



DZ HYP AG
GREEN BOND CONSULTING

Portfolio Assessment & Impact Reporting

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MANAGEMENT SUMMARY

Sustainable Finance Consulting for DZ HYP AG

INTRODUCTION

DZ HYP AG assigned Drees & Sommer with the sustainable finance consulting to fulfill the client's intent of performing a low carbon building portfolio assessment and environmental impact reporting for its green bond program.

PORTFOLIO ASSESSMENT

Verifying the client's set of eligibility criteria and delivered portfolio asset information forms the foundation of the portfolio assessment. The aim of the portfolio assessment is to enable an identification of "green" assets which comply with the set of established green bond eligibility criteria.

Assets cover the low carbon buildings classes residential, and non-residential (office, retail, logistics, hotel) in Germany and do have either an energy performance certificate (consumption or demand-based), a building energy code of EnEV2016/GEG 2020, or a green building certification.

For each asset, key information such as the certified building energy performance, the energy carriers for heating (e. g. district heating, gas, oil, heat pump) and electricity were applied to reference building area-specific final and or primary energy use.

REFERENCE BENCHMARKS (ENERGY & CO2)

The environmental impact covers the operational energy and carbon emissions savings of green eligible assets within the portfolio against a national building usage specific reference asset (notional building). All sources and applied values consist of public-accessible and building-usage representative data from official German national institutions.

To establish reference benchmarks for energy and CO₂, the existing building stock is matched with the corresponding building energy legislative codes and requirements to identify period of years of construction with typical reference building energy performances.

Identifying the distribution of energy carriers for heating and electricity enables the determination of building-stock weighted national reference primary energy conversion factors and operational carbon emissions equivalents for each assessed residential and non-residential asset class.

Based on the typical reference building energy performance, the converted reference benchmarks with primary energy and carbon emissions are established to state an average typical building performance in Germany representing the national existing building stock information.

ENVIRONMENTAL IMPACT

The difference in environmental (energy & CO₂) performance between the green asset of the client's portfolio and the national reference benchmark represents the energy savings and the carbon emissions savings, highlighting the environmental impact of the portfolio impact reporting.

For assets without a data-available actual CO₂-performance, the final energy savings are being transformed into carbon emissions savings based on the building-stock weighted national reference carbon emissions equivalents.

This following documentation summarizes the key results of the portfolio assessment, the impact reporting and the national reference benchmarks as of February 2022.

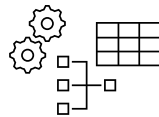


MILESTONES & PROCESS

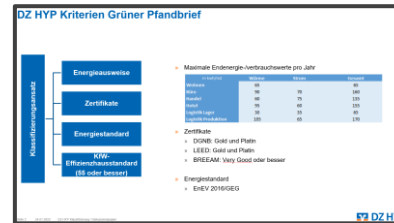
Workstream – Focus Portfolio Assessment & Impact Reporting

- DZ HYP (Client) has a set of eligibility criteria in place
- Portfolio Assessment and Impact Reporting are based on the provided eligibility criteria.
- Assets cover the low carbon buildings classes residential, and non-residential (office, retail, logistics, hotel).
- Assets do have an energy performance certificate (consumption or demand-based) or a green building certification and are located in Germany.

Data structure and process



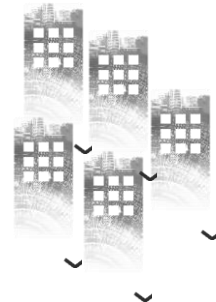
Green Finance Framework



Reference Benchmarks Energy & GHG



Portfolio (essential assets' data structured)



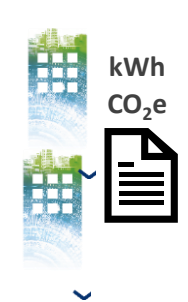
Portfolio Assessment

Portfolio (identified green eligible assets)

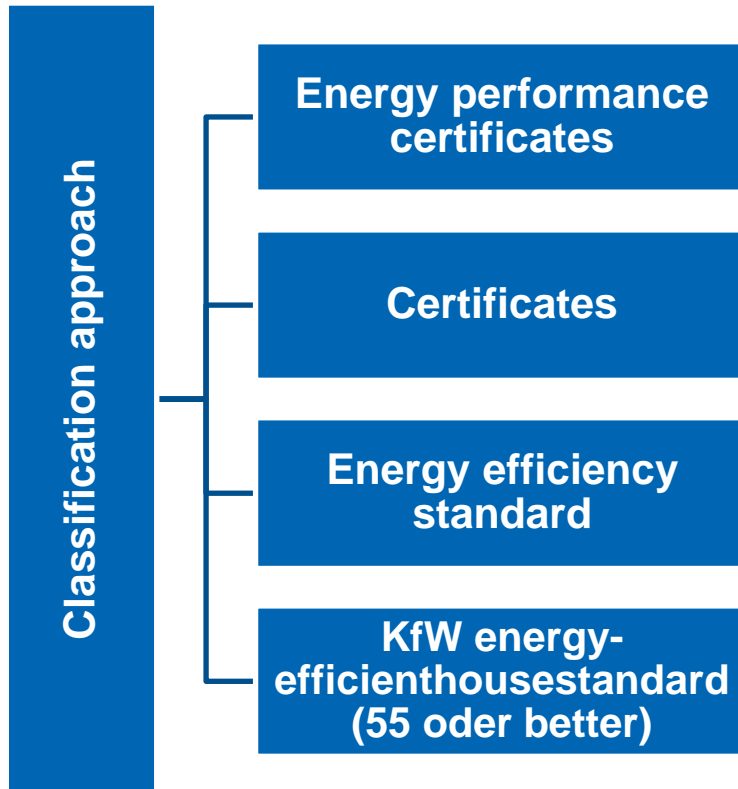


Portfolio Impact

Impact Reporting (Energy and GHG savings)



