Environmental, Social, and Governance (ESG) Evaluation

TenneT Holding B.V.

Executive Summary
TenneT Holding B.V. is a European electricity transmission system operator (TSO) serving 41 million end users in the Netherlands and Germany through about 22,900 kilometers (km) of high-voltage transmission lines. The Autoriteit Consument & Markt in the Netherlands and the Bundesnetzagentur (BNetzA) in Germany regulate the company’s activities. TenneT generates annual turnover of about €4.0 billion and EBITDA of €1.5 billion, with limited nonregulated activities. Its asset book value totals €22 billion. Because of the energy transition in the Netherlands and Germany, TenneT is going through a significant regulated capital expenditure (capex) plan to connect renewable generation capacities to the high and ultra-high voltage grid and extend long-distance transport capabilities. As a result, ESG topics are embedded in the strategy and throughout the company.

The company's ESG evaluation score of 83 reflects the transmission sector's relatively low environmental exposure and the Netherlands' and Germany's high governance standards. The profile benefits from TenneT’s proactive relationship with communities, strong safety management, and strong governance structure, reinforced by our view of its strong preparedness. The company focuses on providing long-term, strategically resilient critical infrastructure, with a focus on affordability while maintaining a healthy financial profile and making sustainable choices. It has chronic exposure to pushback from communities that do not want transmission construction in their locality. We see communities as the principal source of risk exposure in TenneT's social profile.

Profile Score
78/100

Preparedness Opinion
Strong

Awareness: Excellent
Assessment: Excellent
Action: Excellent
Culture: Good
Decision-making: Good

ESG Evaluation
83/100

Entity
TenneT Holding B.V.

Location (HQ)
Netherlands

Primary Operation Location(s)
Netherlands and Germany

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Primary Contact
Bjorn Schurich
+49 (0) 69 33 999 237
bjorn.schurich@spglobal.com

Secondary Contact
Beatrice de Taisne
+44 (0) 20 7176 3938
beatrice.de.taisne@spglobal.com

Beth Burks
+44 (0) 20 7176 9829
beth.burks@spglobal.com

Entity-specific attainable and actual scores

S&P Global Ratings | Environmental, Social, and Governance (ESG) Evaluation

This product is not a credit rating

Aug. 27, 2019

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## Component Scores

### Environmental Performance

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**E Profile (30%)** 80

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<td>Safety Management</td>
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<td>Customer Engagement</td>
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<tr>
<td>Communities</td>
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**S Profile (30%)** 66

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<td>Code and Values</td>
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<td>Transparency and Reporting</td>
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**G Profile (40%)** 86

### ESG Profile (incl. any adjustments)

**78/100**

## Preparedness Summary

We view TenneT’s preparedness as strong. The company is a core enabler of the energy transition to a less-carbon-intensive generation mix for the Netherlands and Germany. As a result, the energy transition shapes discussions the company has with regulators in both countries and fuels a long-term vision of what the company wants to achieve. We believe TenneT’s strategy is resilient.

## Preparedness Opinion

**Score**

**83/100**

### ESG Evaluation

- **ESG Profile**: 78/100
- **Preparedness Opinion**: Strong (+5)
- **Further Adjustment (if any)**: None
ESG Profile

Overview

TenneT's environmental profile score of 80 reflects the company's low exposure to environmental risks as a TSO, despite the utility sector's generally high exposure. Its greenhouse gas (GHG) emissions are low compared with those of other TSOs. We expect the company's GHG emissions to decline as it moves towards renewable integration. Water is immaterial to the company's direct operations, but could affect the security of the energy supply if droughts affect power generators. Water risks are currently well-managed. TenneT's construction activities, particularly from offshore wind farms, create land use and biodiversity risks, but the company works closely with governments and stakeholders to minimize these risks. TenneT has recently begun to track waste metrics, although it is already an established practice among peers.

The company's social profile score of 66 reflects inherent risks in its activities, because any disruption to these services would trigger potential negative political pressures or put at risk its license to operate. TenneT mitigates this with its strong performance in safety management, proactive engagement with communities and high grid availability. The workforce is mainly male-dominated and the turnover is low, which is typical of the sector. Safety management is strong compared with that of global peers, and the company has detailed safety policies and established practices. As a regulated TSO, TenneT's main capex use is for renewable integration plans that come with the security of energy supply and increases affordability risks, which could affect customer engagement if grid availability is not careful managed. Furthermore, the company's new expansion plans might affect relations with local communities. TenneT scores high in its customer satisfaction metrics and participates in dialogues with stakeholders to agree on acceptable actions during its expansion plans.

