should, however, be interpreted with caution given the limited insights and evidence provided by our sample to avoid overstating any conclusions.

■ **Dr. O. Ihl-Deviv'e** – Olga is assistant professor in financial accounting at Open Universiteit.

■ **Dr. T. Thijssens** – Thomas is associate professor in accounting & sustainability at Open Universiteit.

Notes

1. Under the EU REACH Regulation (see under 3.3) several specific PFAS groups have been added to the REACH SVHC Candidate List from 2019. In addition, Dutch authorities have included all PFAS on the national SVHC list as of late 2024.
2. As this paper focuses specifically on PFAS, our keyword search included the terms *PFAS* and *per- and polyfluoroalkyl substances*.
3. The yearly distribution of the reports is presented in Appendix 3.
4. Industry classification and employee headcount figures are taken from FactSet.
5. (EC) No 1907/2006.
6. (EC) No 1272/2008.
7. (EC) No 166/2006.
8. Including: Ambient Air Quality Directive (2008/50/EC), Water Framework Directive (2000/60/EC), Groundwater Directive (2006/118/EC), Industrial Emissions Directive (IED) (2010/75/EU), Chemical Agents Directive (98/24/EC), Carcinogens, Mutagens and Reprotoxic Substances Directive (CMRD – 2004/37/EC).

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Appendix 1

Other PFAS-related legislation

At EU-level, Regulation (EU) 2019/1021 applies, which regulates the elimination or strict control of the production, use, and release of persistent organic pollutants (POPs), including PFAS. This regulation has led to bans or severe restrictions on PFHxA, PFOS, and PFOA in specific applications (European Commission 2024; Rijksoverheid.nl n.d.). In addition, the Netherlands, together with Germany, Denmark, Norway, and Sweden, in 2023 submitted a proposal for a European-wide restriction on all PFAS (ECHA 2023). Further, EU-companies are targeted directly by EU chemicals law, and EU pollution law. As for the chemicals law, two regulations apply: REACH, and the Classification, labelling, and packaging (CLP) Regulation. Under the REACH Regulation⁵, manufacturers and importers of registered substances are required to indicate the persistence, bioaccumulation and toxicity of a substance (Rijksoverheid.nl n.d.; Van Herwijnen et al. 2024). For example, REACH Article 33 states that companies supplying products containing Substances of Very High Concern (SVHCs) above a certain threshold, have a legal duty to communicate this to downstream users and consumers (<https://reachonline.eu/reach/en/title-iv-article-33.html>). CLP⁶ governs the classification, labelling and packaging of chemical substances, ensuring that chemical hazards are clearly communicated to protect human health and the

environment. The EU pollution law sets strict rules to prevent and reduce pollution via E-PRTR (Pollutant Release Transfer Register) Regulation⁷. E-PRTR requires reporting of PFAS emissions and off-site transfers by large industrial installations (Brans et al. 2024).

Next to the aforementioned regulations, the European Commission has issued several directives in the context of protecting human health and the environment, which are relevant to companies that are active with PFAS-containing products⁸. These directives affect companies indirectly through national implementation, permits, or planning decisions.

In the Netherlands, these directives are implemented and enforced through the Environment and Planning Act (*Omgevingswet*) and Working Conditions Act (*Arbeidsomstandighedenwet*). In the context of the environment, the Environmental Activities Decree (*Besluit activiteiten leefomgeving* (Bal)) sets operational requirements on permits, reporting, emission prevention and reduction programs for PFAS as substances of very high concern (SVHC). Additionally, the Environmental Quality Decree and Soil Quality Decree set quality standards for, and limit PFAS discharges to water, air and soil. Finally, the Working Conditions Act and Working Conditions Decree regulate exposure of workers to PFAS.

Appendix 2

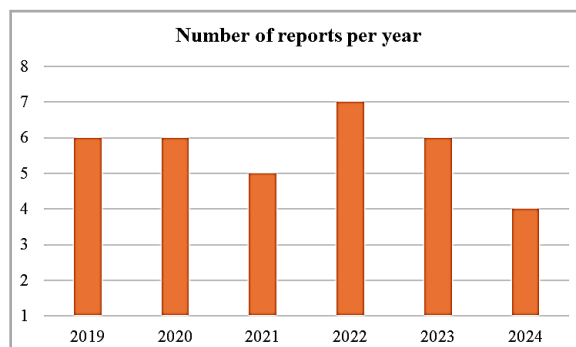
Table A1. Detailed overview of sample firms.

Name	Index	Sector (GICS)	Country
ABN AMRO	AEX	Financials	Netherlands
Adyen	AEX	Financials	Netherlands
Aegon	AEX	Financials	Netherlands
Ahold Delhaize	AEX	Consumer Staples	Netherlands
Akzo Nobel	AEX	Materials	Netherlands
ArcelorMittal	AEX	Materials	Luxembourg
ASM International	AEX	Information Technology	Netherlands
ASML	AEX	Information Technology	Netherlands

