

Investor Briefing | May 2023

Impact Report

NRW Sustainability Bond #9

*Impact Reporting of the Sustainability
Bond #9 issued in 2022 by the German
State of North Rhine-Westphalia (NRW)*

This report is based on the results of a study conducted on behalf of the State Government of North Rhine-Westphalia. The authors are responsible for the content.

Publisher:

Wuppertal Institut für Klima, Umwelt, Energie gGmbH
Döppersberg 19
42103 Wuppertal, Germany
www.wupperinst.org

Authors:

Jens Teubler, Pauline Schekira, Hannah Brauneis
jens.teubler@wupperinst.org

Please cite the publication as follows:

Teubler, J.; Schekira, P.; Brauneis H. (2023). Impact Report NRW Sustainability Bond #9. Investor Briefing on behalf of Ministerium der Finanzen des Landes Nordrhein-Westfalen. Wuppertal Institut für Klima, Umwelt, Energie gGmbH. Wuppertal, April, 2023.

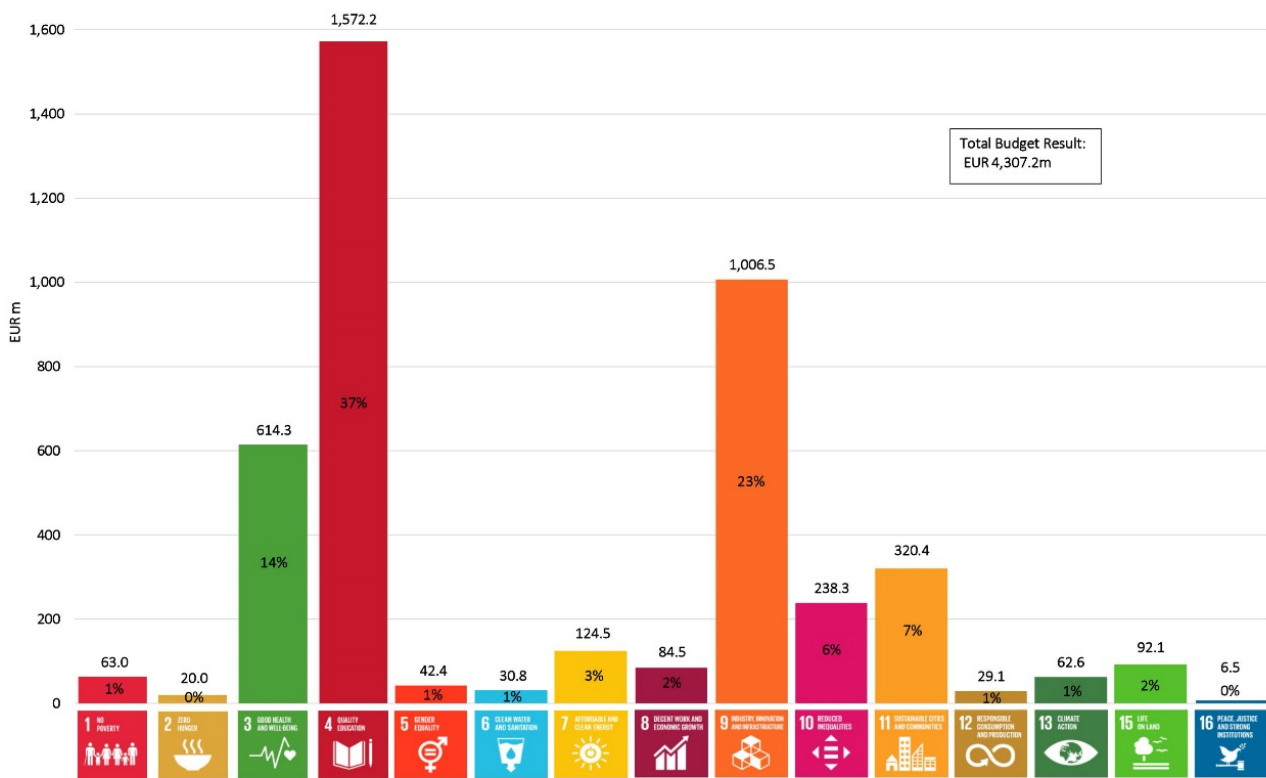
#Wuppertal, May 2023

Overview

The Wuppertal Institute analysed the NRW Sustainability Bond #9 (2022) on behalf of the State Government of North Rhine-Westphalia (NRW). The eligible assets of the most recent Bond amount to a volume of EUR 5.856bn¹ and are part of the budget plan 2022. EUR 4.307bn have been allocated to the respective budget results for 2022 (see allocation table in Annex). The selection of projects (72 eligible projects²) is done according to the Sustainability Bond Framework³, based on the NRW Sustainability Strategy 2020⁴ and aligned with the Sustainable Development Goals (SDGs).

Figure 1 shows the allocation per SDG. A large portion of the projects can be attributed to SDG 4 on quality education (37% of allocation) and SDG 9 on industry, infrastructure, and innovation (23%). The third largest share contributes to SDG 3 on good health and well-being (14%). However, the eligible projects contribute to almost all SDGs (except SDG 14 and 17) and many projects contribute to more than one SDG.

figure 1: weighted attribution of allocated eligible projects to Sustainable Development Goals



source: Ministry of Finance NRW, 2023

This Investor Briefing reports on indicators related to 54% of the budget results in the projects (EUR 2.323bn). It continues to apply the updated methodology presented in the previous Investor Briefing and Method Paper.

¹ In prior publications the eligible assets amounted to EUR 5.400bn according to the budget plan. The volume has been increased for some projects during the course of the year 2022 (s. Appendix).

