TenneT
Taking power further

Green Finance
Report 2017

Green Finance Report 2017

For the past three years, TenneT has taken an active role in the green finance market. In 2017, we were the first company to issue a Green Hybrid Bond, a financial instrument that combines debt and equity characteristics. We currently have EUR 5 billion in outstanding green financing instruments. This was also the year in which we continued to attract external recognition from the financial market for our ongoing commitment to green financing instruments and the further development of the green financing market.

Our leading role in this field was rewarded at the Sustainable & Responsible Capital Markets Forum held by GlobalCapital in September, where TenneT won awards for 'Most Impressive Green Bond Issuer' and 'Overall Most Impressive Corporate Green Bond Issuer'. This recognition underlines that the green financing route that we chose three years ago is valued by the financial markets.

Connecting society to sustainable energy sources is our daily business. Green financing perfectly aligns with this task. Our purpose is to ensure that essential high-voltage infrastructure (approximately 22,500 km of grid in its current form) is developed and managed efficiently, throughout the Netherlands and large parts of Germany. Green financing instruments are an important tool for financing projects with clear environmental benefits - such as connecting renewable energy infrastructure. This is particularly valuable as our industry faces the challenge of financing the shift to renewable energy – the 'energy transition'. We believe green financing instruments are a perfect way to fund these expenditures. Moreover, they pose an attractive and sustainable investment opportunity.
In this 2017 edition of the TenneT Green Finance Report, we track the progress of our projects funded by green financing.

We use the proceeds from our green financing initiatives to invest in connections linking offshore wind farms to the onshore electricity grid. The proceeds of our green debt issues are specifically dedicated to a portfolio of projects connecting wind farms in the German part of the North Sea to the German onshore grid: DolWin1, DolWin2, Dolwin3, BorWin1, BorWin2, BorWin3, HelWin1 and SylWin1. The projects BorWin1, BorWin2 and HelWin1, were added during 2017 to the portfolio.

All projects meet the requirements as Eligible Projects under our Green Bond Framework and are essential to facilitating the transition to renewable energy. Further independent assurance of the sustainable quality of our green financing has been issued by oekom research AG, a leading rating agency in the field of sustainability. This applied to our green financing issued in 2015, 2016 and 2017. oekom also provided an overall CSR rating for our company of B (status Prime) in the network operators category.

This annual report describes the performance of the projects linked to our green debt portfolio. The report was reviewed by EY. Their accompanying assurance report can be found on page 11.

As a company that constantly needs to prepare for the future, we expect that the CO_2 reduction targets set in the Paris Climate Agreement will demand such a high level of renewable energy production capacity that countries will struggle to cope on an individual basis. Our far reaching vision, a North Sea Wind Power Hub, announced in 2016, could play an important role in meeting these challenges. The vision involves a way of connecting bordering North Sea countries to approx. 70 – 100 GW of wind power, supplying renewable energy to 80 million people in Europe by 2050.
For more information, please **visit the website.**

Our sustainable way of financing

Our use of green financing is a logical step for us as we work to connect society to a sustainable and reliable supply of electricity. As part of a global effort to build a more sustainable future. This ambition is outlined in detail in the recently launched Sustainable Development Goals (SDGs) of the United Nations.

We recognise that we have a role to play in the realisation of this vision and have therefore selected, together with our stakeholders, the SDGs that are closest to our business. In our offshore operations we see our contribution as follows:

