



Institute for Energy Economics
and Financial Analysis

Europe's Clean Power Leaders: How Green Financing Is Enabling Renewable Growth

Assessing Readiness to Issue With the European Green Bond Standard

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Contents

Key Findings4

Executive Summary5

Green Bonds Have Become an Important Tool for European Power Generators6

Some Advanced Utilities Show High Preparedness in Aligning Their Issuances with the EUGBS7

European Utilities Have Come a Long Way in Displaying Proceeds’ Allocation and Impact11

Tendency to Show a High Green Bond Standard Indicates Leading Environment Performance18

Statkraft: A Hydropower Giant22

Ørsted: World Leader in Offshore Wind24

Iberdrola: Shift From a Conventional Utility to a Global Renewable Leader27

EDP: Targeting 100% Renewables by 203029

About IEEFA.....31

About the Authors31

Figures

Figure 1: Green Bond Issuance Has Shown Strong Traction Among Europe's Electric Power Sector	6
Figure 2: Most Utilities' Frameworks Specify Strong Intention to Align With the SCC	8
Figure 3: But Fewer Have Specified Commitments to the DNSH Criteria	8
Figure 4: More Than Half the Utilities Have Shown Better Practice of Acquiring External Opinion on Frameworks' EU Taxonomy Alignments	9
Figure 5: One Has Gone Further by Committing to External Review of Allocated Proceeds with EU Taxonomy.....	9
Figure 6: Utilities' Varying Impact Reporting Quality Lowers Comparability	12
Figure 7: Most of the Utilities Have Not Obtained External Reviews on Taxonomy-Aligned Allocations.....	14
Figure 8: Some Companies Obtained External Assurance on Impact Metrics, Going Beyond EUGBS Requirements	14
Figure 9: Four Pillars of How a Track Record of European Green Bond Issuance Can Translate Into Lower Transition Risks	18
Figure 10: The Extent the Utilities Adopt Use-of-Proceeds Green Financing as a Debt Funding Channel Varies	19
Figure 11: Some Advanced Utilities Show Meaningful Environmental Sustainable Capex Pipelines and Operational Activities Fuelled By Successful Green Financing	21
Figure 12: Statkraft Power Capacity Mix by Technology.....	22
Figure 13: European Power Utilities' Average CO ₂ Emission Factor (kg/MWh), 2022 Data.....	24
Figure 14: Ørsted Power Capacity Mix by Technology.....	25
Figure 15: Iberdrola Power Capacity Mix by Technology.....	27
Figure 16: EDP Power Capacity Mix by Technology	29

Tables

Table 1: IEEFA Observes Some Prominent Information Missing From Most Frameworks Assessed	10
Table 2: European Power Utilities Can Benefit From Enhancing Transparency	16

Key Findings

Europe's advanced utilities have demonstrated a track record of green bond issuance to fund their successful renewable energy buildout and transition progress.

12 key green bond issuers in Europe's power sector have applied sustainable financing frameworks that show some degree of preparedness to align with the upcoming European Green Bond Standard (EUGBS).

Most of the 12 utilities have consistently reported on their green bond allocations and impacts with varied degrees of external assurance.

Additional transparency and alignment efforts are required; in IEEFA's view, utilities can benefit from EUGBS-aligned issuances by showing credibility and coherence with their renewable energy strategy and transition plans.



Executive Summary

This report studies Europe's electric power generation sector, given the significant role it must play in the energy transition towards a more sustainable economy. Green bond issuance among Europe's electric utilities has risen strongly; growth momentum will likely continue on the back of European Union renewable energy targets. Long-term green bond supply is underpinned by ample projects and investment needs for the net-zero transition.¹

The 12 European power utilities under this study are among the largest green bond issuers in the sector. IEEFA assesses the quality of their green bond instruments at pre- and post-issuance and reviews how they can leverage the upcoming European Green Bond Standard (EUGBS)² to reflect a better management of transition risk.

All utilities have published robust, externally reviewed green financing frameworks that govern their green bond issuances. One benefit of the EUGBS comes from the clarity of science-based use-of-proceeds criteria, with which most of the utilities show a strong intention to align. In IEEFA's view, it is not overly costly for European utilities to enhance their reporting capacity and adhere to the EUGBS; this can benefit them by displaying more comprehensive commitments and credible capital expenditure pipelines, thereby exhibiting lower transition risk.

European power utilities have published regular post-issuance reporting as promised. Their efforts in displaying timely allocation and impacts have shown a generally robust level of corporate governance and risk management. Some advanced players have quantified their impacts by exhibiting meaningful additional renewable energy capacity and annual renewable generation attributable to green financing, although impact reporting comparability remains a challenge. Advanced players—usually illustrated by high readiness to adopt the EUGBS and a high proportion of green financing in their capital structure—may lower their transition risk through another pillar: green asset delivery.

This report also studies a selection of advanced players that are leaders in terms of energy transition progress, due to either their almost entirely renewable capacity mix, their ambitions towards net-zero emissions or their firm commitment to a fossil fuel exit date. Statkraft, Ørsted, Iberdrola and EDP stand out from the pack. However, this selection is partial and certainly not exhaustive in terms of energy transition achievements.

¹ IEEFA. [Will Europe's new standard help or hinder green bond market growth?](#) 19 February 2024.

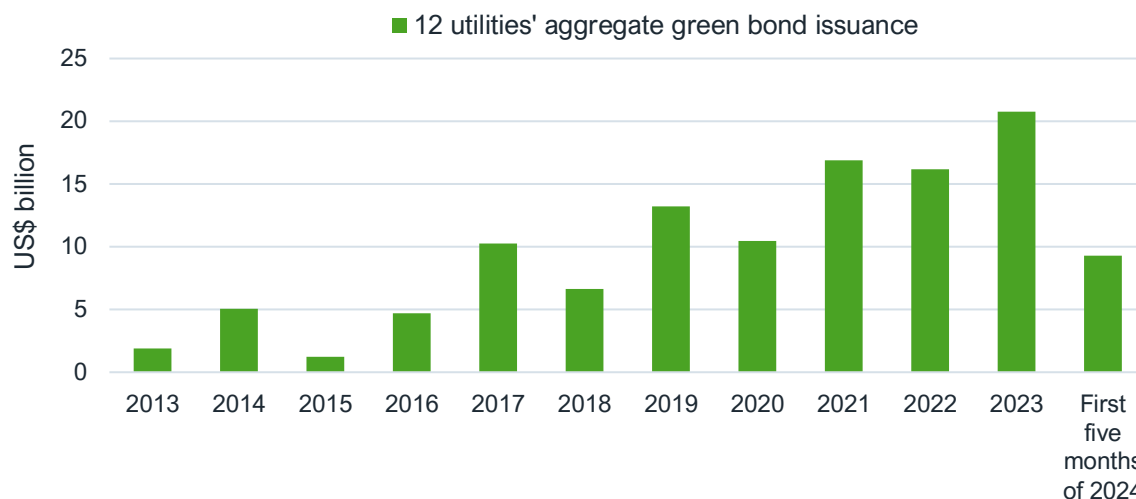
² [Regulation \(EU\) 2023/2631 of the European Parliament and of the Council of 22 November 2023 on European Green Bonds and optional disclosures for bonds marketed as environmentally sustainable and for sustainability-linked bonds](#). The regulation will start applying in December 2024. Bonds issued may then voluntarily use the label 'European Green Bond' or 'EuGB' if they choose to align with the standard.

Green Bonds Have Become an Important Tool for European Power Generators

The focus of this study is to assess the 12 prominent green bond issuers in the European power utility sector,³ which intend to primarily use their green bond proceeds for the development of renewable energy projects.⁴ These 12 utilities have accounted for around 7% of Europe's total green bond issuance to date.

Europe's green bond issuance reached a record level of US\$347 billion in 2023,⁵ US\$12 billion of which was issued by the 12 utilities. Nine of the 12 companies have issued green bonds this year: Issuance in the first five months totalled US\$9.3 billion, indicating strong momentum for the year.