TenneT's governance score of 86 reflects the regulated nature of its activities in markets with strong governance standards, with greater scrutiny than an unregulated company; and which forces it to justify how capex is decided, executed, and whether it's a cost-efficient use of resources. We view the regulatory framework as a strength.

We have adjusted the environmental and social profiles to incorporate the low materiality of water and high materiality of communities for TenneT.
Environmental Factor Analysis

**Greenhouse Gas Emissions**

- TenneT's GHG emission profile is stronger than that of other networks because of the regulatory support for the energy transition. TenneT bases its large capex on the need to facilitate renewable integration following the Paris Agreement. We expect scope 2 emissions (90% of total emissions) to decrease as TenneT minimizes grid losses and optimizes the power purchased to compensate for the remaining grid losses.

- An incident in Germany at the Siemens substation caused the percentage of SF6 leaked to increase (0.30% compared to 0.28% in 2017). However, TenneT has a track record of meeting its targets before a deadline. For example, the company achieved its target to reduce SF6 leakages by 20% (to 0.28%) from 2015 by 2017, three years ahead of schedule. If there is sufficient space, newly built substations use air insulation to prevent leakages, so we expect further reductions beyond 2020.

- With the increasing amount of offshore projects, scope 3 emissions will rise slightly. For example, helicopters are used for offshore assets where there is no alternative low-carbon technology. However, compared to its overall emissions profile, these are negligible.

**Waste**

- TenneT has only recently started tracking waste-related data, so it has not disclosed any yet. The company is identifying waste streams and setting a base year for the related data. It created a detailed policy on waste management and already identified new targets to reduce virgin copper use and nonrecyclable waste by 25% in 2025 compared to 2020. These waste streams stem from its construction activities, the largest source of waste.

- Construction waste is a priority waste stream in the EU because these materials can often be recycled or reused, and represents 25%-30% of waste by tonnage. Reporting on waste metrics, including generated waste, recycled waste, and hazardous and nonhazardous waste is a well-established practice among industry peers. TenneT could have further opportunities to improve its lifecycle management of materials by better monitoring its various waste streams.

**Water**

- Water usage is mainly limited to office buildings because TSOs do not require water cooling. TenneT does not track its own water use metrics, and this is in line with the industry.

- The company is indirectly exposed to water risks from the power generation sector, as thermal generators rely on water for cooling and hydropower generators rely on sufficient flow. Inadequate water resources could pose risks in the energy supply. This has been well-managed, and good communication with power generators is inherent to TenneT's system operator role.

- In addition, the company's operations depend on adequate water levels in rivers because most of its construction materials are transported via boats. This affected TenneT's business in 2018, when a summer drought made the water level in parts of the Rhine River too low for transport. These delays can affect capex execution, but this is fairly marginal given the capex program's scope.

**Land Use**

- One of the company's main development projects is "Energy Turnaround": building grid connections in offshore marine environments, with more planned until 2025. The company also participates in stakeholder discussions on biodiversity. On land, TenneT can build its cables underground to minimize the impact on habitats. However, local communities drive this decision, and it ultimately comes down to affordability.

- TenneT uses herbicides to control plant growth at its stations to combat the risk of fires. It will need to find alternatives if regulations continue on their current trajectory of restricting pesticide use, leaving the company with some unmitigated risks.

- The Netherlands and Germany have relatively fewer threatened species, although Germany's Environmental Ministry recently introduced the Insect Protection Action Plan to address the decline in insect populations. TenneT is managing this regulatory risk by cooperating with nongovernmental organizations' efforts and monitoring the impact of reintroducing wildflowers at its substations on local insect populations.

**General Factors +3**

- We have adjusted the environmental profile to reflect that water is less material for transmission networks than for other peer regulated utilities, such as water networks.
Social Factor Analysis

Workforce and Diversity

- TenneT has a good policy on workforce and diversity. The company's workforce is male-dominated and employee turnover is low. We consider low turnover a positive factor but it also indicates that employees are relatively stable over time and that the company is successful in retaining talent. A turnover rate of 15% or lower is considered a good indicator of a well-managed labor force.