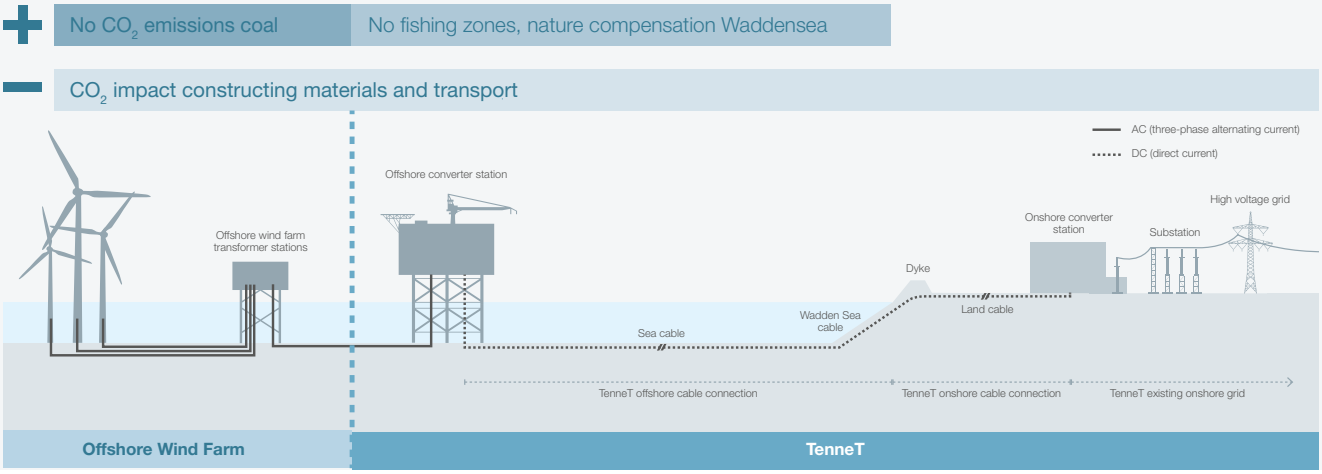
SDG	
	This is a goal where TenneT plays a crucial role. As a leading European TSO, we embrace the challenge of integrating sustainable and modern energy without compromising the reliability of supply. In doing so, we take societal costs into account and support the development of lower prices by installing cross-border capacity.
	Being a central player in the energy transition, with an investment portfolio of approx. EUR 28 billion in the next ten years, we create economic growth in the countries where we operate and procure goods and services. We purchase components, hire contractors and challenge the industry to come up with better solutions to make our grid more efficient and future-proof.
	Our innovation objective is: “the successful exploitation of new ideas to create value for the company and society”. If we succeed, society will benefit directly, and this in turn will have a significant impact on industry and economic welfare. Doing this in close cooperation with our stakeholders makes our embedded solutions sustainable in the long run.
	To achieve national and European targets for reducing CO_2 emissions, a significant amount of electricity must come from renewable sources, including solar and wind. A sustainable and stable energy system of the future requires both sun and wind energy, generated and delivered on a large scale. Helping to realise this sustainable and stable energy system is our contribution to reaching the world’s ambition on climate action.

Our total long-term green financing has grown from EUR 1 billion in 2015, to 3 billion in 2016 and to EUR 5 billion in 2017. This makes TenneT a top-3 player in green financing in Europe.

The increase was achieved by three different issues, starting in April with the issue of a EUR 1 billion Green Hybrid Bond. In June, we issued two tranches of EUR 500 million, one with a duration of 8 years and another with 12 years.

In 2017, on the occasion of the Paris 2017 Climate Finance Day, we joined together with eight of Europe’s largest industrial issuers of green bonds (EDF, Enel, ENGIE, Iberdrola, Icade, Paprec, SNCF Réseau and SSE) in a public pledge to further develop the green bond market. Together, the signatories called upon other industrial companies to consider issuing green bonds, which will further strengthen this market and enhance its attractiveness for the growing number of climate-minded investors.

Impact of offshore wind electricity on nature



Our projects and our impact

The projects highlighted in this report are part of an ambitious programme to provide grid connections to offshore wind farms located off the coast of Germany, in the German Bight. This is a crucial part of the German Energiewende – the transition to a low-carbon, environmentally sound, reliable, and affordable energy supply. Harnessing offshore wind power, transporting it ashore with subsea cables and connecting it to the grid (by onshore underground cables) are an important part of this transition. The process works by converting alternating current electricity generated by offshore wind turbines into direct current electricity on the offshore converter platform. Direct current is converted back into alternating current to be fed into the grid at the onshore converter station/feed-in point. The use of high-voltage-direct-current (HVDC) supports the sustainability two fold as it has less transmission losses and a reduced number of cables crossing the sensitive waddensea coastline, compared with conventional alternating current (AC) technology.
Our current indication is that all eight projects will be operational in 2019. At that point in time, TenneT's investments – backed by green financing – will have the capacity to connect 6.2 GW of sustainable wind power to the German grid.