Figure 1: Green Bond Issuance Has Shown Strong Traction Among Europe's Electric Power Sector



Source: Environmental Finance Data (accessed 6 June 2024), IEEFA.

The European Union (EU) has a binding target of 42.5% renewables in its energy mix by 2030.⁶ According to WindEurope,⁷ 18.3 gigawatts (GW) of new wind capacity was installed in Europe in 2023, of which a record 16.2GW was deployed in the EU. An additional 33GW of new wind capacity is needed annually between 2024 and 2030 to meet the EU 2030 target of 425GW. Meanwhile, the EU solar energy strategy⁸ aims to grow total photovoltaic generation capacity from 260GW in 2023 to over 320GW by 2025 and almost 600GW by 2030.

³ The scope of the paper focuses on utilities with a significant proportion of electricity generation. Highly diversified utilities or utilities with large electricity and gas transmission system operations such as Snam, E.ON and TenneT are broadly excluded from this study.

⁴ The utilities in the scope of the paper may also use green bond proceeds on other non-power generation projects.

⁵ Based on Environmental Finance Data extracted on 6 June 2024 and IEEFA calculations. See Environmental Finance Data's [methodology](#).

⁶ Official Journal of the European Union. [Directive \(EU\) 2023/2413 of the European Parliament and of the Council of 18 October 2023 amending Directive \(EU\) 2018/2001, Regulation \(EU\) 2018/1999 and Directive 98/70/EC as regards the promotion of energy from renewable sources, and repealing Council Directive \(EU\) 2015/652](#). 31 October 2023.

⁷ WindEurope. [Wind energy in Europe: 2023 Statistics and the outlook for 2024-2030](#). 28 February 2024.

⁸ European Commission. [EU solar energy strategy](#). May 2022.

Beyond 2030, investments in EU power plants alone will need to reach an average of €142 billion annually over 2031-2050,⁹ considering the bloc's 90% net emissions reduction target by 2040, relative to 1990 levels.

While both private and public funding is needed to meet the required investments, these selected utilities play a key role in the deployment of renewable energy capacity in Europe. The use-of-proceeds green bonds are thereby a key source of their funding. The European Green Bond Regulation's European Green Bond (EuGB) label is fit for purpose, as it links to the EU taxonomy technical screening criteria, which aligns wind and solar projects by default. As these large utilities are likely to ramp up their investment plans to contribute to EU climate and renewable goals, their reliance on green financing is likely to grow. Adopting the EuGB label could bring benefits for both issuers and investors. This paper notes the successful green financing and renewables growth of these utilities and assesses their readiness to adopt the label.

Some Advanced Utilities Show High Preparedness in Aligning Their Issuances with the EUGBS

All 12 utilities have published a green financing framework that governs their green bond issuances. All frameworks are structured in accordance with the International Capital Market Association Green Bonds Principles¹⁰ (ICMA GBP), in line with common market practice.

The upcoming EUGBS could prominently address pitfalls of ICMA GBP's principal-based criteria, in IEEFA's view. In particular, the EUGBS increases the clarity of use-of-proceeds eligibility with the technical screening criteria-based EU taxonomy—consisting of substantial contribution criteria (SCC) and do no significant harm (DNSH) requirements.¹¹ Some utilities studied are among the most advanced players in pure renewable energy development, thereby showing high readiness to align with the EUGBS use-of-proceeds conditions by design.¹²

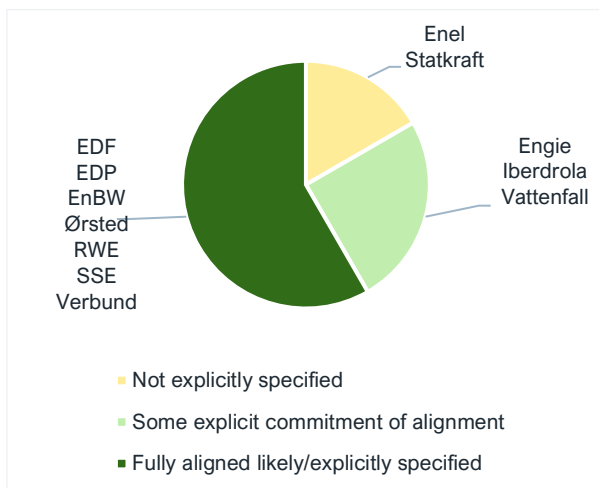
⁹ European Commission. [Communication on a 2040 Climate Target](#). 6 February 2024.

¹⁰ International Capital Market Association. [Green Bond Principles](#). June 2021 (with June 2022 Appendix 1).

¹¹ European Commission. [EU Taxonomy Navigator](#).

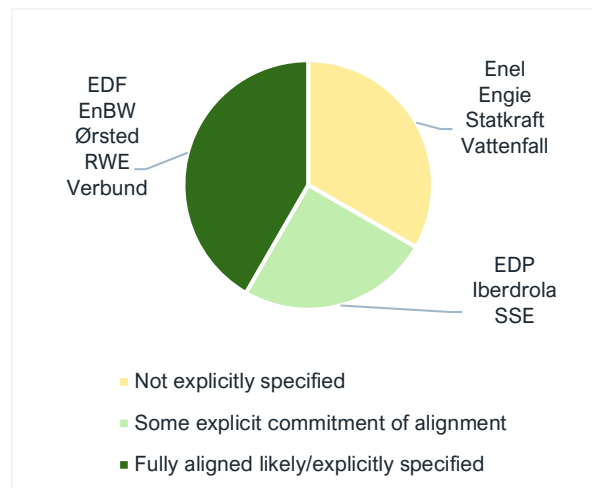
¹² The activities of 'electricity generation from wind power' and 'electricity generation using solar photovoltaic technology' automatically comply with the substantial contribution criteria for climate mitigation.

Figure 2: Most Utilities' Frameworks Specify Strong Intention to Align With the SCC



Source: Company green/sustainable finance frameworks, IEEFA.

Figure 3: But Fewer Have Specified Commitments to the DNSH Criteria



Source: Company green/sustainable finance frameworks, IEEFA.

Ørsted A/S, the world's largest offshore wind developer, and EDP - Energias de Portugal, S.A., Portugal's main electric utility, define their green bond-eligible projects as offshore and onshore wind and solar projects only,^{13,14} which makes them automatically aligned with the EU taxonomy SCC (Figure 2).

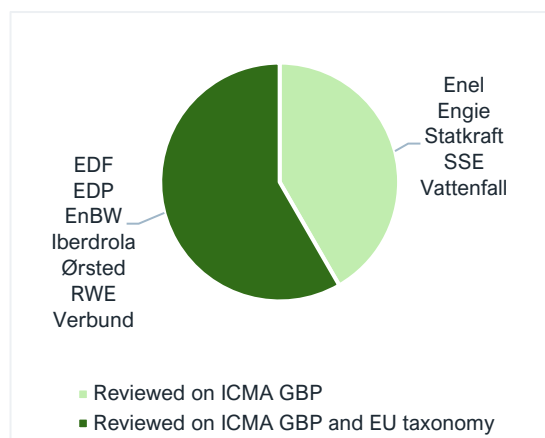
Furthermore, Ørsted reports that it "evaluate[s] that all [its] eligible projects meet the do no significant harm criteria". This appears to be a more explicit commitment referenced to the technical screening criteria than EDP's statement that "the Eligible Green Assets do not significantly harm any of the remaining environmental objectives laid out by the EU" (Figure 3).

All 12 utilities show clear reporting commitments and external reviews at pre-issuance. IEEFA identifies that some utilities go beyond the recommendations of ICMA GBP. External reviews on the alignment with the EU taxonomy at pre-issuance, combined with a clear commitment to an external review on the alignment with the EU taxonomy at post-issuance, reflects higher readiness to adopt the EuGB label with future issuances.