- Women represent 22% of the company's total number of employees. This is in line with the current 22% average of the European utilities sector and similar to global peers. The company aims to increase the percentage of female employees to 22% in 2023 and the percentage of female executive and supervisory board members to 30% in 2023 (compared with 22% in 2018). Parental leave is in line with each country's legislation.

- The age demographic is also typical of the utilities sector, with the smallest proportion being under 30 (13%).

Safety Management

- Like many companies in the energy sector, safety is a key focus area for TenneT. Employees benefit from an internal safety award and a well-developed, rules-based risk management framework. The company also has relevant safety policies and training.

- The main risk for severe accidents comes from working at the high-voltage substations or construction sites. However, these accidents are unlikely to happen and the vast majority of TenneT's recorded incidents relate to slips, trips, and falls.

- The company's safety record is strong compared with that of global peers. Data from Eurostat puts the Netherlands and Germany among the safest countries to work in for the electricity, gas, steam, and air conditioning supply sector. Still, one TenneT subcontrator died in 2016 in Elist, Netherlands, the only fatality in the past five years. This led to safety reviews for contractors. The company recognizes that safety is an area for continuous improvement.

Customer Engagement

- TenneT's direct customers are each local distribution system operator (DSO) in its geographical area. TenneT engages with each DSO and provides solutions and support to them. TenneT's satisfaction metrics scores are high both in the Netherlands (87% in 2017) and Germany (94%), but it is facing increasing risk in its system operation activities related to integrating renewable assets into its networks. Offshore assets, for example, have a lower security of supply than traditional generation assets (92%-98% compared with 99.9986%-99.9999%) and affordability could become an issue given the cost of TenneT's high capex plan.

- The company links its networks with the North West European Market, where it cooperates with other European TSOs to solve supply issues and invests in innovation and digitalization, exploring alternative energy storage, small-scale assets for congestion management, and weather forecasting.

- In addition, TenneT has developed strong relationships and partnerships with its customers, the local DSOs. The company participates in customer events and meetings and produces public market reports.

Communities

- TenneT and its role in the Netherlands and Germany's energy policies have general support. However, the company has chronic exposure to pushback from communities that do not want new transmission construction in their locality. As a result, the company is following best practices in terms of proactively engaging stakeholders in discussions during the planning stages of building new physical assets. The number of public meetings and events TenneT participates in has increased dramatically from 188 in 2015 to 738 in 2018. Growth in TenneT's network has fueled this and will continue doing so in the near future.

- The company has a robust policy on human rights and joined the U.N. Global Compact in 2015. It extended this requirement to its suppliers, which they visit to check for concerns and policy breaches. Furthermore, this year, an external consultant reviewed the company's human rights policies and practices.

General Factors +3

- We have adjusted the social profile to reflect TenneT's strong mitigation of its most material source of risk for the business: the impact of construction activities related to the energy transition on local communities.
Governance Factor Analysis

Structure and Oversight

- Governing TenneT is a supervisory board, made up entirely of nonexecutive directors and is responsible for overseeing the executive boards in the Netherlands and Germany. Strong connections, structure, reporting, and communications between the dual boards provide good evidence that the boards are integrated on long-term planning, strategy development and investment approvals.

- Although TenneT is government-owned and the Dutch government can nominate board members, the selection process is in line with that of other corporates. The supervisory board has seven members, following the appointment of three new members in May 2019. Supervisory board members come from a diverse background of industry, finance, and audit, which we believe provides effective oversight.

- All key policies are in place. The company's governance has a stand-alone policy on whistleblowing. TenneT also has documentation that addresses topics such as money laundering, corruption, bribery, and fraud.

Code and Values

- We view TenneT's code and values as strong because environmental values to increase renewable energy, and a commitment to quality and integrity in its working culture, are integral to its value statement. The company also factors sustainability and stakeholder value into its mission statement.

- In addition, TenneT has a code of conduct on which all employees receive training. The company demonstrates its commitment to improve integrity and adherence to the code of conduct by tracking and publishing the number of breaches of its code, some of which are reported via its whistleblowing protocol. This demonstrates effective deployment of policies and a culture that values and respects integrity.

- The company tracks the gap between top executive pay versus median pay, but does not track a gender pay gap. Because TenneT is state-owned and highly regulated, stakeholders watch executive management's pay closely. For TenneT, the CEO-to-median employee pay ratio is 5.59x, which is on the lower end for corporate entities. For a company without competition, we view this as a strength because it improves electricity affordability for end users, in line with the company's core values.