The aim of these projects is to have a positive climate impact. However, from an environmental perspective, the impact goes beyond climate alone. This is why we have started to utilise the Natural Capital Protocol (NCP). This protocol was launched to provide businesses with a framework for dealing with environmental dependencies and impacts. We believe this methodology provides a broad view on the entire environmental impact of our work and therefore we applied it to one of our projects, DolWin2, in more detail.

The outcome of this assessment shows that the positive impacts are the reduced CO_2 emissions and the creation of a no-fishing zone, which was established as a safety precaution around our offshore platform. There are additional positive impacts from the nature compensation measures we undertook on Norderney island.
The negative dependencies are related to the large amount of materials required to build and maintain the electricity grid. These materials are largely composed of materials such as copper and aluminium – both non-renewable materials – and the CO_2-footprint created by mining these materials. The possible leakage of SF_6 gas (which we use in our operation) and CO_2 emissions from transport also have an impact.
On balance, we concluded that the reduced CO_2 impact is dominating, however other impacts play a role as well.

At the end of 2017, the following eight projects were included in our green project portfolio and were funded through green financing, including green bonds:

	DolWin1	DolWin2	DolWin3	BorWin3	SylWin1	BorWin2	BorWin1[1]	HelWin1
Offshore converter platform	High voltage direct current transmission cable connecting offshore wind power clusters in the German Bight with the German electricity grid. Alternating current from wind power plants is converted into direct current on the offshore converter platform. Direct current is converted back into alternating current to be fed into the grid at the onshore converter station/ feed-in point.							
Offshore converter platform	DolWin alpha	DolWin beta	DolWin gamma	BorWin gamma	SylWin alpha	BorWin beta	BorWin alpha	HelWin alpha
Onshore converter station/ Feed-in point	Dörpen West, Germany	Dörpen West, Germany	Dörpen West, Germany	Emden Ost, Germany	Büttel, Germany	Diele, Germany	Diele, Germany	Büttel, Germany
Transmis-sion power	800 MW	916 MW	900 MW	900 MW	864 MW	800 MW	400 MW	576 MW
Cable length Total (submarine; onshore)	165 km (75 km; 90 km)	135 km (45 km; 90 km)	160 km (80 km; 80 km)	160 km (130 km; 30 km)	205 km (160 km; 45 km)	200 km (125 km; 75 km)	200 km (125 km; 75 km)	130 km (85 km; 45 km)
Start of construction	2011	2012	2014	2015	2012	2010	2008	2011
Start of operation	2015	2016[2]	2018	2019	2015	2015	2010	2015
Added to green project portfolio in	May 2015	May 2015	May 2015	May 2016	September 2016	March 2017	June 2017	June 2017

[1] The construction of BorWin1 started before TenneT acquired transpower, part of E.ON (currently TenneT Germany).

[2] Initial date for being operational, connection was put back into operation again on 8 January 2017.

More information on our offshore projects can be found on **our website**.

Our performance

Indicators relevant to our yearly reporting are laid out in the **Green Bond Framework**. The results over 2017 for each of these indicators can be found in the tables on the following pages.

We can report there were no significant controversies in 2017. Impact on our operations due to technical issues are reported in the advancement of projects paragraph.

Advancement of proceeds and projects

As of 31 December 2017, the total spent by TenneT on the eight projects amounted to approximately EUR 7.3 billion, of which about EUR 1.3 billion was financed by third parties (through both debt and equity). Therefore, the net funding requirement was about EUR 6.0 billion, of which EUR 5.0 billion was financed through the green financing programme in 2015 to 2017.

As a result, all green financing issued has already been used as financing, refinancing and/or investing in the eight projects. An overview of this calculation:

Total budget project portfolio	EUR 8.5bn
Total spent on project portfolio	EUR 7.3bn
Third-party financing (debt and equity)	EUR 1.3bn -/-
Net funding requirement green debt	EUR 6.0bn

Of which 5 billion already has been financed via green financing:

Funded by green financing in 2015	EUR 1.0bn
Funded by green financing in 2016	EUR 2.0bn
Funded by green financing in 2017	EUR 2.0bn

(figures as per 31 December 2017)

During 2017 the DolWin3 construction project had to be delayed, due to control software issues. This does not yet have an effect on the planned operation in 2018. At our DolWin1 connection we encountered a cable failure in the last calendar week of 2017, leading to having one offshore windfarm of 200 MW temporary out of service. A repair campaign has been planned in close cooperation with the cable manufacturer. The connection is expected to be back into operation at the end of February 2018.