¹³ Ørsted. [Green finance framework](#). May 2022.

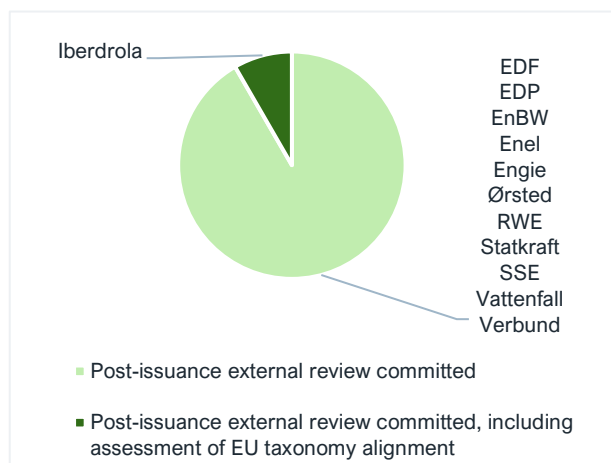
¹⁴ EDP. [Green Finance Framework](#). 13 September 2023.

Figure 4: More Than Half the Utilities Have Shown Better Practice of Acquiring External Opinion on Frameworks' EU Taxonomy Alignments



Source: Company green/sustainable finance frameworks, IEEFA.

Figure 5: One Has Gone Further by Committing to External Review of Allocated Proceeds with EU Taxonomy



Source: Company green/sustainable finance frameworks, IEEFA.

Iberdrola's framework¹⁵ does not fully and explicitly specify the use of proceeds' alignment with the EU taxonomy's technical screening criteria (Figures 2 and 3). The company says the alignment is "confirmed to the finance & treasury department by the sustainable development team" in its project evaluation and selection process.

Having said this, Iberdrola has obtained an external review on the EU taxonomy (Figure 4). The review¹⁶ shows that smart grids, renewable energy, sustainable customer solutions and electric mobility categories adhere to SCC, while green hydrogen does not. Most eligible activities are reviewed to adhere to DNSH except the transmission and distribution of electricity activity.

Iberdrola further commits that its annual green financing returns report will be verified by an auditor and the independent assurance will cover the alignment of the projects allocated to the outstanding green financing instruments with the EU taxonomy (Figure 5). This serves as a best practice among the utilities of study.

On the other hand, IEEFA largely observes inadequate disclosure of the green financing frameworks against the requirements set out by the EUGBS. This is understandable as the frameworks are usually published before issuance and may apply to multiple bond issuances (the timing between framework publication and issuances varies). The frameworks do not contain issue-specific information.

¹⁵ Iberdrola. [Framework for Green Financing](#). December 2023.

¹⁶ Moody's Investors Service. [Iberdrola S.A.: Second Party Opinion – Framework for Green Financing Updated SQS1 Sustainability Quality Score](#). 19 December 2023.

Table 1: IEEFA Observes Some Prominent Information Missing From Most Frameworks Assessed

Items Missing	IEEFA's Comments
Environmental strategy and rationale: contributions of bond proceeds to an environmental strategy and taxonomy-aligned key performance indicators and transition plans	Most issuers display a clear environmental strategy; some advanced issuers have Science Based Targets initiative-approved targets in line with a 1.5-degree pathway. But it is important to explicitly illustrate the significance of the contribution. An isolated case of green bond issuance accounting for a small part of the company's capital structure may appear to have very limited impacts. By contrast, significant contributions to the company's transition plan—if described in detail—can showcase its seriousness in achieving its targets.
Intended allocation of bond proceeds: process and timeline for allocation	Without an indication of a clear timeline, issuers may delay allocation, particularly for long-dated bonds, which in turn delays environmental impacts.
Estimated environmental impact of bond proceeds	Without such indication, it is difficult to hold the final environmental impact accountable. Impact metrics such as annual carbon dioxide (CO ₂) emissions avoided depend largely on the CO ₂ avoidance factor in the region or country of operations and are hence difficult to gauge or predict relative to the size of the bond offerings. IEEFA does positively note that most issuers are committed to assessing and calculating expected benefits.
Detailed description of capital expenditure (capex) plan	Plans relating to issues are not specified, although some issuers disclose (separately) their overall company-level growth plan. Issuers may demonstrate the plausibility of their investment plans by tying the instrument with a concrete project pipeline, which forms the overall company environmental strategy.

Source: IEEFA.

For each bond issuance intending to obtain the EuGB label, it will have to prepare additional information to fulfil the EUGBS green bond fact sheet. This is not impossible for these large European utilities to do, nor does it significantly add to their cost burden, especially for those that have formulated Science Based Targets initiative-approved 1.5-degree-aligned targets. Enhanced transparency will allow investors to predict the issuer's decarbonisation progress and environmental impacts with higher assurance. In return, these issuers may be perceived to be better at managing transition risk by more comprehensively displaying their commitments and capex pipeline.



Enhanced transparency will allow investors to predict the issuer's decarbonisation progress and environmental impacts with higher assurance.

European Utilities Have Come a Long Way in Displaying Proceeds' Allocation and Impact

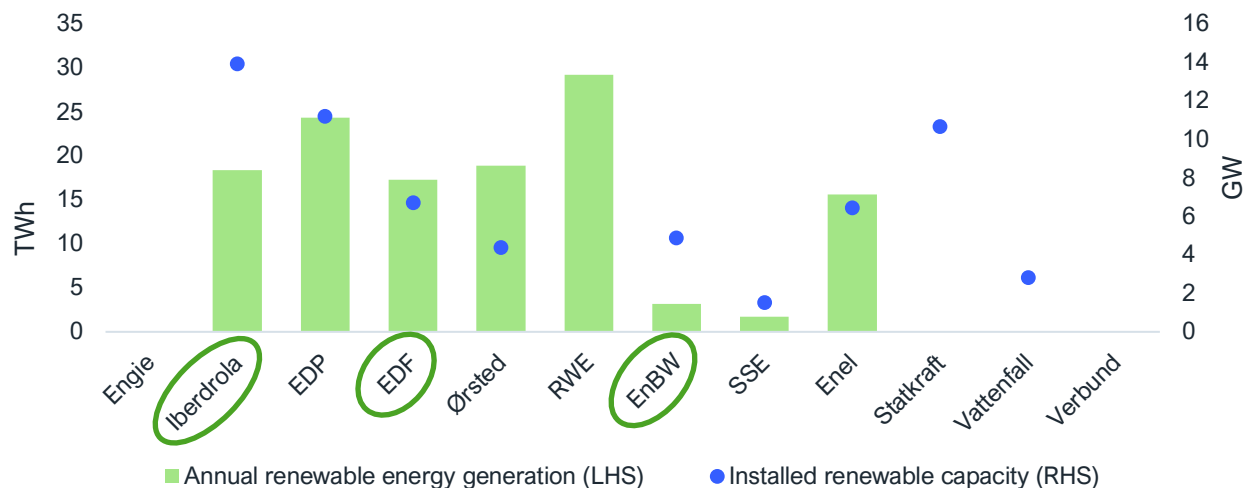
IEEFA recognises that all the utilities have regularly published allocation and impact reports according to their commitments set out in the frameworks. The companies tend to show timely allocations with disclosed allocated proceeds to a reasonable detail that would help them prepare for the EUGBS.