Transparency and Reporting

- TenneT has stronger regulatory requirements than most companies because it is required to justify how all capex is spent to the regulator, and therefore track all financial flows. Also, the company voluntarily discloses additional financial and nonfinancial information to stakeholders.

- In addition to stringent reporting and transparency around financial capital, its regulated nature has led to increased reporting demand on all financial accounts.

- TenneT is an active green debt and hybrid issuer. We view these issuances as having stronger transparency and reporting requirements, which include environmental performance metrics such as avoided GHG emissions.

Cyberrisks and Systems

- Cyberrisks are high for both the TSO and the network given its status as critical infrastructure and the implications for national security. TenneT is under constant threat and could be vulnerable to low-probability, high-impact attacks.

- The company recognizes cyberrisk as material. The senior cyber manager reports cyber-related topics directly to the CEO and executive board. In addition, TenneT has a legal obligation to report cyber-related incidents to the appointed regulators in the Netherlands and Germany. In line with peers, the company does not disclose incidents publicly. However, it has an ISO 27001 certification, which requires formal management review of cybersecurity.

- Employees receive training annually and as part of onboarding. As far as has been detected, TenneT has not had any successful cyberattacks against it.

General Factors (None)

- We have not adjusted the governance profile.
Preparedness Opinion

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Summary Opinion

We view TenneT's preparedness as strong, supported by excellent awareness of long-term risks and opportunities, excellent assessment of the potential impact of its business, and action planning to mitigate potential risks and take advantage of opportunities. The company's good culture further supports the strong preparedness because it has shifted to focus on innovation and transformation from a steady business. Finally, we assess TenneT's decision-making as good given its new partnerships with businesses outside its industry and integration of people and planet into the supervisory board's investment committee process.

The company's strategy is to maintain security of electricity supply in the Netherlands and Germany, while connecting new renewable energy to the grids, providing low-cost electricity to end users, and maintaining a healthy financial profile. TenneT is a key enabler of the energy transition to a less carbon-intensive generation mix, and that is what determines the amount of the company's capex. To achieve its strategy of delivering the energy transition, the company will need to collaborate across industries new to the TSO sector. We believe this strategy is resilient despite risks from a change of political regimes within the two countries where it operates because of its effective scenario analysis, stakeholder engagement, and action planning.

TenneT's supervisory board is very involved in strategy, risk identification and assessment, and the company's decisions on capex, taking into consideration various factors like long-term energy mix, demand, technological changes, costs, and affordability for consumers.

Awareness

| Awareness       | Developing | Good    | Excellent |        |

We view TenneT's awareness as excellent. The supervisory board works with the executive management to review emerging risks and opportunities to the strategic vision, supported by an inclusive risk-identification process and biannual strategic review that leverages insights from internal, external, and academic stakeholders. The supervisory and executive boards participate in biannual discussions on long-term strategic risks organized by their risk and financial control department. These vary in format; for example, in 2018, the discussions focused on several high-profile cases that indirectly related to TenneT's business (such as Dieselgate) to see if this could happen to the company, how it might occur, and what its reaction would be. This demonstrates flexibility in thinking, which supports excellent awareness. In addition, TenneT uses standard processes to identify risks via interviews and interactive workshops with key stakeholders within the organization. The outcome, "State of Risk," is reviewed twice a year by the executive and
Preparedness

supervisory boards together. The process itself is reviewed every year via an internal audit. Strategic risks are linked to strategic goals for tracking purposes.

**Assessment**

We view the executive team’s ability to assess long-term and strategic risks as excellent because the team discusses in detail the risks and opportunities of various and how they affect the company’s strategy. The strategic direction increases operating complexity because of the uncertainty of generation output associated with renewables. TenneT assesses the risk using quantitative modelling and scenario analysis, which allows it to understand where uncertainties lie and the likely impact on its business. For example, one of the company’s key roles is ensuring security of supply in the networks, so integrating more renewable assets might jeopardize that security, and scenario planning helps TenneT work toward optimizing network capacity. The company uses three different scenarios incorporating political, technology, and consumer-related risks identified in the State of Risk reports, with clearly articulated assumptions and a 30-year time horizon. TenneT demonstrates an ability to reimagine how demand for its services might change over that time. For example, a self-generating consumer will use the network less, but will suddenly need to access it if their renewable assets are not generating. This new customer profile uses the grid intermittently affects decisions made today as the company adapts its asset base to be more flexible.