Environmental and social impact indicators

The total environmental and social impact of the projects in the project portfolio in 2017 is described on the following pages.

Transport and availability

In 2017, the six operational projects transmitted 14,161 GWh of renewable electricity. Thanks to HVDC technology, grid losses are relatively low. The grid losses and the availability of the six projects are detailed below.

	DolWin1	DolWin2	DolWin3	BorWin3	SylWin1	BorWin2	BorWin1	HelWin1	Total
Transported electricity (GWh)	1750	2429	-	-	3633	2695	1498	2155	14161
Grid losses (GWh)	61	76	-	-	147	110	102	82	579
Grid losses (%)	3,5%	3,1%	-	-	4,1%	4,1%	6,8%	3,8%	4,1

	DolWin1	DolWin2	DolWin3	BorWin3	SylWin1	BorWin2	BorWin1	HelWin1	Total
Grid availability (%)	97.1%	96.5%	-	-	97.6%	98.4%	98.1%	99.4%	97.8%
Average interruption (hours)	254	305	-	-	206	144	162	55	196

Impact on households

The ultimate objective of building wind farms offshore, and the cables and lines needed to transport the electricity, is to bring renewable energy to consumers. Although in Germany most of the electricity is used by industry, we report the impact on households, since this allows readers to easier interpret the impact.
The total number of households whose electricity consumption could theoretically be fully provided by the renewable electricity actually transported in 2017 is around 4.6 million, which is around 11% of all German households.

Equivalent number of households benefitting from access to wind power (based on actual transported capacity in 2017 x 1000):

DolWin1	DolWin2	DolWin3	BorWin3	SylWin1	BorWin2	BorWin1	HelWin1	Total
570	790	-	-	1180	880	490	700	4,600

Figures are rounded off at 10,000 household and the calculation is based on the average electricity consumption of a German household.

Avoided CO_2 emissions[3]

The CO_2 impact of electricity produced by wind farms is significantly lower compared to electricity produced by fossil-based power plants.

Potential avoidance of CO_2 emissions (based on actual operational capacity in 2017, in millions of tonnes):

DolWin1	DolWin2	DolWin3	BorWin3	SylWin1	BorWin2	BorWin1	HelWin1	Total
0.92	1.28	-	-	1.91	1.42	0.79	1.14	7.46

[3] *We have changed our carbon emission conversion factor from comparison with a coal plant to the average carbon impact of the German grid which is 527 g/kWh, compared to 809 g/kWh. This because benchmarking showed that more and more companies and institutions are applying this factor.*

In 2017, we achieved 57% of the maximum potential of avoided CO_2 emissions, because not all connections are in operation yet, weather conditions determine the amount of generated electricity and not yet the full capacity of all connections is used. To calculate the amount of CO_2 avoided by any particular bond in 2017, please consult the appendix, which includes instructions for calculations.

Safety

We believe that every incident is one too many. In our **Safety Vision**, we describe our safety ambitions and targets. Tragically, we had to face a third party fatal incident in 2017 on a shipyard where the BorWin3 platform is being constructed. TenneT has been deeply affected by this fatal incident. To prevent similar incidents from happening, we are working hard on improving our safety leadership. In particular, we do this by raising safety awareness among all our managers and employees, whether directly employed by us or not.

In 2017, the reported safety performance of our projects shows that we had just one lost work day case at our BorWin3 project, which is a project still under construction.

	DolWin1	DolWin2	DolWin3	BorWin3	SylWin1	BorWin2	BorWin1	HelWin1	Total
Lost workday cases (LWC)	0	0	0	1	0	0	0	0	1
LTIF (LWC/million hours worked)	0	0	0	2.1	0	0	0	0	0.4

Environment

Sulphur hexafluoride (SF_6) is used in high-voltage equipment, because it is an excellent electrical insulator. However, involuntary SF_6 leakage contributes significantly to greenhouse gas emissions. In 2014, TenneT developed a SF_6 policy, striving to minimise usage and emission of SF_6 in both relative and absolute terms, even as it expands the grid. We aim to reduce our relative SF_6 emissions by 20% in 2020 compared to 2015. On top of this, we have set an absolute target to keep SF_6 leakage until 2020 below the 2015 level. Achieving these targets is particularly challenging for our onshore grid because leakage rates increase with the age of components. Since our offshore assets are still relatively new, leakage rates are close to industry standard. In 2017, our total offshore SF_6 leakage rate was 0%, creating no impact on the environment.