Most of the utilities have not clearly specified the amount that is aligned with the EU taxonomy, but IEEFA recognises that SCC are more likely to be fulfilled for the utilities that primarily allocate their proceeds on renewable energy projects. Meanwhile, DNSH criteria may require further review and assurance. On this note, the European Commission will need to show leadership by enhancing the usability of the DNSH criteria and setting an example by aligning its own NextGeneration green bonds with the criteria.¹⁷

All the utilities have reported on their environmental impact metrics, commensurate with the EUGBS. IEEFA notes that one pitfall of the EUGBS is that it has not yet provided comprehensive guidance on impact reporting. However, utilities have reported somewhat uniform metrics such as annual CO₂ emissions avoided, annual renewable energy generation and capacity of renewable energy production—referencing the International Capital Market Association's Harmonised Framework for Impact Reporting sector guidance for renewable energy.¹⁸ This has allowed investors to compare environmental returns of the bond proceeds to some extent. Not all utilities reported each of these metrics; metrics that are not explicitly attributable to green financing may appear inflated. Also, not all have described their methodology and assumptions of the metrics comprehensively. This is particularly important for emissions avoided, which are based upon assumptions of countries' carbon avoidance factors.

¹⁷ IEEFA. [Will Europe's new standard help or hinder green bond market growth?](#) 19 February 2024.

¹⁸ International Capital Market Association. [Harmonised Framework for Impact Reporting](#). June 2022.

Figure 6: Utilities' Varying Impact Reporting Quality Lowers Comparability

Source: Company green bonds impact reports, IEEFA.

Notes:

- Iberdrola, EDF and EnBW (circled) are those that explicitly report on the metrics attributable to green financing.
- EDF reports only estimated annual renewable energy generation.
- EnBW's reported capacity includes a project that is still in the design phase.
- Engie does not report these two impact metrics.
- Statkraft reports only the annual renewable energy generation of the projects with allocated proceeds during the year but not the metrics attributable to the aggregate green financing.
- Verbund reports on annual generation between 2015-2022 for the 2014 green bond but does not report installed capacity attributable to the bond.

Iberdrola, the second-largest green bonds issuer in the sector, comprehensively reports all its allocated assets for each bond instrument, detailing the name, location, start-up year and installed capacity attributable to the bond.¹⁹

In 2023, Iberdrola reported 14GW of installed renewable energy capacity attributable to green financing totalling €23 billion. This contributes to the company's total installed renewable capacity of 42GW. Continued green bond issuance would aid the company in reaching its 2024-2026 plan and beyond (see [next section](#)).

However, Iberdrola has not detailed the assumptions and sources used in calculating the metrics.

Statkraft comprehensively reports all its annual allocated proceeds by project, detailing the name, location, start-up and completion year, and installed capacity, but the installed capacity attributable to the green bond proceeds is unclear.²⁰

The company shows a good practice of explicitly indicating the proceeds' alignment with the EU taxonomy by project, despite lacking external review on this front. Continued green bond issuance would contribute to its plan to increase renewables (see [next section](#)).

External review on the allocation and impact, despite not being mandatory under the ICMA GBP, plays an important role in upholding the integrity of the reporting. Those that have not had an existing external review in place for allocation (mandatory for the EUGBS) will be positioned unfavourably in adopting the EUGBS. Meanwhile, those that have had an existing external review in place for impact (not mandatory for the EUGBS) will show additional quality in their reporting.

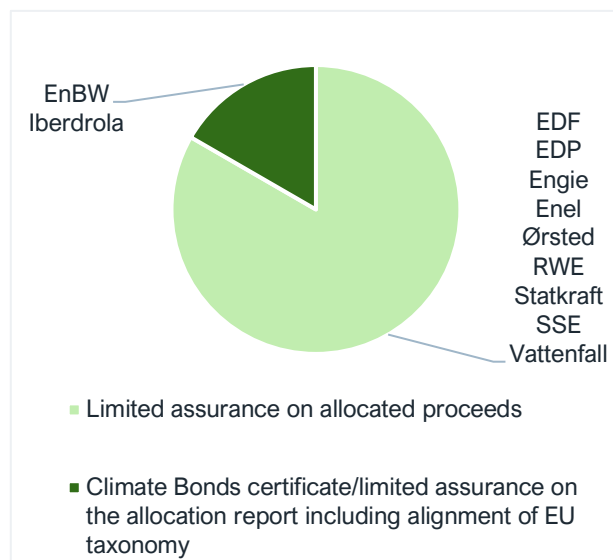
EnBW is the only issuer within this study that has obtained pre- and post-issuance certification by the Climate Bonds Initiative (Figure 7) in accordance with the Climate Bond Standard²¹—the higher standard currently available. EnBW referred to the EUGBS in its reporting, which shows some intention of future EUGBS adoption, but it isn't clear whether EnBW's current external review provides assurance on its full allocation and impact reports (Figure 8).

¹⁹ Iberdrola. [Green financing returns report—Year 2023](#).

²⁰ Statkraft. [Annual Report 2023, page 41](#).

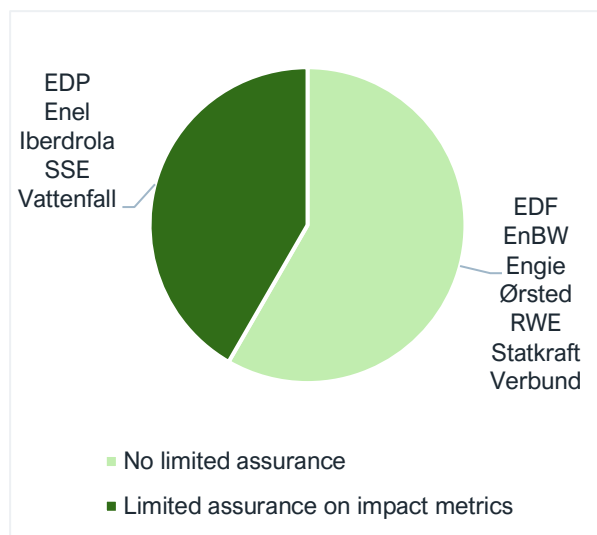
²¹ Climate Bonds Initiative. [Climate Bonds Standard Version 4.1](#). February 2024.

Figure 7: Most of the Utilities Have Not Obtained External Reviews on Taxonomy-Aligned Allocations



Source: Company green bonds allocation and impact reports, IEEFA.

Figure 8: Some Companies Obtained External Assurance on Impact Metrics, Going Beyond EUGBS Requirements



Source: Company green bonds allocation and impact reports, IEEFA.

Similar to the pre-issuance frameworks, some prominent information is missing from the allocation and impact reports:

- Environmental strategy and rationale: contributions of bond proceeds (including final contributions after full allocation) to the environmental strategies and taxonomy-aligned key performance indicators and transition plans.
- Capex progress in relation to plans, although most issuers list their projects with some detailed description including capacity, project status and construction period.

It is worth noting that this information should concur with pre-issuance disclosure. Without clear disclosure at pre-issuance, it is difficult to measure or predict whether the environmental returns are in line with plans. Limitations on impact reporting may also arise at times from unclear ex-ante versus ex-post nature of the reported metrics and some varied definitions and assumptions being considered. Table 2 illustrates how European power utilities can display the contribution to their transition plans. Most utilities have in place a medium-term (for example, three-year) business strategy including a renewable buildout plan with capacity and investment targets—the improved pre-issuance information would establish the relevance of green financing.

Verbund²² is the only utility in this study issuing sustainability-linked green bonds, which demonstrates green financing's coherence with the company's transition plan. One of the two sustainability performance targets is to deploy 2GW of renewable energy capacity by 2032 (with a base year of 2020), linked to its €500 million issued in 2021 (the other target relates to transformer capacity). As of 2023, 0.5GW of additions had been reported, indicating progress.

The company further reports in a detailed description on all the projects to which the bond proceeds were allocated. One of these is a hydro rehabilitation project, which is expected to add 0.32GW of capacity and 139 gigawatt-hours (GWh) of generation, in line with the contribution to renewables deployment set as a sustainability performance target. Having said that, the company has not yet reported its impact metrics attributed to this issue.