Name	Index	Sector (GICS)	Country
ASR Nederland	AEX	Financials	Netherlands
BE Semiconductor (Besi)	AEX	Information Technology	Netherlands
DSM	AEX	Materials	Netherlands
Exor	AEX	Financials	Netherlands
Heineken	AEX	Consumer Staples	Netherlands
IMCD	AEX	Materials	Netherlands
ING Group	AEX	Financials	Netherlands
KPN	AEX	Communication Services	Netherlands
NN Group	AEX	Financials	Netherlands
Philips	AEX	Health Care	Netherlands
Prosus	AEX	Consumer Discretionary	Netherlands
Randstad	AEX	Industrials	Netherlands
RELX	AEX	Industrials	United Kingdom
Shell	AEX	Energy	United Kingdom
Universal Music Group (UMG)	AEX	Communication Services	Netherlands
Unilever	AEX	Consumer Staples	United Kingdom
Wolters Kluwer	AEX	Industrials	Netherlands
Aalberts	AMX	Industrials	Netherlands
Air France - KLM	AMX	Industrials	France
Alfen	AMX	Industrials	Netherlands
Allfunds Group	AMX	Financials	United Kingdom
AMG	AMX	Materials	Netherlands
Aperam	AMX	Materials	Luxembourg
Arcadis	AMX	Industrials	Netherlands
Basic-Fit	AMX	Consumer Discretionary	Netherlands
Corbion	AMX	Materials	Netherlands
CTP	AMX	Real Estate	Netherlands
Eurocommercial	AMX	Real Estate	Netherlands
Fagron	AMX	Health Care	Belgium
Flow Traders	AMX	Financials	Netherlands
Fugro	AMX	Energy	Netherlands
Galapagos	AMX	Health Care	Belgium
Inpost	AMX	Industrials	Luxembourg
JDE Peet's	AMX	Consumer Staples	Netherlands
Just Eat Takeaway	AMX	Consumer Discretionary	Netherlands
OCI	AMX	Materials	Netherlands
SBM Offshore	AMX	Energy	Netherlands
Signify	AMX	Industrials	Netherlands
TKH Group	AMX	Information Technology	Netherlands
Van Lanschot Kempen	AMX	Financials	Netherlands
Vopak	AMX	Energy	Netherlands
WDP	AMX	Real Estate	Belgium
Accsys Technologies	AScX	Materials	United Kingdom
Acomo	AScX	Consumer Staples	Netherlands
Avantium	AScX	Materials	Netherlands
Azerion	AScX	Communication Services	Netherlands
B&S Group	AScX	Consumer Staples	Netherlands
BAM Group	AScX	Industrials	Netherlands
Brunel International	AScX	Industrials	Netherlands
CM.com	AScX	Information Technology	Netherlands
Ebusco Holding	AScX	Industrials	Netherlands
Fastned	AScX	Industrials	Netherlands
ForFarmers	AScX	Consumer Staples	Netherlands
Heijmans	AScX	Industrials	Netherlands
Kendrion	AScX	Industrials	Netherlands
Majorel Group Luxembourg	AScX	Industrials	Luxembourg
Nedap	AScX	Information Technology	Netherlands
NSI	AScX	Real Estate	Netherlands
Ordina	AScX	Information Technology	Netherlands
Pharming Group	AScX	Health Care	Netherlands
PostNL	AScX	Industrials	Netherlands
SIF Holding	AScX	Energy	Netherlands
Sligro Food Group	AScX	Consumer Staples	Netherlands
TomTom	AScX	Information Technology	Netherlands
Vastned Retail	AScX	Real Estate	Netherlands
Vivoryon Therapeutics	AScX	Health Care	Germany
Wereldhave	AScX	Real Estate	Netherlands

Appendix 3

Figure A1. Yearly distribution of PFAS-disclosing reports.



Appendix 4

Table A2. Overview of firms in high PFAS materiality industries and their PFAS reporting.

Name of the firm	PFAS reporting: Yes / No	Reporting frequency	Number of employees	Nature of PFAS disclosure
Akzo Nobel	Yes	1 report in 2024	35,327	Risk and opportunities, as well as governance (Skills, expertise, and incentives (inclusion of PFAS targets in the remuneration of board) related to managing it)
Aalberts	No		13,124	
Accsys Technologies	No		236	
Alfen	No		1,053	
AMG	No		3,651	
ASM International	Yes	4 reports: 2021, 2022, 2023 and 2024	4,600	Policies and actions
ASML	Yes	3 reports: 2022, 2023 and 2024	43,395	Risk and opportunities
Avantium	Yes	1 report in 2019	284	Risk and opportunities
Bam Group	Yes	5 reports: 2019,2020,2021, 2022 and 2023	13,771	PFAS is identified as material topic Risk and opportunities Actions
BE Semiconductor	No		1,812	
Corbion	No		2,399	
DSM	No		28,214	
Exor	No		23	
Fagron	No		3,935	
ForFarmers	Yes	2 reports: 2019 and 2020	2,500	Risk and opportunities
Fugro	No		10,666	
Galapagos	No		704	
Heijmans	Yes	3 reports: 2019, 2020 and 2021	5,844	Risk and opportunities Targets Actions Governance
Heineken	No		88,497	
JDE Peet's	No		20,389	
Kendrion	No		1,609	
Nedap	No		1,041	
OCI	No		776	
Pharming Group	No		426	
SBM Offshore	No		6,417	
Shell	No		96,000	
SIF Holding	No		677	
Signify	No		29,459	
Unilever	No		120,040	
Universal Music Group (UMG)	No		9,700	
Vivoryon Therapeutics	No		14	