Furthermore, TenneT’s scenario planning looks at how regulations regarding carbon-neutrality by 2050 are enforced and assesses how this affects affordability or the risk of people going off-grid. Its conclusion is that, under the current sustainability goals for carbon neutrality, the easiest solution for many sectors is to electrify, and assumes this will raise demand by 4x-5x. The company can also articulate how much energy storage would be necessary under this scenario, actually quantifying the risk (15 terawatt hours’ storage, which is equivalent to each Dutch citizen having 15 Teslas to store this amount in their electric vehicles).

**Action**

We view TenneT's action plans over the next 10-15 years as excellent because it can articulate resilient plans based on what it learned from assessing various risks. The company is planning for what grid operations will look like and making sure the grid is not overbuilt. It's planning on gathering data needs, for example by partnering with the auto sector to acquire data from vehicles that can monitor fog. This could help TenneT plan how to measure solar output, and demonstrates how it incorporates long-term thinking into its planning; it can leverage the data and analytics as digital assets. It accepts that it will ultimately need fewer physical assets. The company is strategically aiming for a more digital asset base, using data and technology, to avoid stranded asset risk, prevent overbuilding, and enhance its strategic resilience.

Under the dual board system, the executive board is responsible for addressing the risks identified in the State of Risk reports, including the follow-up action. The supervisory board monitors how the executive team is addressing these risks throughout the year through regular interactions. The company's annual reporting also include mitigating actions. Thresholds are included in the risk matrix used when planning, following the scenario analysis work. A responsible manager is held responsible for each, which provides accountability.
Preparedness

**Culture**

We view the recent shift in culture within the organization as positively supporting its long-term preparedness, which we assess as good. TenneT's business has been shaped by its recent very strong growth from a surge of renewable generation assets that have to be connected to the networks both in the Netherlands and in Germany. Management is transforming company culture from being "too risk adverse" with a stable business to creating more tolerance for the transition and rapid growth. For example, the company set up an end-to-end process to steer departments into thinking laterally across the organization. TenneT is also linking performance and talent management to its long-term strategy and formed the "Coalition of the Daring"—an initiative where employees can send in videos and drawings of their ideas to propel transformative change. The group has 100 employees, empowered to explore implementation of their ideas, which we view as evidence of an inclusive culture. In our view, this shift fosters a culture that considers environmental and social factors, namely the energy transition, and its associated impact on the workforce and communities. TenneT's strategy depends on more collaboration with new partners, and we believe the company has demonstrated this within its new culture. The company collaborates with many partners, such as the Research And Development And Innovation Committee (the TSO industry organization for Europe). It has also used other small groups for collaboration like North Sea Island, a wind power hub where network providers are working with the Port of Rotterdam.

**Decision-making**

We view TenneT's decision-making as good and supported by clear articulation of its strategy to stakeholders and a strategically aligned capex plan. The executive board is focusing on the next shift in technological innovation, namely how to interpret international climate discussions and better organize its innovation projects using portfolio management. Backlog issues remain stemming from its ongoing rapid growth. Each executive board member has a portfolio of innovations and is testing new strategies. Many projects are underway, and a separate innovation committee ensures adequate oversight. The executive board sets the decision-making rules on when to start and stop a project.

ESG topics are embedded in the company's strategy given the focus on energy transition, safety and affordability. In the Netherlands, TenneT will spend €5.5 billion over the coming 10 years to expand its onshore transport capabilities and €7.0 billion to connect offshore wind generation in the Netherlands; and €16.0 billion and €7.0 billion for the same, respectively, in Germany. The supervisory board reviews all investments over €50 million in its strategic investment committee, which explicitly considers the impact on stakeholders. This committee meets six times a year to review capex decisions. In total, TenneT expects to spend €35 billion in 10 years into its German and Dutch regulated asset base, facilitating each country's energy transition. Therefore, ESG themes are a key focus for TenneT. Remuneration incentives and executive management targets are aligned with ESG principles.