	DolWin1	DolWin2	DolWin3	BorWin3	SylWin1	BorWin2	BorWin1	HelWin1	Total
Kg SF_6 leaked/Kg SF_6 banked	0%	0%	-	-	0%	0%	0%	0%	0%

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** Statutory Director*

Appendix

Avoided potential CO_2 emissions per debt issue

A reduction in CO_2 emissions is key to reaching the ambitious climate targets set at the Paris climate summit in November 2015. Transporting renewable energy from sea to land clearly contributes to achieving these targets. We highlight avoided CO_2 emissions based on the average carbon emissions of the electricity production on the German grid. Although our approach is a theoretical one, we believe this best indicates the magnitude of our green finance portfolio. The calculation is performed in the following way:

- The amount of transported electricity is converted to avoided carbon emissions by the average carbon intensity of the German grid (527 g/KWh) for each project, as shown in the table on page 8. This conversion factor has changed from last year, because we wanted to align with other carbon calculations and make our figures more comparable.
- For each issue, we calculate which proportion of the issue belongs to which project.
- The allocation to each project is divided by the total budget for each project, multiplied by the potential avoided carbon emissions of the actual operational capacity in 2017 of the specific project. The avoided CO_2 emissions depend on whether a connection is in operation or not, if the full capacity is used and the weather conditions.
- For each issue, the projects that were part of the green debt portfolio at that time are taken into account. Adding up the avoided carbon emissions of each project gives the total avoided CO_2 emissions per issue.

The potential avoided CO_2 emissions per debt issue were calculated for 2017. Depending on the size of the investment, the CO_2 emissions per investment can be calculated by:

$$\text{Avoided } CO_2 \text{ emissions related to investment} = \frac{\text{investment size (million)}}{\text{size issue y}} \times \text{avoided } CO_2 \text{ emissions issue y}$$

Date of issue	Type of financing	Size (million EUR)	Avoided CO_2 emissions (tonnes x 1000) in 2017*
June 2015	Green Bond	500	380
June 2015	Green Bond	500	380
May 2016	Green Schuldschein	77	60
May 2016	Green Schuldschein	100	80
May 2016	Green Schuldschein	55	40
May 2016	Green Schuldschein	50	40
May 2016	Green Schuldschein	138	110
May 2016	Green Schuldschein	80	60
June 2016	Green Bond	500	290
June 2016	Green Bond	500	290
October 2016	Green Bond	500	420
April 2017	Green Hybrid	1000	920
June 2017	Green Bond	500	590
June 2017	Green Bond	500	590
Total		**5,000**	**4,250**

** Please be aware that the avoided carbon emissions are realised by the connected wind farms and the transmissions infrastructure. And that the avoided CO_2 emissions are allocated based on the amount of green financing.*

Assurance report of the independent auditor

To: the executive board and the supervisory board of TenneT Holding B.V.

Our conclusion

We have examined the Green Finance Report 2017 (hereinafter: the Report) of TenneT Holding B.V., Arnhem (hereinafter: TenneT). The Report comprises a description of the sustainable performance of the DolWin1, DolWin2, DolWin3, BorWin3, SylWin1, BorWin2, BorWin1 and HelWin1 projects during the reporting year 2017.
Based on our procedures performed and evidence obtained, and with due consideration of the limitations described in the paragraph "Limitations in our scope", nothing has come to our attention that causes us to conclude that the information in the Report of TenneT is not prepared, in all material respects, in accordance with the green bond reporting principles as developed by TenneT as disclosed in "Definitions integrated annual report and green finance report 2017", which are based on the "Green Bond Framework", both disclosed on www.tennet.eu.