² https://nachhaltigkeit.nrw.de/fileadmin/Dokumente/9_Nachhaltigkeitsanleihe/NRW-State-Eligible-Assets-Sus-Bond-9.pdf

³ https://nachhaltigkeit.nrw.de/fileadmin/Dokumente/9_Nachhaltigkeitsanleihe/NRW-State-Sustainability-Bond-Framework.pdf

⁴ https://nachhaltigkeit.nrw.de/fileadmin/Dokumente/NRW_Sustainability_Strategy_2020.pdf

In addition, results from previous impact reports for Sustainability Bonds #2 to #8 (and including the results of this report) are now listed in a separate file to be made available to any interested party. This file will be uploaded on the website of the issuer⁵.

Results

Summary

The Sustainability Bond NRW #9 covers projects in 14 categories that were aligned with the Green Bond Principles (GBP), Social Bond Principles (SBP) and Sustainability Bond Guidelines (SBG) by ICMA. Although some projects contribute to more than one dimension, these categories can be roughly divided into contributions to social targets (categories A to F) and environmental targets (categories G to N).

The following table 1 lists all 39 indicators and includes information on their quality, robustness, and attributed State expenditures.

table 1: indicators and indicator results for NRW Sustainability Bond #9 (budget year 2022)

Category (quantified share in %)	budget results	Indicators	Quality	Share	Indicator Value ^a	
			2022	2022		
A: Affordable Basic Infrastructure (100% assessed here)	EUR 666.0m	equivalent of promoted broadband access points (a)	C,	65.7%	147,200	beneficiaries (full contribution)
		equivalent of paid social tickets (a)	D,	6.0%	83,500	beneficiaries (full contribution)
		equivalent of paid student tickets (a)	D,	3.4%	102,500	beneficiaries (full contribution)
B: Access to Essential Services (47% assessed here)	EUR 2,426.8m	equivalent of paid vaccination centres	C,	1.5%	4	entities (full contribution)
		equivalent of promoted seats at nursing schools	D,	4.2%	5,000	beneficiaries (partial contribution)
		equivalent of promoted geriatric nurse students	D,	0.7%	3,500	beneficiaries (partial contribution)
		returned researchers	C,	0.3%	20	jobs created/sustained (full contribution)
		equivalent of paid pedagogical teachers (b)	D,	4.2%	2,500	jobs created/sustained (full contribution)
		equivalent of promoted day-care centre helpers (c)	D,	10.3%	17,000	jobs created/sustained (partial contribution)
		equivalent of paid social school workers (a)	C,	2.4%	900	jobs created/sustained (full contribution)
		equivalent of promoted first-year student places (d)	C,	2.1%	23,300	beneficiaries (partial contribution)
		children benefiting from day-care exemptions for parents	C,	17.7%	288,100	beneficiaries (partial contribution)
equivalent of promoted family centres (a)	C,	2.8%	3,400	entities (partial contribution)		
C: Affordable Housing (46% assessed here)	EUR 104.8m	equivalent of paid urban development projects (e)	D,	46.0%	18	projects (full contribution)
D: Employment Generation (41% assessed here)	EUR 6.4m	equivalent of jobs promoted for persons with disabilities (f)	B,	41.2%	132	jobs created/sustained (partial contribution)
E: Food Security and sustainable food systems (69% assessed here)	EUR 3.2m	equivalent of students supported with healthy meals	C,	68.9%	229,000	beneficiaries (partial contribution)
F: Socioeconomic advancement and empowerment (32% assessed here)	EUR 226.9m	equivalent of vulnerable persons receiving help (a)	B,	2.9%	3,100	beneficiaries (full contribution)
		equivalent of students supported for career-entry (a)	B,	5.5%	3,400	beneficiaries (full contribution)
		competence centers women and profession	D,	1.3%	16	entities (partial contribution)
		promoted women shelter places	C,	13.7%	673	beneficiaries (partial contribution)
		promoted men shelter centers	D,	1.1%	62	entities (partial contribution)
		promoted men shelter places	C,	0.3%	18	beneficiaries (partial contribution)
equivalent of paid personnel for integration centres	C,	2.7%	320	jobs created/sustained (full contribution)		
G: Renewable Energy (no indicator) (g)	EUR 15.0m				n.a.	no indicator
H: Energy Efficiency (59% assessed here) (h)	EUR 125.3m	equivalent of promoted low-carbon vehicles	C,	7.6%	2,000	vehicles (partial contribution)
		equivalent of promoted charging stations	D,	47.1%	39,490	projects (partial contribution)
		equivalent of promoted consultations for photovoltaics in municipalities	D,	1.0%	50	projects (partial contribution)
		equivalent of additional solar thermal capacity	C,	1.2%	8,800	[MWh] of re production/storage (partial contribution)
		equivalent of promoted ventilation systems with heat recovery	C,	1.9%	1,200	projects (partial contribution)
E: Pollution Prevention & Control (40% assessed here)	EUR 46.3m	promoted research for climate protection & environmental economics	D,	40.5%	376	projects (partial contribution)
J: Environmentally sustainable management of living natural resources and land use (95% assessed here)	EUR 70.6m	equivalent of sustainable land-use	C,	45.2%	42,900	[ha] of sustainable land-use (full contribution)
		equivalent of animals in animal-friendly husbandry	C,	0.0%	200	animals benefiting (full contribution)
		equivalent of paid full-time project work for biological stations	C,	49.3%	300	jobs created/sustained (full contribution)
K: Clean transportation (30% assessed here)	EUR 100.2m	additional lanes for bicycles	C,	30.0%	111	[km] of bicycle lanes (partial contribution)
L: Sustainable water and wastewater management (83% assessed here)	EUR 77.0m	future additional retention volume (flood retention, Rhine area) (j)	C,	n.a.	74	[million m ³] water retention (partial contribution)
		future additional retention area (dyke relocation, Rhine area) (j)	C,	n.a.	922	[ha] natural retention area (partial contribution)
M: Climate change adaptation (86% assessed here)	EUR 41.4m	promotion of nature-conservation projects	D,	1.0%	8	projects (partial contribution)
N: Green buildings (71% assessed here)	EUR 397.4m	re-afforestation of damaged forests	B,	86.5%	337,500	[ha] of sustainable land-use (full contribution)
		equivalent of university and university clinic building expansion	D,	60.7%	49,700	[m ²] of new buildings (full contribution)
		equivalent of university and university clinic building modernisation	D,	10.5%	98,900	[m ²] of building area renovated (full contribution)