IEEFA generally commends European power utilities' efforts in displaying timely allocation and impacts. While the issuers are on the journey of enhancing transparency, one way to increase the incentive of generating timely impacts from the green bond proceeds is to utilise a sustainability-linked structure while adopting the EUGBS (Table 2). This can be achieved by combining taxonomy-aligned use-of-proceeds criteria with incentives linking to sustainability performance. The sustainability performance targets can be linked to impact metrics or contributions to taxonomy-aligned activities. This can also create an innovative label and deepen EUGBS useability before the regulation of sustainability-linked bond (SLB) markets takes place.

²² Verbund. [Impact Report 2023](#).

Table 2: European Power Utilities Can Benefit From Enhancing Transparency

Illustration of how European power utilities can show coherence with their business strategy under the EUGBS framework and combine the use of sustainability-linked structures to add credibility to impact returns.

EUGBS-aligned disclosure				Setting sustainability performance targets		
Issue specific: pre-issuance (2024) (A)	Issuer level: pre-issuance (B)	Issue specific: allocation (2024-2027) and impacts (2027 and beyond) (C)	Issuer level: transition results (D)	Issue specific: (test year 2027)	Issue specific: (test year beyond 2027)	Issuer level (test year 2027)
<ol style="list-style-type: none"> Measuring A as a % of B to display the coherence and relevance of the issue to the issuer’s transition plan and strategy Comparing A with C to assess how well the company meets its bonds’ expected contributions Measuring C as a % of D to display the actual contributions of the bonds to the issuer’s transition progress Comparing B with D to assess how well the company meets its overall targets 				Measure against C	Measure against C	Measure against D
Green bond issue amount (€) and allocation timeline (fully allocated by 2027)	Issuer’s total debt outstanding (€); expected investments in renewable energy (€) based on renewable buildout plan 2024-2027	Allocated proceeds (€)	Actual investment in renewable energy (€) between 2024-2027	-		
Project description: renewable energy	Renewable buildout plan 2024-2027	Description of completed project	Description of company transition progress			

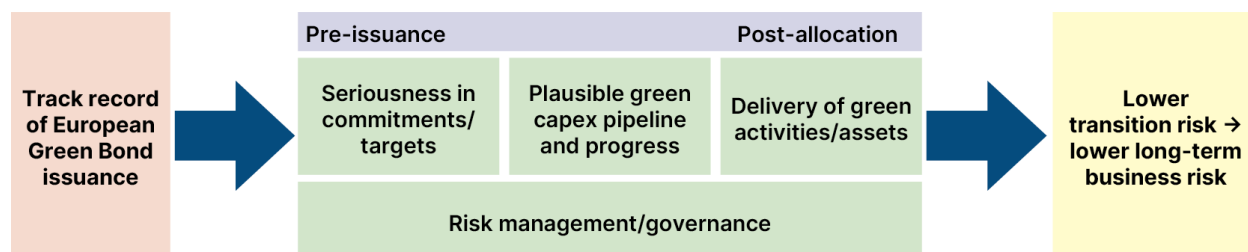
Expected full allocation into taxonomy-aligned capex over 2024-2027 (%)	Total taxonomy-aligned capex plan 2024-2027	Actual taxonomy-aligned allocations (%)	Actual taxonomy-aligned capex (€)	Taxonomy-aligned capex attributed to issue (€/%)	-	Taxonomy-aligned capex (€/%)
Estimated installed renewable capacity by 2027 attributed to issue (GW)	Renewable capacity additions target by 2027 (GW)	Actual installed renewable capacity attributed to issue (GW)	Actual renewable capacity additions between 2024 and 2027 (GW)	Installed renewable capacity attributed to issue (GW)	-	Total installed renewable capacity (GW/%)
Estimated annual renewable production from 2027 onwards attributed to issue (GWh)	Renewable production target beyond 2027 (GWh)	Annual renewable production attributed to issue (GWh)	Renewable production beyond 2027 (GWh)	-	Renewable production attributed to issue (GWh) or (%)	Total renewable production (GWh)
Estimated revenue from renewable production from 2027 onwards attributed to issue (€)	Renewable energy business plan/revenue guidance (€); taxonomy-aligned revenue targets (€/%)	Revenue from the new projects (€)	Taxonomy-aligned revenue or revenue from renewables beyond 2027 (€/%)	-	Taxonomy-aligned revenue attributed to issue (€/%)	Overall taxonomy-aligned revenue (€/%)

Source: IEEFA.

Tendency to Show a High Green Bond Standard Indicates Leading Environment Performance

Figure 9 looks at how the EuGB²³ label can potentially translate into a better management of environmental or transition risk and opportunities under four pillars.

Figure 9: Four Pillars of How a Track Record of European Green Bond Issuance Can Translate Into Lower Transition Risks

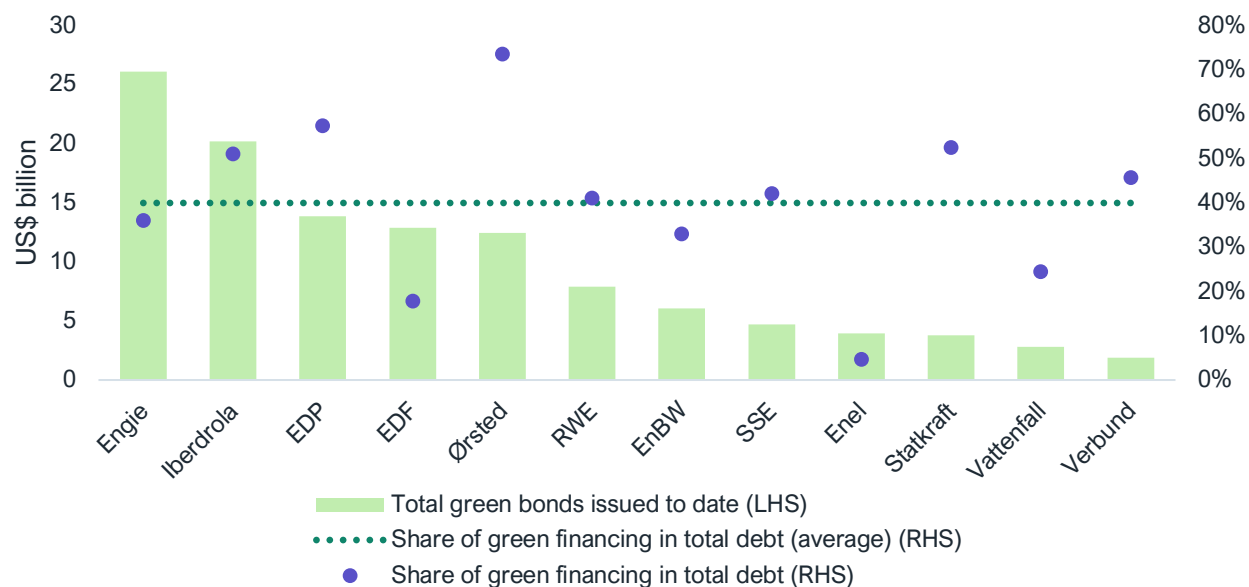


Source: IEEFA.

The absolute size of green bond issuance may not necessarily reflect its high significance in the company's capital structure. Engie, despite being the largest green bond issuer in this study, has green bonds accounting for a minority share of its total debt. A company's energy transition progress can be constrained if it continues to invest in fossil fuels or has owned significant fossil fuel assets backed by conventional financing. IEEFA believes a proven green bond track record is reflected in a meaningful share in the company's capital structure supported with high coherence with the company's transition plan.

²³ IEEFA. [Will Europe's new standard help or hinder green bond market growth?](#) 19 February 2024.

Figure 10: The Extent the Utilities Adopt Use-of-Proceeds Green Financing as a Debt Funding Channel Varies



Source: Company information, Environmental Finance Data, IEEFA.