TenneT believes that it needs to innovate to anticipate changes in its sector, bring down costs, and meet its regulatory requirements. The company does small-scale investments to try solutions to their observed strategic risks, for example with storage. By law, TenneT cannot become a generator, and storage providers might be seen as generators one day. Therefore, it is exploring partnerships with energy storage providers such as electric vehicle manufacturer Nissan. We view this as evidence of good decision-making because is able to pursue new strategic directions and work across industries to reimagine how consumers receive electricity.
Appendix

Sector/Region Risk

<table>
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<th>Primary Sector(s)</th>
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<tr>
<td>Primary Operating Region(s)</td>
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Sector Risk Summary

TenneT operates in only one sector, regulated utility networks, which has fewer environmental risks than the power generation assets of integrated utilities. Social risks are a larger source of risk exposure for this sector.

Environmental exposure

The regulated utilities network sector’s environmental risks are focused on its pure infrastructure status rather than fossil-based emissions. The key risk that effects electric transmission and distribution networks is their exposure to climate change, including wildfires, storms, hurricanes, and tornadoes. To protect against some of these risks, networks are undergrounding and hardening their systems, making them somewhat less susceptible to climate change. For natural gas networks, we focus on gas explosions and leaks that emit GHGs and may affect biodiversity. For water networks, environmental risks are primarily focused on clean water and water usage (i.e., spills and losses). Another area of environmental focus is droughts, which could cause water shortages for water networks and can increase the risks of wildfires for electric networks.

Social exposure

The regulated utilities network sector plays a crucial role for communities. Network operators provide energy, gas, or water to people and organizations, and these services require satisfactory customer service. Any disruption to these services would trigger potential negative political pressures or put at risk their license to operate. Customers need to consider the fees for services as fair, and we see increased social and regulatory pressures in terms of acceptability of tariffs. Maintaining a reliable, safe, and viably economic network is thus key to managing regulatory risk and public opinion. Developing new infrastructures also implies land use and permits, which can create conflicts with local communities. For gas networks, safety management is key (incidents typically have larger impact/human death toll). Finally, utilities are generally major local employers with many unionized employees, which exposes them to human capital management risks.
Appendix

Sector/Region Risk

Regional Risk Summary

TenneT operates in both the Netherlands and Germany, with the majority of assets (72%) in Germany. Both the Netherlands and Germany have strong corporate governance standards and limited natural disaster risk.

Germany

Germany has strong institutional and governance effectiveness, with much transparency and accountability. The rule of law is strong, the judiciary is independent, and corruption is viewed as a minor issue. Germany has a moderate amount of ESG regulation. While Deutsche Börse AG doesn't require ESG reporting as a listing rule, companies of over 500 employees are implementing the EU Non-Financial Reporting Directive's recommendations, which mandate the disclosure of ESG data like diversity and pay ratios. The German Corporate Governance Code (Kodex) is the reference document for Germany's best practices and works on a comply-or-explain basis. While the recommendations are much less specific than most European codes, companies exhibit strong governance practices. Companies are typically governed by a two-tier board system, an executive board overseen by a supervisory board comprising non-executives, including shareholder and employee or labor union representatives. While not world-leading, there are corporate disclosure requirements for selected ESG aspects, and both occupational pension funds and insurers must inform on whether and how they account for ESG considerations when managing pension fund assets under their control.

Netherlands

The Netherlands has strong institutional effectiveness and rule of law. It has a very active pension fund industry that has been a leader in sustainable investing and stewardship, creating an advanced ecosystem for sustainable finance. In terms of reporting, companies of over 500 employees are implementing the EU Non-Financial Reporting Directive's recommendations, which mandate disclosing ESG (including diversity) risk. Compared to other European countries, the Netherlands has more dispersed ownership structures with few controlled listed companies. The Frijns Committee (Corporate Governance Code Monitoring Committee) publishes the Dutch Corporate Governance Code, last edited in 2017. The code follows the stakeholder model and focuses on long-term sustainability. There is a high level of compliance with the code's recommendations. Equally, the new Dutch Stewardship Code went into effect January 2019 and considers all stakeholders' interests, not just shareholders'. In February 2019, the government completed a consultation period on a bill proposal to implement a 250-day thinking period for boards. The proposal, which could be an anti-takeover mechanism, raised concerns about shareholder rights because it would give the supervisory board 250 days if shareholders submit a proposal to appoint or remove a director, or if there's a takeover bid. Shareholder rights provisions are otherwise strong, including a binding vote on executive remuneration.
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