^a rounded in most cases to avoid the appearance of accuracy where it is not warranted
^(a) potential number based on funding alone (without other promotions)
^(b) representing the funding of full-time positions for language support only
^(c) funding for only 7 months at a monthly rate of EUR 2,100 per day-to-day helper
^(d) based on no. of additional first-year students in 2020
^(e) based on lump promotion and State's share for urban development programs in NRW (including other programs)
^(f) the initial promotion relates to job creation and is therefore considered a intermediate-outcome rather than project output
^(g) based on PV capacity growth in previous years in NRW and average full-load hours for the State
^(h) the previous assessment reported additional solar capacity here but the related programme has been discontinued (and there is currently not sufficient information on the programme that replaces it)
⁽ⁱ⁾ the previous bond included a programme to specifically fund electricity production from photovoltaics that is no longer part of the bond
^(j) These estimates relate to planned measures in the NRW part of the river Rhine area from 2022 onward. The direct funding for these measures in 2022 (compared to the total funding) could not be ascertained.

source: own compilation based on current methodology

The overall effects can be summarized with the help of so-called units of comparison like the number of beneficiaries or the building area renovated. These represent numerical effects that allow to compare indicators between different Bonds by the issuer. Some of these effects can solely attributed to the Bond (full contribution), while others constitute a partial contribution.

⁵ <https://nachhaltigkeit.nrw.de/en/sustainability-bonds-nrw/sustainability-bond-10-of-the-state-of-north-rhine-westphalia>

Over 890,000 people – ranging from students in schools to homeless persons – benefited in 2022 from projects in the Bond. Out of this group, roughly 340,000 of these beneficiaries can be solely attributed to funding by the State of NRW. In addition, circa 21,000 jobs were either created or sustained, with 4,000 jobs from a full contribution.

In the area of environmental effects, 77,000 ha is fully attributed to sustainable land-use, resulting from projects for organic farming and re-forestation. Another 149,000 m² of building area is fully attributed to green construction and renovation of university and clinical buildings. A further 111 km of new bicycle lanes and more than 2,000 low-carbon vehicles can at least be partially attributed to the Sustainability Bond.

Regarding climate change adaptation, current expenditures and measures correspond to a future water retention of 74 million m³ of water and 920 ha of natural retention area in the Rhine area of NRW.

The following sections will investigate social effects, environmental effects as well as co-benefits for climate change mitigation in more detail. A full accounting of all indicators as well as the underlying data and methods will be shown in the upcoming method description.

Social Effects

Desired societal outcomes can be mainly attributed to categories A to F (as shown in table 2) and categorized regarding their position in an impact pathway. We distinguish between activities (efforts towards outputs), outputs (tangible programme results) and outcomes (indicating desired effects on a larger or regional scale). Overall, 51% of the allocated expenditures can be associated with benefits to society in this manner.

table 2: assessed and quantified expenditures for social effects

Categories	Allocated Expenditures	Quantified impacts of Expenditures
A Affordable basic infrastructure	EUR 666.0m	EUR 500.2m (75.1%)
B Access to essential services	EUR 2,426.8m	EUR 1,143.0m (47.1%)
C Affordable housing	EUR 104.8m	EUR 48.2m (46.0%)
D Employment generation	EUR 6.4m	EUR 2.6m (41.2%)
E Food security and sustainable food systems	EUR 3.2m	EUR 2.2m (68.9%)
F Socioeconomic advancement and empowerment	EUR 226.9m	EUR 73.5m (32.4%)
in Total	EUR 3,434.1m	EUR 1,769.7m (51.5%)

source: own calculation

The majority of funding towards social goals is used for improving access to essential services (B) like health care and education. Most indicators in category B relate to persons benefiting from these programmes (e.g., promoting additional first-year students at universities) or jobs created in these sectors (e.g., supporting the salaries of professionals or educating trainees). More than 350,000 persons are positively affected in this way. Regarding the assessment, 6 out of 10 indicators quantified are tangible results (outputs).

The second largest category (A) comprises of projects for affordable basic infrastructures. One output-indicator and two activity-indicators were assessed here: access to broadband internet (circa 147,000 households and/or entities), promoting social tickets (funding sufficient⁶ for 83,500 tickets) and promoting tickets for students and trainees (funding sufficient for 103,000 tickets).

The third largest category for socioeconomic advancement and empowerment (F) covers a broad range of activities such as reduction of poverty, protection against violence or gender equality and inclusion of migrants. 7 indicators were quantified here (2 intermediate outcomes, 3 outputs and 2 activities), that mostly relate to direct beneficiaries (circa 7,000) like supporting students for career-entry or women and men in sheltered places.