Notes:

- Total green bonds issued to date are based on Environmental Finance Data, accessed on 6 June 2024.
- Share of green financing includes use-of-proceeds green bonds and loans as of 31 December 2023 (as of 31 March 2024 for SSE). This excludes general purpose sustainable debt labels such as SLBs. Enel, for example, is a prominent SLB issuer; EnBW secured non-labelled loans that the company stated to use for wind projects.
- Total debt represents a company's reported financial debts, excluding lease liabilities or financial liabilities listed in the equity account as of 31 December 2023 (as of 31 March 2024 for SSE). For example, all of Ørsted's hybrids listed in the equity account are labelled green: The share of green financing would be higher adjusting for hybrids' equity credit.

Ørsted has issued only green bonds since 2017 and has outstanding green bonds accounting for a large majority of its debt. This is coupled with its high likelihood of aligning with the EUGBS. This demonstrates coherence between its financing strategy and its transition to environmentally sustainable activities—the company reported that 99% of its capex is taxonomy-aligned in 2023. Despite recently abandoning some U.S. offshore wind projects²⁴ amid supply chain bottlenecks and the cost inflationary environment, Ørsted's track record of project completion has positioned itself favourably in the long-term transition, as reflected by its 86% taxonomy-aligned revenue generation in 2023 (see [next section](#)).

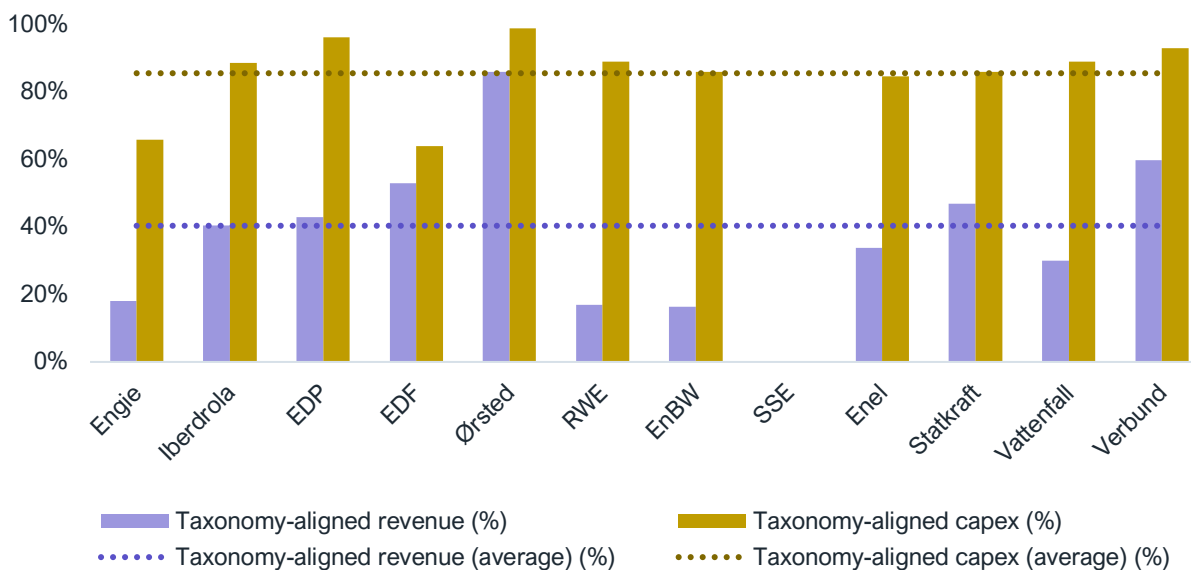
Enel yields the lowest share of green financing among the 12 utilities, but it is an outlier. It instead turned to SLBs,²⁵ accounting for 64% of its total debt as of end-2023, which are not included in the share shown in Figure 10. The company's renewable and electric grid projects could have positioned it among the largest green bond issuers, but it chose to focus on demonstrating its overall strategy via SLBs instead. Enel is a pioneer in the SLB market and is the world's largest SLB issuer.

Enel has relevant, comprehensive company-level targets including emission intensity, renewable capacity and taxonomy-aligned capex ratios: In its 2024-2026 strategy, the utility maps out a total gross investment plan of about €35.8 billion. Its 80% taxonomy-aligned capex target (with proceeds primarily going to renewable generation and grids) indicates €28.4 billion being potentially EUGBS-ready. Enel is well-positioned to issue combined use-of-proceeds sustainability-linked instruments adopting the EUGBS.

²⁴ Ørsted. [Ørsted ceases development of its US offshore wind projects Ocean Wind 1 and 2, takes final investment decision on Revolution Wind, and recognises DKK 28.4 billion impairments](#). 31 October 2023.

²⁵ IEEFA. [Takeaways from Enel's sustainability-linked bonds performance targets](#). 25 March 2024.

Figure 11: Some Advanced Utilities Show Meaningful Environmental Sustainable Capex Pipelines and Operational Activities Fuelled By Successful Green Financing



Source: Company information, IEEFA.

Note: Data as of 31 December 2023; SSE doesn't report on its taxonomy-aligned metrics.

Ørsted, Iberdrola, EDP and Statkraft are among the utilities that show above-average taxonomy-aligned capex and revenue—indicating credible capex pipelines and successful green asset delivery, respectively—supported by a series of green bond issuances with demonstrated impacts and high readiness to adopt the EuGB label. The EUGBS's required enhanced disclosure of the proceeds' expected contribution to environmental strategy could further help showcase the green bonds' coherence with the companies' renewable developments and decarbonisation plans (see Table 2). This generally contrasts with issuers lacking a track record of green bonds backed by a well-defined framework, often accompanied by limited transition planning. For example, Czech energy group EPH entered green financing this year; however, IEEFA notes that the issuance shows very limited coherence with its group-wide transition plan and that the bond proceeds seem unlikely to meaningfully contribute to the decarbonisation of its power generation business.²⁶

Ørsted, Iberdrola, EDP and Statkraft stand out in terms of their progress towards net-zero emissions, either through their commitment to emissions reduction, strong ambition to develop renewables as the majority of their fleet, commitment to a full fossil fuel exit or all of the above.

For each of them, IEEFA analysed the current share of renewables in the power mix, the emission reduction target, sustainable development goals and fossil fuel exit strategy.

This selection is by no means exhaustive (other utilities could fit the progressiveness criteria chosen), nor does it imply that these four utilities have no corrections or improvements to make towards their clean energy transition path.

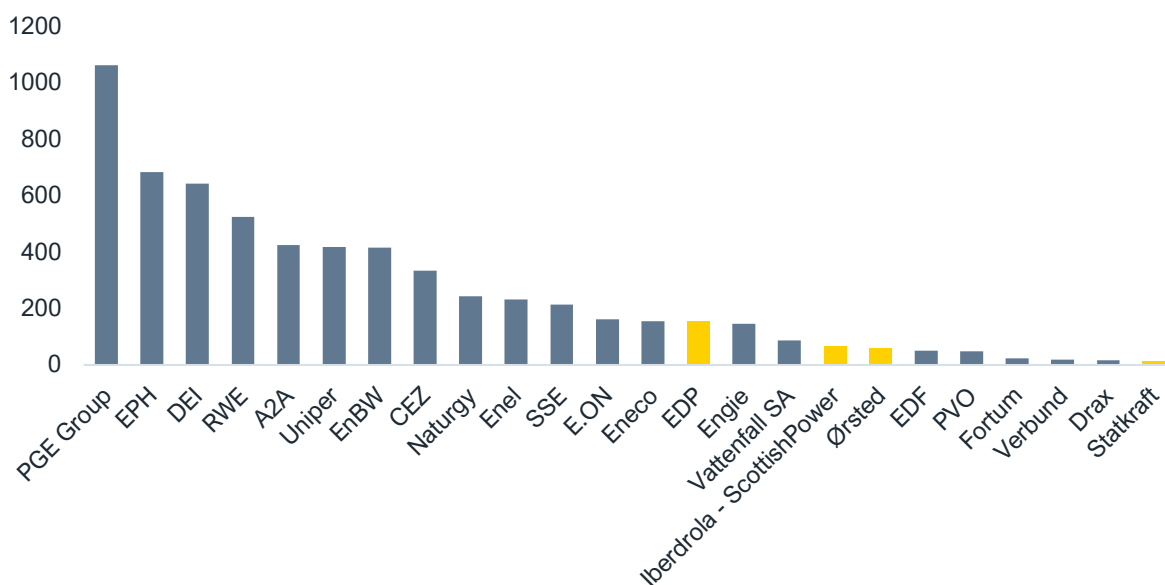
²⁶ IEEFA, [EPH's new green bond issuance reveals flaws in transition plan](#), 3 June 2024.