Basis for our conclusion

We performed our examination in accordance with Dutch law, including the Dutch Standard 3000A *'Assurance-opdrachten anders dan opdrachten tot controle of beoordeling van historische financiële informatie (attest-opdrachten) (assurance engagements other than audits or reviews of historical financial information (attestation engagements))'.* This engagement is aimed to obtain limited assurance. Our responsibilities in this regard are further described in the 'Our responsibilities for the examination of the Report' section of our report.
We are independent of TenneT in accordance with the 'Verordening inzake de onafhankelijkheid van accountants bij assurance-opdrachten' (ViO, Code of Ethics for Professional Accountants, a regulation with respect to independence) and other relevant independence requirements in The Netherlands.
Furthermore we have complied with the 'Verordening gedrags- en beroepsregels accountants' (VGBA, Dutch Code of Ethics). We believe that the assurance evidence we have obtained is sufficient and appropriate to provide a basis for our conclusion.

Limitations in our scope

The green bond reporting principles, as published in "Definitions integrated annual report and green finance report 2017" on TenneT's website, are integral part of the Report and therefore of our assurance engagement. Other references (to www.tennet.eu, external websites and other documents) are outside the scope of our assurance engagement.

Responsibilities of management for the Report

Management is responsible for the preparation of the report in accordance with the green bond reporting principles as developed by TenneT as disclosed in "Definitions integrated annual report and green finance report 2017", which are based on the "Green Bond Framework", both disclosed on www.tennet.eu. In this context, management is responsible for the identification of the intended users and the criteria being applicable for their purposes. Management is also responsible for such internal control as it determines is necessary to enable the preparation, measurement or evaluation of the Report that are free from material misstatement, whether due to error or fraud.

Our responsibilities for the examination of the Report

Our responsibility is to plan and perform our examination in a manner that allows us to obtain sufficient and appropriate assurance evidence for our conclusion.
The procedures performed in this context consisted primarily of making inquiries with officers of the entity and determining the plausibility of the information included in the Report.
The level of assurance obtained in a limited assurance engagement is substantially lower than the assurance that would have been obtained had a reasonable assurance engagement been performed.

We apply the 'Nadere voorschriften kwaliteitssystemen' (NVKS, Regulations for Quality management systems) and accordingly maintain a comprehensive system of quality control including documented policies and procedures regarding compliance with ethical requirements, professional standards and applicable legal and regulatory requirements.

Our examination included:

- Performing an external environment analysis and obtaining an understanding of the sector, relevant social issues, relevant laws and regulations and the characteristics of the organization.
- Identifying areas of the report where a material misstatement, whether due to errors of fraud, are most likely to occur, designing and performing assurance procedures responsive to these areas, and obtaining assurance information that is sufficient and appropriate to provide a basis for our conclusion.
- Evaluating the appropriateness of the reporting principles and criteria, their consistent application and the reasonableness of accounting estimates made by management.
- Evaluating the design and implementation of the systems and processes for data gathering and processing of information as presented in the Report.
- Interviews with relevant staff responsible for providing the information in the report, carrying out internal control procedures on the data and the consolidation of the data in the report.
- Evaluating internal and external documentation, in addition to interviews, to determine whether theinformation in the report is reliable.

Amsterdam, 20 February 2018

Ernst & Young Accountants LLP
Signed by J. Niewold

Colophon

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Disclaimer

`We´, `TenneT´, `TenneT Holding´, `the Group´, `the company´ or similar expressions are used in this report as a synonym for TenneT Holding B.V. and its subsidiaries.
Parts of this report contain forward-looking information. These parts may include unqualified statements on future operating results, government measures, the impact of other regulatory measures on the activities of TenneT as a whole, TenneT´s shares and those of its subsidiaries and joint-ventures in existing and new markets, industrial and macro-economic trends and TenneT´s performance in these. Such statements are preceded or followed by or contain words such as `believes´, `expects´, `anticipates´ or similar expressions. These forward-looking statements are based on current assumptions concerning future activities and are subject to known and unknown factors, and other uncertainties, many of which are beyond TenneT´s control, so that future actual results may differ significantly from these statements.
All financial information in this integrated annual report is reported in millions of euro, unless stated otherwise. As a result, small rounding differences may occur.

Definitions of the KPIs reported are published on our website
http://www.tennet.eu/company/our-responsibility/download-reports/