Among the smaller categories, 18 urban development projects are promoted (activity towards affordable housing), circa 130 jobs are created for persons with disabilities (outcome towards employment generation) and over 220,000 school children benefit from frequent vegetables and fruits in the EU school programme (output towards food security).

Environmental Impacts

The area of environmental effects was assessed in the same manner as social effects (activities, outputs, and outcomes). Direct environmental effects are attributed to the categories G to N (with no available indicator for renewable energy in category G).

table 3: assessed and quantified environmental effects

Categories	Allocated Expenditures	Quantified impacts of Expenditures
G Renewable energy	EUR 15.0m	EUR 0.0m* (0%)
H Energy efficiency	EUR 125.3m	EUR 73.7m (58.8%)
I Pollution prevention and control	EUR 46.3m	EUR 18.8m (40.5%)
J Environmentally sustainable management of resources	EUR 70.6m	EUR 66.7m (94.5%)
K Clean transportation	EUR 100.2m	EUR 30.0m (30.0%)
L Sustainable water and wastewater management	EUR 77.0m	EUR 63.5m (82.5%)
M Climate change adaptation	EUR 41.4m	EUR 35.8m (86.5%)
N Green buildings	EUR 397.4m	EUR 283.0m (71.2%)
in Total	EUR 873.2m	EUR 571.5m (65.4%)

*no indicator assessed in this category

source: own calculation

Category N is both the largest category here and the highest volume assessed in terms of indicators. As shown for co-benefits of climate mitigation later on, this category solely focuses on either the construction, renovation, or modernisation of university and clinical buildings (including equipment for e.g., research). It is estimated that circa 50,000 m² of building area are added and circa 100,000 m² are renovated (activity-indicators).

⁶ The grand total of promoted social and student tickets is much larger. These amounts relate to the number of tickets that could be purchased from the funding alone.

The projects in the second largest category H (energy efficiency) comprise of a broad variety of state-funded programmes, in particular promoting innovations or supporting the purchase of low-carbon technologies like electric vehicles, charging stations or solar thermal panels for houses. Three output and two activity-indicators were assessed here that all relate to grants as part of the programme “Energy systems of the future, system transformation, innovation, e-mobility and energy efficiency”. We estimated, based on these grants, a partial contribution of the State for 2,000 electric vehicles (including bicycles), 8,800 MWh of renewable energy production from solar-thermal panels and 1,200 promoted ventilation systems for heat recovery in buildings. An additional 50 consultations regarding the use of photovoltaics in municipalities were likely conducted and circa 40,000 charging stations promoted.

In the area of clean transportation (K), all funds were used to support municipalities in building bicycle lanes (especially on roads). It has been reported⁷ that at least 111 km of bicycle lanes were constructed (output-indicator) in 2022 (based on past efforts), that also help to reduce GHG emissions (shown in the section on “Co-Benefits of GHG Savings” where also other additional bicycle lanes are estimated).

In category L on sustainable water and wastewater management, two output-indicators were assessed regarding measures for flood retention in the rhine area. The current financing partially contributes to projects that will provide an additional retention volume of 74 m³ of water and circa 920 ha of additional retention area from the re-location of dykes.

Category J on the sustainable management of natural resources constitutes the fifth largest share of quantified programmes. Three outputs are assessed here: 43,000 ha of sustainable land-use from eco-friendly agriculture, circa 200 animals benefiting from animal-friendly husbandry and 300 jobs from paid project hours in biological stations.

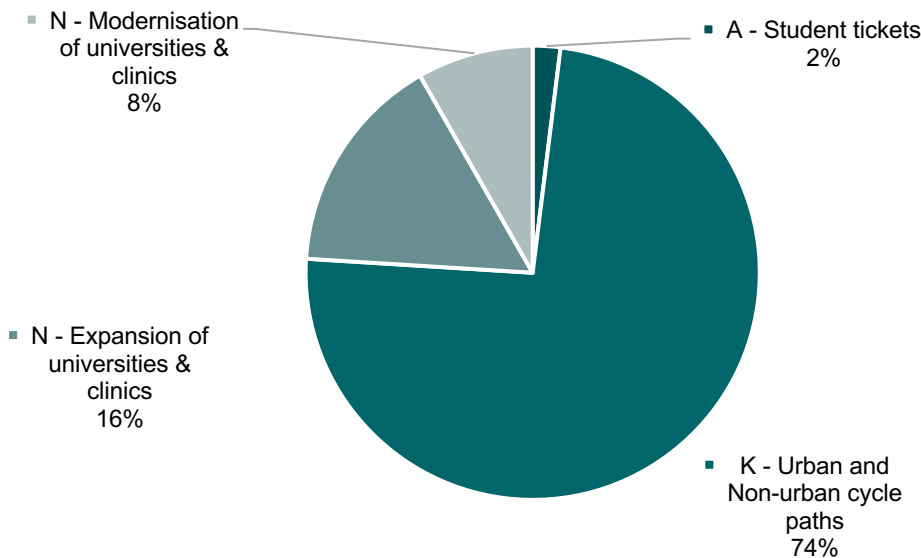
The target of climate-change adaption is addressed in category M. Two indicators could be assessed: the (partial) funding of 8 nature-conservation projects (activity-indicator) as well as more than 34,000 ha of sustainable land-use from re-forestation (full contribution to a desired outcome).