Statkraft: A Hydropower Giant

Statkraft can be considered a progressive utility in terms of energy transition. As a leading renewable energy company in Europe, Statkraft focuses on hydropower, wind, solar and other renewable energy sources. The company has been actively engaged in transitioning away from fossil fuels towards cleaner, more sustainable energy sources. Statkraft is known for its investments in green technologies and its commitment to reducing carbon emissions.

<p>Actions to achieve net-zero emissions by 2050</p>	<ol style="list-style-type: none"> 1. Investing in renewable energy sources such as hydropower, wind and solar. 2. Implementing energy efficiency measures to reduce emissions from operations. 3. Engaging in partnerships and collaborations to promote sustainable practices in the energy sector. 4. Setting ambitious targets to reduce its carbon footprint and track progress towards net-zero emissions. 5. Supporting research and innovation in clean energy technologies. 										
<p>Power capacity mix</p>	<p>Figure 12: Statkraft Power Capacity Mix by Technology</p> <table border="1"> <caption>Statkraft Power Capacity Mix by Technology</caption> <thead> <tr> <th>Technology</th> <th>Percentage</th> </tr> </thead> <tbody> <tr> <td>Hydropower</td> <td>75%</td> </tr> <tr> <td>Gas</td> <td>13%</td> </tr> <tr> <td>Wind power</td> <td>11%</td> </tr> <tr> <td>Biomass and solar</td> <td>1%</td> </tr> </tbody> </table> <p>Source: Statkraft annual report 2023.</p> <p>Figure 12 shows that renewables represent 87% of Statkraft’s generation mix. The only thermal part of the mix is linked to four combined cycle gas turbine (CCGT) plants in Germany to be decommissioned by 2040.</p> <p>Statkraft’s predominant generation technology is hydropower, inherited from Norway’s more than 100-year experience in building and operating dams.</p>	Technology	Percentage	Hydropower	75%	Gas	13%	Wind power	11%	Biomass and solar	1%
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	<p>However, in the last two decades, Statkraft has developed its renewable mix beyond hydro, into wind, solar and biomass.</p> <p>Statkraft's generation assets are mostly in Norway but also in other European countries such as Sweden, Germany, the UK, Spain and Albania. It is also present in Peru, Chile, Brazil, India and Nepal.</p> <p>It operated more than 2GW of hydro and solar in Central America, Africa and Southeast Asia through its subsidiary SN Power, which was recently divested to another Norwegian firm, Scatec Solar.</p>										
Emissions reductions goals	<p>Statkraft's emissions targets will follow a 1.5-degree pathway for the power sector. 100% of its investments will be in renewable energy, and the goal is to reach carbon neutrality for Scope 1 and 2 by 2040 and net-zero emissions (Scope 1 to 3) by 2050.</p> <p>Carbon Intensity Goal for Power Generation</p> <table border="1"> <thead> <tr> <th>Year</th> <th>Target (CO₂ g/KWH)</th> </tr> </thead> <tbody> <tr> <td>2025</td> <td><50</td> </tr> <tr> <td>2030</td> <td><35</td> </tr> <tr> <td>2040</td> <td>Carbon neutral</td> </tr> <tr> <td>2050</td> <td>Net zero</td> </tr> </tbody> </table> <p>Note: Carbon neutral covers Scope 1 and 2 emissions; net-zero emissions covers Scopes 1 to 3.</p>	Year	Target (CO ₂ g/KWH)	2025	<50	2030	<35	2040	Carbon neutral	2050	Net zero
Year	Target (CO ₂ g/KWH)										
2025	<50										
2030	<35										
2040	Carbon neutral										
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Sustainable power development	<p>Statkraft's sustainable development goals are to continue the build-up of solar, onshore wind and battery storage, targeting an annual delivery of 2.5-3GW by 2025 and 4GW by 2030.</p> <p>In 2022, Statkraft invested NOK 11.5 billion (about €1 billion), mostly on renewables. 44% of its investments were in Europe.</p>										
Fossil fuel exit	<p>Statkraft has no capacity for producing or using petroleum products or coal for power generation. Its 1.6GW of operational gas-fired power generation in Germany is planned to be decommissioned (or retrofitted with carbon capture and storage technology to reduce emissions) by 2040.</p>										

Figure 13: European Power Utilities' Average CO₂ Emission Factor (kg/MWh), 2022 Data

Source: PwC. *Climate Change and Electricity: European Carbon Factor Benchmarking of CO₂ emissions by Europe's largest electricity utilities. December 2023. (2022 data).*

A 2023 study by PwC assessed that Statkraft's emission factor in 2022 was the lowest among Europe's largest electricity utilities, with 11 kilograms (kg) of CO₂ emitted per megawatt-hour (MWh) (Scope 1).

Ørsted: World Leader in Offshore Wind

Danish renewable energy company Ørsted (named after the Danish scientist Hans Christian Ørsted) was founded in 2006 as DONG Energy (short for Danish Oil and Natural Gas). It started as a government-owned company focused on oil and natural gas exploration and production. Over the years, Ørsted has transitioned to renewable energy, becoming a global leader in offshore wind (though most of its former oil and gas assets have been divested rather than shut down)²⁷. The company has been instrumental in driving the transition to green energy and sustainability practices.

Ørsted can therefore be considered a progressive utility in terms of energy transition. It might be one of the best examples (if not unique) of a company planning to switch fully from fossil fuels to renewables: From an oil and gas exploration entity, it reshuffled its business entirely to become a leading renewable developer and pioneer in offshore wind farms in the open seas. It has been recognised for its efforts in transitioning towards cleaner energy sources and reducing its carbon footprint.

²⁷ Financial Times. [Dong Energy sells oil and gas business to Ineos. 24 May 2017.](#)