⁷ <https://www.land.nrw/pressemitteilung/rueckenwind-fuer-den-radverkehr-30-millionen-euro-fuer-den-ausbau-und-die>

Co-Benefits for Climate Change Mitigation

The estimated GHG emissions avoided by the Bond can be attributed to investments of EUR 430m for 5 different measures. The measures are part of investments in category A (student tickets), K (urban cycle paths; non-urban fast cycle paths) and N (modernisation of university buildings; conservation, remediation and enlargement of university clinics as well as other investments). The measures are expected to save approximately 524,000 tons of CO₂-equivalents (unit [CO₂e]) over their lifetime (see figure 2) or 26,600 tons per year. Assuming that a tree absorbs circa 3,5 tons of CO₂ over his lifetime⁸, the potential annual savings are equivalent to 7,600 additional planted trees.

figure 2: GHG savings (over lifetime) from projects in NRW Sustainability Bond #9



source: own calculations

Annual results for each measure range from 1,255 tons CO₂e per year to 10,926 CO₂e tons per year (see table 4). With the exception of student tickets, all of these measures are expected to save emissions beyond the term of the Sustainability Bond.

table 4: GHG savings from projects in categories A, K and N

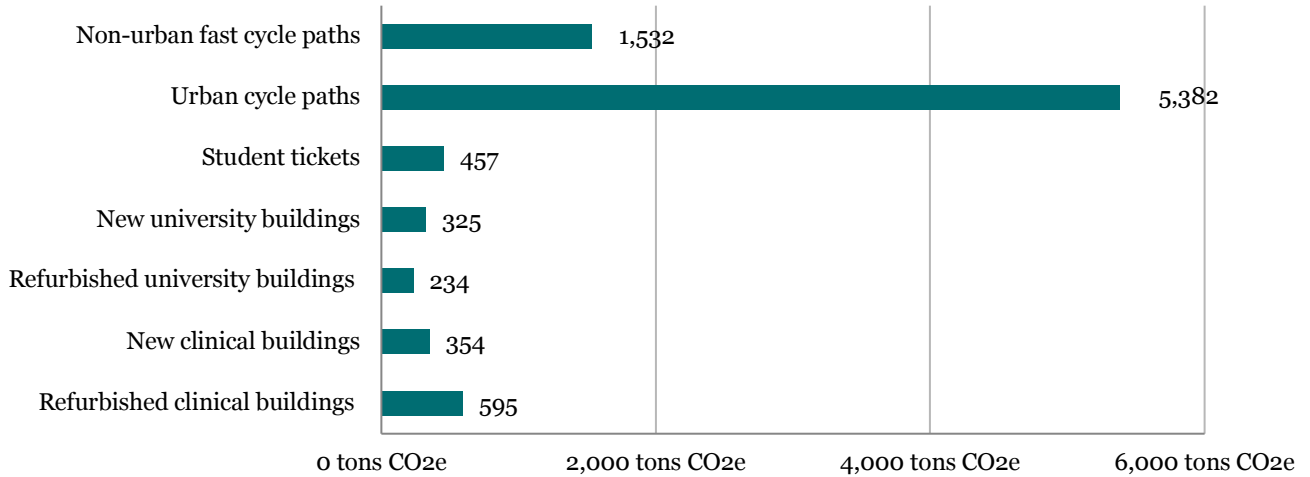
Measure	GHG savings per year <i>in tons CO₂e</i>	GHG savings over Lifetime <i>in tons CO₂e</i>	average Lifetime (assumption) <i>in years a</i>
Non-urban fast cycle paths	2,006	60,191	30
Urban cycle paths	10,926	327,790	30
Student tickets	10,309	10,309	1
Expansion of universities & clinics	1,255	82,550	50-66
Modernisation of universities & clinics	2,166	43,320	20

source: own calculation based on methods and data depicted in the method description

⁸ For a beech tree over his lifetime according to <https://www.wald.de/waldwissen/wie-viel-kohlendioxid-co2-speichert-der-wald-bzw-ein-baum/>

In terms of investments, the anticipated impacts can be normalised to represent the GHG savings over lifetime when one million Euro are invested (see figure 3).

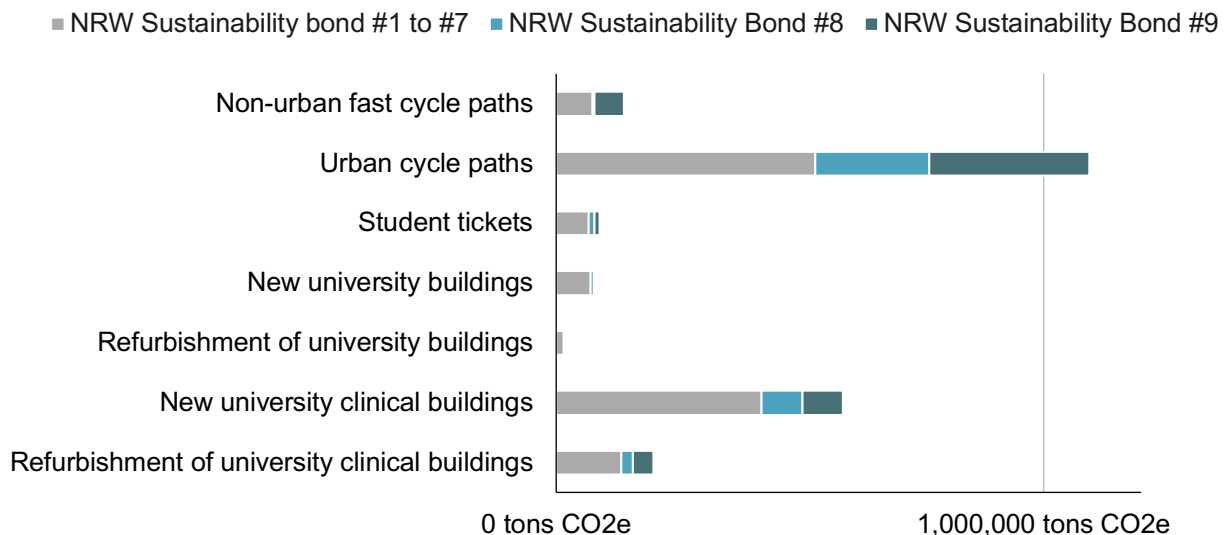
figure 3: efficiency of co-benefits of GHG savings from NRW Sustainability Bond #9



source: own calculation based on methods and data depicted in the method description

All of these projects (at least in terms of materialization) in the Sustainability Bond #9 were already part of the Sustainability Bonds #1 (2015) up to #8 (2021). Consequently, the categories can be aggregated into a nine-year portfolio⁹. In total, these projects help to mitigate over 2.2 million tons of GHG emissions over the assumed lifetime of the measures (see figure).

figure 4: GHG savings over lifetime of projects from 2014 to 2022



source: own calculation based on methods and data depicted in the method description

⁹ For single measures, such as solar thermal energy generation (Bond #3) or combined heat and power (Bond #2), this was not feasible.

Additional climate change mitigation effects can be attributed to the States' share of funding for projects in the European Regional Development Fund (ERDF) as well as support of companies as part of the promotion of the "Effizienz Agentur NRW" (efa+) and "Ökoprofit". These programmes help stakeholders towards higher energy efficiency, material efficiency, water and waste savings. Previous reports accumulated the validated GHG savings by these entities over several bonds at once but the required data was restricted to budget years before issuance. For example, the investor briefing of NRW Sustainability Bond #8 reported only on 3rd party information up to the budget year of 2020, while the report itself provided indicators in all other areas for the budget year 2021.

We use an alternative approach this year to estimate the anticipated GHG savings for the budget year in question (2022 for NHA NRW #9). It is estimated how the States' expenditures in 2022 contribute to potential GHG savings by relating previous savings with previous expenditures. The underlying data and context are shown in table 5. According to this estimation, NHA NRW #9 fully contributes to annual GHG savings of 13,000 tons CO₂-equ. for efa+ and partially contributes to GHG savings of 14,800 tons for Ökoprofit and 4,400 tons for the ERDF.

table 5: estimated GHG savings from efa+, Ökoprofit and ERDF

Programme	Contribution	Budget Result #2 to #7 (2015-2020)	GHG Savings* 2015-2020	Expenditures** #9 (2022)	GHG Savings NRW Sust. Bond #9
ERDF	partial	EUR 135.7m	26,000 t CO ₂ e	EUR 23.1m	4,400 t CO ₂ e/a
efa+	full	EUR 30.4m	83,000 t CO ₂ e	EUR 4.8m	13,000 t CO ₂ e/a
Ökoprofit**	partial	EUR 1.5m**	111,000 t CO ₂ e	EUR 0.2m	14,800 t CO ₂ e/a

* these (validated) effects cannot be solely attributed to funding by the State of NRW as additional funds were necessary to achieve the goals (such as EU funding or own financial efforts by the stakeholders)
 ** All expenditures are estimates, as they related budget items cover more than the programmes shown here. For ERDF, other measures into green infrastructures are included, while the expenditures for efa+ and Ökoprofit are covered under the same budget item.

source: previous reporting¹⁰

¹⁰ https://nachhaltigkeit.nrw.de/fileadmin/Dokumente/9_Nachhaltigkeitsanleihe/impact-report-WI-NHA-NRW.pdf

Annex

Allocation Report by NRW Ministry of Finance

The following table lists the budget plan and budget results for all projects in the NRW Sustainability Bond #9. In total, EUR 4.307bn, which is more than 100% of the Bond volume (EUR 3.5bn), have been allocated to eligible projects.

EUR 412m of the budget result (9.6%) of all projects have been allocated to activities in alignment with the EU Taxonomy (EUT aligned). This is 47.2% of all green expenditures of Sustainability Bond #9 or 54.9% of the projects in scope of the analysis.

SDGs	Projects [types: social (S) environmental (E)] * additional funding for Covid-19 projects compared to prior publications	Budget 2022 (million EUR)		
		Plan	Result	Budget Result EUT - aligned
A Affordable basic infrastructure		691	666	
9	Broadband expansion/Digitalization	S	512.0	486.9
1 11	Public transportation for low-income citizens	S	40.0	39.9
11	Public transportation for pupils and students	S	139.2	139.2
B Access to essential services		3.810	2.427	
3	Health expenditures to deal with the coronavirus pandemic	S	19.1	3.6
3	Investment programme for hospitals and nursing schools	S	407.6	102.4
3	Vaccination against SARS-CoV-2	S	816.2*	167.0
3	Hospital structure fund (State's share)	S	95.0	95.0
3	Combating the dangers of addiction	S	16.3	14.0
3	Health economy, telematics, further development of the health campus	S	10.8	5.1
3	Health aid, health protection, action plan hygiene, epidemics control	S	7.6	7.2
3	Measures to ensure medical care	S	2.5	2.1
3	Psychiatric care	S	3.0	1.1
3	Development plan on geriatric care	S	16.3	10.6
3	Professional education of geriatric nurses	S	31.5	15.8
3 4	Bund-Länder-Covenant for the expansion of universities	S	207.3	207.3
4 8	Training facilities for the education of special education teachers	S	21.2	21.2
4 8 10	Measures to improve the quality of teaching and studying at universities	S	300.0	300.0
4	Return programme for highly qualified young researchers from abroad	S	6.9	6.9
4 8 9	Support for family centres/promotion of cooperation of family formation [...]	S	71.4	68.2
1 10	PlusKita and language courses at childcare facilities	S	101.5	101.1
4 10	Childcare in special cases	S	21.0	21.5
4 10	Exemption to contribution for parents for the last two years of day care	S	434.1	429.4
4	Measures at day care centres in response to the coronavirus pandemic	S	447.1*	277.8
4	Health-related measures at schools in response to the coronavirus pandemic	S	440.8*	298.2
3 4	Digitalization in schools to secure teaching during the coronavirus pandemic	S	37.7	25.5
4 10	Social work at schools	S	57.7	57.4
4	Excellence Strategy	S	32.0	26.3
4 10	Promotion of innovation	S	120.0	84.7
9	Johannes-Rau-Forschungsgemeinschaft	S	14.2	12.6
8 9	Research and innovation in the fields of sustainable development	S	35.2	34.4