<p>Actions to achieve net-zero emissions by 2040</p>	<ol style="list-style-type: none"> 1. Investing in renewable energy such as offshore wind farms and bioenergy plants to reduce reliance on fossil fuels. 2. Developing innovative technologies to improve energy efficiency and decrease carbon emissions. 3. Collaborating with partners and stakeholders to drive sustainable energy solutions. 4. Setting ambitious sustainability goals, including becoming carbon neutral by 2025. 5. Engaging in research and development to improve its sustainable energy practices. 6. Promoting awareness and education about the benefits of green energy and the importance of transitioning to renewable sources. 										
<p>Power capacity mix</p>	<p>Figure 14: Ørsted Power Capacity Mix by Technology</p> <table border="1"> <caption>Data for Figure 14: Ørsted Power Capacity Mix by Technology</caption> <thead> <tr> <th>Technology</th> <th>Percentage</th> </tr> </thead> <tbody> <tr> <td>Offshore wind</td> <td>56%</td> </tr> <tr> <td>Onshore wind</td> <td>22%</td> </tr> <tr> <td>Thermal (oil, gas, coal, biomass)</td> <td>16%</td> </tr> <tr> <td>Solar</td> <td>6%</td> </tr> </tbody> </table> <p>Source: Ørsted half-year report, June 2023.</p> <p>Figure 14 shows that 84% of Ørsted’s installed capacity is renewables and the vast majority is (offshore) wind. Ørsted also plans to develop further biomass generation. The 16% remaining power generated by thermal fuels is the legacy from DONG assets. These include coal, oil and gas turbines in Denmark slated for decommissioning by 2030 and 1.2GW of biomass to be kept in the fleet.</p> <p>Ørsted is the world’s largest offshore wind developer. It started with projects in the shallow North and Baltic seas bordering Denmark but has since expanded to most of northwestern Europe including the UK, Germany, Netherlands and Ireland.</p>	Technology	Percentage	Offshore wind	56%	Onshore wind	22%	Thermal (oil, gas, coal, biomass)	16%	Solar	6%
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Emissions reductions goals	<p>Ørsted's carbon emissions goals are aligned with the following policy agendas:</p> <ul style="list-style-type: none"> • Limiting global heating to 1.5°C as per the Paris Agreement. • Supporting the expansion of renewables and the phase-out of fossil fuels. <p>Carbon Intensity Goal for Power Generation</p> <table border="1" data-bbox="414 556 1084 877"> <thead> <tr> <th>Year</th> <th>Target</th> </tr> </thead> <tbody> <tr> <td>2025</td> <td>98% Scope 1 and 2 carbon emissions reductions, compared with 1990</td> </tr> <tr> <td>2030</td> <td>All newly commissioned renewable energy projects must have a net positive biodiversity impact</td> </tr> <tr> <td>2040</td> <td>Net zero for the full value chain</td> </tr> </tbody> </table> <p>A PwC study ranked Ørsted as the seventh-lowest carbon emitter among Europe's largest power utilities in 2022, with 60kg of CO₂/MWh produced (Scope 1) (see Figure 13).</p>	Year	Target	2025	98% Scope 1 and 2 carbon emissions reductions, compared with 1990	2030	All newly commissioned renewable energy projects must have a net positive biodiversity impact	2040	Net zero for the full value chain
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2025	98% Scope 1 and 2 carbon emissions reductions, compared with 1990								
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Sustainable power development	<p>The stated ambition is to grow the renewable portfolio's capacity from 15.7GW in 2023 to 35-38GW by 2030 (including up to 20-22GW of offshore wind and up to 11-13GW of onshore wind), with an intermediate goal of 23GW by 2026. The company plans to spend DKK 270 billion (about €36 billion) by 2030 to reach these targets.</p>								
Fossil fuel exit	<p>1.5GW of DONG legacy thermal generation capacity is to be decommissioned by 2030.²⁸</p>								

²⁸ Enerdata.

Iberdrola: Shift From a Conventional Utility to a Global Renewable Leader

Iberdrola was founded in 1992 through a merger of two Spanish state-owned utilities. It has grown to become one of the world’s largest electric utility companies, with a strong focus on renewable energy. Iberdrola has expanded internationally, with a presence in various countries across Europe, the Americas, Asia and Africa. It has a track record of innovation and sustainability, aiming to lead the transition to a low-carbon economy.

<p>Actions to achieve net-zero emissions by 2040</p>	<p>Iberdrola has made significant investments in renewable energy sources such as wind, hydroelectric and solar power in the last two decades. It has committed to reducing emissions and promoting sustainability in its operations. These efforts have positioned the company as a progressive power utility in the energy transition space.</p> <p>Iberdrola has phased out coal-fired power plants. It has been actively involved in developing new technologies and solutions for energy storage and smart grids to support the transition to clean energy.</p>																
<p>Power capacity mix</p>	<p>Figure 15: Iberdrola Power Capacity Mix by Technology</p> <table border="1"> <thead> <tr> <th>Technology</th> <th>Percentage</th> </tr> </thead> <tbody> <tr> <td>Onshore wind</td> <td>38%</td> </tr> <tr> <td>Hydropower</td> <td>24%</td> </tr> <tr> <td>Solar</td> <td>11%</td> </tr> <tr> <td>CCGT (gas)</td> <td>15%</td> </tr> <tr> <td>Nuclear</td> <td>6%</td> </tr> <tr> <td>Offshore wind</td> <td>3%</td> </tr> <tr> <td>Mini hydro</td> <td>1%</td> </tr> </tbody> </table> <p>Source: Iberdrola. <i>Results Presentation First Quarter 2024</i>. 24 April 2024.</p>	Technology	Percentage	Onshore wind	38%	Hydropower	24%	Solar	11%	CCGT (gas)	15%	Nuclear	6%	Offshore wind	3%	Mini hydro	1%
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Year	Target								
2025	<70gCO ₂ /kWh								
2030	Carbon neutral in Scopes 1 and 2								
2040	Carbon neutral (net-zero emissions) in Scopes 1, 2 and 3								
<p>Sustainable power development</p>	<p>Iberdrola is committed to investing €41 billion between 2024-2026 to drive the energy transition, boost employment and make progress towards net-zero emissions.</p> <p>The company aims to have 52GW of renewable capacity globally in 2025 and 80GW in 2030.</p>								
<p>Fossil fuel exit</p>	<p>Iberdrola has phased out coal from its fleet but does not have an explicit exit strategy for its gas-fired generation assets.</p>								

EDP: Targeting 100% Renewables by 2030

EDP was founded in 1976 and is headquartered in Lisbon, Portugal. It is one of the largest energy companies in Europe, operating in the generation, distribution and commercialisation of electricity, gas and renewable energy.

Over the years, EDP has expanded its operations internationally, particularly in Spain, the U.S. and Brazil. The company has been actively involved in renewables projects, aiming to increase the share of clean energy sources in its energy portfolio. It has also been a pioneer in developing innovative solutions for energy efficiency and sustainability.

<p>Actions to achieve net-zero emissions by 2040</p>	<ol style="list-style-type: none"> 1. Investing in renewable energy sources such as wind, solar and hydroelectric power to reduce carbon emissions and promote sustainability. 2. Developing energy storage solutions to better integrate renewable energy into the grid and improve overall grid flexibility. 3. Implementing energy efficiency initiatives to reduce energy consumption and promote responsible energy usage. 4. Investing in smart grid technologies to modernise the electric grid and improve overall energy distribution. 5. Promoting electric vehicles and charging infrastructure to reduce reliance on fossil fuels. 												
<p>Power capacity mix</p>	<p>Figure 16: EDP Power Capacity Mix by Technology</p> <table border="1"> <caption>EDP Power Capacity Mix by Technology</caption> <thead> <tr> <th>Technology</th> <th>Percentage</th> </tr> </thead> <tbody> <tr> <td>Wind</td> <td>48%</td> </tr> <tr> <td>Hydropower</td> <td>26%</td> </tr> <tr> <td>Solar</td> <td>12%</td> </tr> <tr> <td>Gas</td> <td>11%</td> </tr> <tr> <td>Coal</td> <td>3%</td> </tr> </tbody> </table> <p>Source: EDP annual report 2023.</p>	Technology	Percentage	Wind	48%	Hydropower	26%	Solar	12%	Gas	11%	Coal	3%
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	Net-zero emissions (Scope 1, 2 and 3)								
Sustainable power development	<p>EDP's midterm target is to increase renewable capacity by 4.5GW a year between 2023 and 2026. This would see its 2026 wind and solar capacity be double that of 2020. Over the 2023-2026 period, the company plans to add 18GW of renewables, including 5GW of onshore wind, 9.4GW of solar photovoltaics, 0.7GW of offshore wind and 0.5GW of hydrogen plus storage.</p> <p>With this planned capacity growth, EDP aims to reach net-zero emissions by 2040. It plans a €21 billion financial commitment over 2023-26 to sustain this goal. These investments are earmarked for Europe, North and South America, and Asia Pacific.</p>								
Fossil fuel exit	<p>EDP's current capacity mix is about 86% renewable, the goal being to reach 100% by 2030.</p> <p>Oil and coal are to be phased out by 2025 and gas by 2030.</p>								

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The Institute for Energy Economics and Financial Analysis (IEEFA) examines issues related to energy markets, trends and policies. The Institute's mission is to accelerate the transition to a diverse, sustainable and profitable energy economy. www.ieefa.org

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