SDGs	Projects [types: social (S) environmental (E)] * additional funding for Covid-19 projects compared to prior publications		Budget 2022 (million EUR)		
			Plan	Result	Budget Result EUT - aligned
9	Sustainable development	S	1.8	1.1	
8 9	Foundation for Nature and Sustainable Development	S	2.0	2.0	
4 12	Facilities for environmental education	S	2.5	2.5	
4 12	Consumer protection	S	29.4	24.7	
C Affordable housing			151	105	
9 11	[...] "Urban Reconstruction in the West" and "Growth and Sustainable Renewal"	S	53.6	36.2	
8 9 11	[...] "Social City" and "Social Cohesion"	S	47.8	21.6	
9 11	State programme for village renewal	S	50.0	47.0	
D Employment generation			12	6	
8 10	Occupational integration of people with disabilities	S	7.7	2.6	
8 9	Environmental economy, sustainable economy	S	1.6	1.0	
8 9	Green economy	S	3.0	2.8	
E Food security and sustainable food systems			4	3	
3 4	EU school programme	S	3.7	3.2	
F Socioeconomic advancement and empowerment			276	227	
1 10	Fight against poverty and social exclusion	S	10.8	8.3	
4 8	European Social Fund 2014-2020 [...] "No dead-end qualification" [...]	S	39.4	32.0	
5 8	Equality and potential development in work and society	S	5.0	3.0	
4 5	Promotion of equality at universities	S	4.5	4.4	
5 16	Girls in special situations	S	1.1	1.0	
16	Protection of children	S	7.9	2.5	
5 16	Protection from violence	S	41.2	38.7	
8 10 11	Social inclusion of persons with disabilities	S	4.0	3.4	
4 8 10	Measures for children from refugee families and for young refugees	S	12.6	11.7	
10	Municipal integration management	S	75.0	57.9	
10	Promoting integration of migrants living together in diversity	S	74.4	64.0	
G Renewable energy			17	15	
7	Energy Transition	E	15.3	15.0	
7	Pumped-storage hydroelectric plants	E	2.0	0.0	0.0
H Energy efficiency			168	125	
7 9	Energy systems of the future, system transformation, [...]	E	162.6	120.6	112.9
7 12	Enhancement of resource efficiency	E	5.9	4.8	4.8
I Pollution prevention and control			65	46	
7 9	Energy research offensive and real laboratories	E	28.8	18.8	18.8
9 13	Target group-oriented climate protection	E	3.4	0.6	
12	Circular economy and resource efficiency	E	8.1	3.8	
7 13 15	European Regional Development Fund (ERDF) 2014-2020 (State's share)	E	25.2	23.1	
J Environmentally sustainable management of resources			91	71	
2 15	Responsible agriculture	E	12.9	8.2	
2	Improvement of animal welfare	E	1.4	0.0	

SDGs	Projects [types: social (S) environmental (E)] * additional funding for Covid-19 projects compared to prior publications		Budget 2022 (million EUR)		
			Plan	Result	Budget Result EUT - aligned
2 15	European Agricultural Fund for Rural Development – EAFRD (State's share)	E	33.8	23.7	
15	Protection of nature	E	37.9	34.8	
15	Soil protection	E	4.7	3.9	
11	Green infrastructure	E	0.7	0.0	
K Clean transportation			102	100	
11	Infrastructure for cyclists and pedestrians	E	102.0	100.2	100.2
L Sustainable water and wastewater management			80	77	
6 13 15	Flood protection and river restoration	E	80.2	77.0	77.0
M Climate change adaptation			58	41	
13 15	Climate Action/Regional Climate Adaptation Measures [...]	E	12.6	3.9	
13 15	Forests reforestation	E	45.7	37.5	37.5
N Green buildings			329	397	
4 9	Modernisation of university buildings	E	17.6	5.7	
3 9	Conservation, remediation, and enlargement of university clinics [...]	E	311.5	391.7	60.8
in Total			5,855.7	4,307.2	411.8

source: data provided by the Ministry of Finance of North Rhine-Westphalia (NRW)

NRW Sustainability Bond Programme (2015-2022)

NRW Sustainability Bonds – Emissions

Matching of Bonds (sorted by end-of-term)*matured	Amount (EUR)
#2 NRW 0.125% 16-Mar-2023 (ISIN DE000NRWoJF6)*	€ 1,585,000,000
#1 NRW 0.5% 11-Mar-2025 (ISIN DE000NRWoGP1)	€ 750,000,000
#3 NRW 0.5% 16-Feb-2027 (ISIN DE000NRWoKB3)	€ 1,825,000,000
#4 NRW 0.95% 13-Mar-2028 (ISIN DE000NRWoK03)	€ 2,025,000,000
#6/1 NRW 0.00% 26-Nov-2029 (ISIN DE000NRWoLZ0)	€ 1,000,000,000
#5 NRW 1.10% 13-Mar-2034 (ISIN DE000NRWoLM8)	€ 2,250,000,000
#7 NRW 0.00% 12-Oct-2035 (ISIN DE000NRWoML8)	€ 2,400,000,000
#6/2 NRW 0.50% 25-Nov-2039 (ISIN DE000NRWoL02)	€ 1,500,000,000
#8/1 NRW 0.125% 04-Jun-2031 (ISIN DE000NRWoMY1)	€ 2,000,000,000
#8/2 NRW 0.6% 04-Jun-2041 (ISIN DE000NRWoMZ8)	€ 1,500,000,000
#9/1 NRW 2% 15-Jun-2032 (ISIN DE000NRWoNF8)	€ 2,000,000,000
#9/2 NRW 2.25% 14-Jun-2052 (ISIN DE000NRWoNG6)	€ 1,500,000,000
in Total Issued	€ 20,335,000,000
in Total Outstanding	€ 18,750,000,000

source: issuer (Ministry of Finance NRW, 2022)

Allocation Table

The following table shows the budget plan figures and budget results for the eligible assets of NRW's Sustainability Bonds #1-9 sorted according to the categories of the updated framework (February 2021)¹¹. The net proceeds for social assets (A-F) make up 78.1% in the budget plan and 76.6% in the budget results. Accordingly, green assets (G-N) contribute 21.9% to the budget plan and 23.4% to the budget results.

Eligible Sustainability Category		Budget plan 2014-2022		Budget result 2014-2022	
		EUR	share	EUR	share
A	Affordable basic infrastructure	€ 3,186,503,100	11.2%	€ 3,249,513,324	12.9%
B	Access to essential services	€ 16,868,169,117	59.3%	€ 14,262,733,671	56.6%
C	Affordable housing	€ 815,864,000	2.9%	€ 675,728,376	2.7%
D	Employment generation	€ 80,355,715	0.3%	€ 51,296,505	0.2%
E	Food security and sustainable food systems	€ 12,285,000	0.0%	€ 9,483,918	0.0%
F	Socioeconomic advancement and empowerment	€ 1,225,720,500	4.3%	€ 1,055,431,677	4.2%
G	Renewable energy	€ 122,258,000	0.4%	€ 38,898,330	0.2%
H	Energy efficiency	€ 586,297,200	2.1%	€ 538,588,053	2.1%
I	Pollution prevention and control	€ 418,188,971	1.5%	€ 280,361,253	1.1%
J	Environmentally sustainable management [...] *	€ 669,927,128	2.4%	€ 569,863,909	2.3%
K	Clean transportation	€ 345,150,000	1.2%	€ 304,331,640	1.2%
L	Sustainable water and wastewater management	€ 443,461,400	1.6%	€ 401,230,582	1.6%
M	Climate change adaptation	€ 187,399,700	0.7%	€ 119,464,334	0.5%
N	Green buildings	€ 3,463,133,900	12.2%	€ 3,635,537,691	14.4%
in Total		€ 28,424,713,731	100%	€ 25,192,463,261	100%

* Environmentally sustainable management of living natural resources and land use

source: Ministry of Finance NRW, 2023

¹¹ Note that at the date of issuance the assets of Bonds # 1-7 were categorized into the categories according to the framework at the date of issuance. For this reason, the categorization as well as the share of social and environmental assets might deviate from previous publications.

Short Overview of Method Update

The full and detailed description of all quantified indicators as well as the required data and assumptions will be shown in an update of the already published “Method Description”. This new methodology, first introduced for the impact assessment of NRW Sustainability Bond #8, qualifies reported values according to the following characteristics: **Qualification** (What is the context of the measured effect?), **Robustness** (How was the value determined?), **Attributability** (Is the State of NRW the sole promoter of the effect?), **Accumulability** (Which values can be summed up over a period of time?)

Qualification

Indicators are qualified according to their position in an outcome pathway. Indicators that measure long-term and persistent outcomes towards overarching goals have the highest quality A (no indicator in the current report achieved this quality). Intermediate outcomes (B) describe desired changes beyond the scope of the programmes and projects on a societal or regional level (4 out of 37 indicators). The more common output-indicators (C) relate to tangible results on the level of projects (15 out of 37). Activity-indicators are classified as D and comprise of resources deployed to achieve outputs and outcomes (20 out of 37 indicators). The minimum quality E refers to inputs in the system. They describe the interventions by the actor (here the State of NRW). All funding towards projects in the NRW Sustainability Bond are considered to be inputs, as their eligibility is defined by the issuer’s framework and corroborated by a second-party opinion (SPO).

Robustness

The robustness of the indicators is defined in the following table.

Robustness	Criteria
1	primary data (directly monitored or evaluated)
2	directly estimated from primary data
3	calculated with the help of secondary sources or auxiliary variables
4	estimated on the basis of models with a simplified universal mechanism
5	results from 3rd party reporting without the possibility for validation

Attributability

The main goal of quantification is to attribute effects solely to the interventions by the State of NRW. However, not all available data (or other information) allows for such a contribution. In these cases, the indicator is indicated as “partial contribution”, rather than “full contribution”.

Accumulability

All indicators are assigned to “units of comparison”. This allows to accumulate the effects between projects as well as compared to previous Bonds. However, doing so might constitute double counting in some cases.