DZ HYP Use of Proceeds



- » Maximum final site energy per m²/year:


kwh/m2	Heating	Electricity	Total
Residential	65		65
Office	90	70	160
Retail	60	75	135
Hotels	95	60	155
Logistics buildings (storage)	30	35	65
Light industrial (production)	105	65	170

- » Certificates:
 - » DGNB: Gold and Platinum
 - » LEED: Gold and Platinum
 - » BREEAM: Very Good or better
- » Energy efficiency standard
 - » EnEV 2016/GEG


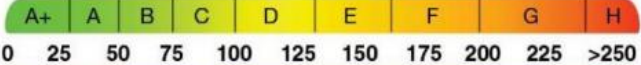


SUSTAINABLE FINANCE

National reference benchmarks for impact

		Non-Residential		Office		Logistic		Retail			Hotel									
National reference building stock		Unit	Office		Storage		Non-Food		Food	Reference	Hotel 3*/4*									
Final energy	Building stock weighted reference benchmark: consumption	kWh/m²a	Heating: 136	Electricity: 50	Total: 186	Heating: 82	Electricity: 52	Total: 134	Heating: 117	Electricity: 75	Total: 186	Heating: 215	Electricity: 244	Total: 459	Heating: 159	Electricity: 118	Total: 277	Heating: 105	Electricity: 115	Total: 220
	CO ₂ -Emissions	kgCO ₂ /m²a	Heating: 30	Electricity: 28	Total: 58	Heating: 20	Electricity: 29	Total: 49	Heating: 32	Electricity: 42	Total: 74	Heating: 65	Electricity: 137	Total: 201	Heating: 44	Electricity: 66	Total: 110	Heating: 24	Electricity: 64	Total: 88
	National energy carrier distribution-weighted: CO ₂ -equivalent intensity	gCO ₂ /kWh	Heating: 222	Electricity: 560	Ref.: 291	Heating: 240	Electricity: 560	Ref.: 364	Heating: 276	Electricity: 560	Ref.: 387	Heating: 276	Electricity: 560	Ref.: 476	Heating: 276	Electricity: 560	Ref.: 397	Heating: 231	Electricity: 560	Ref.: 403

Drees & Sommer benchmarks for assets located in Germany. Status: January 2022. Operational carbon emissions cover scope 1 and scope 2 emissions, according to national scope.

		Residential: reference benchmarks Energy & CO ₂					Residential - Year of construction – reference benchmarks					Residential - EPC rating																																												
Residential building stock weighted reference benchmarks:		Residential building stock weighted reference benchmark:					<table border="1"> <thead> <tr> <th rowspan="2">Year of construction</th> <th>SFH</th> <th>estimated</th> <th>MFH</th> <th>estimated</th> </tr> <tr> <th>kWh/m²a</th> <th>EPC*</th> <th>kWh/m²a</th> <th>EPC*</th> </tr> </thead> <tbody> <tr> <td>...-1919</td> <td>263</td> <td>H</td> <td>206</td> <td>G</td> </tr> <tr> <td>1919-1948</td> <td>260</td> <td>H</td> <td>196</td> <td>F</td> </tr> <tr> <td>1949-1978</td> <td>250</td> <td>H</td> <td>181</td> <td>F</td> </tr> <tr> <td>1979-1990</td> <td>190</td> <td>F</td> <td>147</td> <td>E</td> </tr> <tr> <td>1991-2000</td> <td>131</td> <td>E</td> <td>115</td> <td>D</td> </tr> <tr> <td>2001-2010</td> <td>94</td> <td>C</td> <td>85</td> <td>C</td> </tr> <tr> <td>2010-...</td> <td>36</td> <td>A</td> <td>47</td> <td>A</td> </tr> </tbody> </table>					Year of construction	SFH	estimated	MFH	estimated	kWh/m²a	EPC*	kWh/m²a	EPC*	...-1919	263	H	206	G	1919-1948	260	H	196	F	1949-1978	250	H	181	F	1979-1990	190	F	147	E	1991-2000	131	E	115	D	2001-2010	94	C	85	C	2010-...	36	A	47	A	Energy performance certificate with energy efficiency classes based on calculated final energy demand for residential buildings in Germany, according to EnEV 2014 / GEG 2020: 
Year of construction	SFH	estimated	MFH	estimated																																																				
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Site energy: Ø146.8 kWh/m²/a		CO ₂ -Intensity: Ø0.236 kgCO ₂ /kWh					*Estimation based on BMWI 2020 LTRS																																																	
		Building stock weighted reference benchmark: 34.6 kgCO ₂ /m²/a																																																						

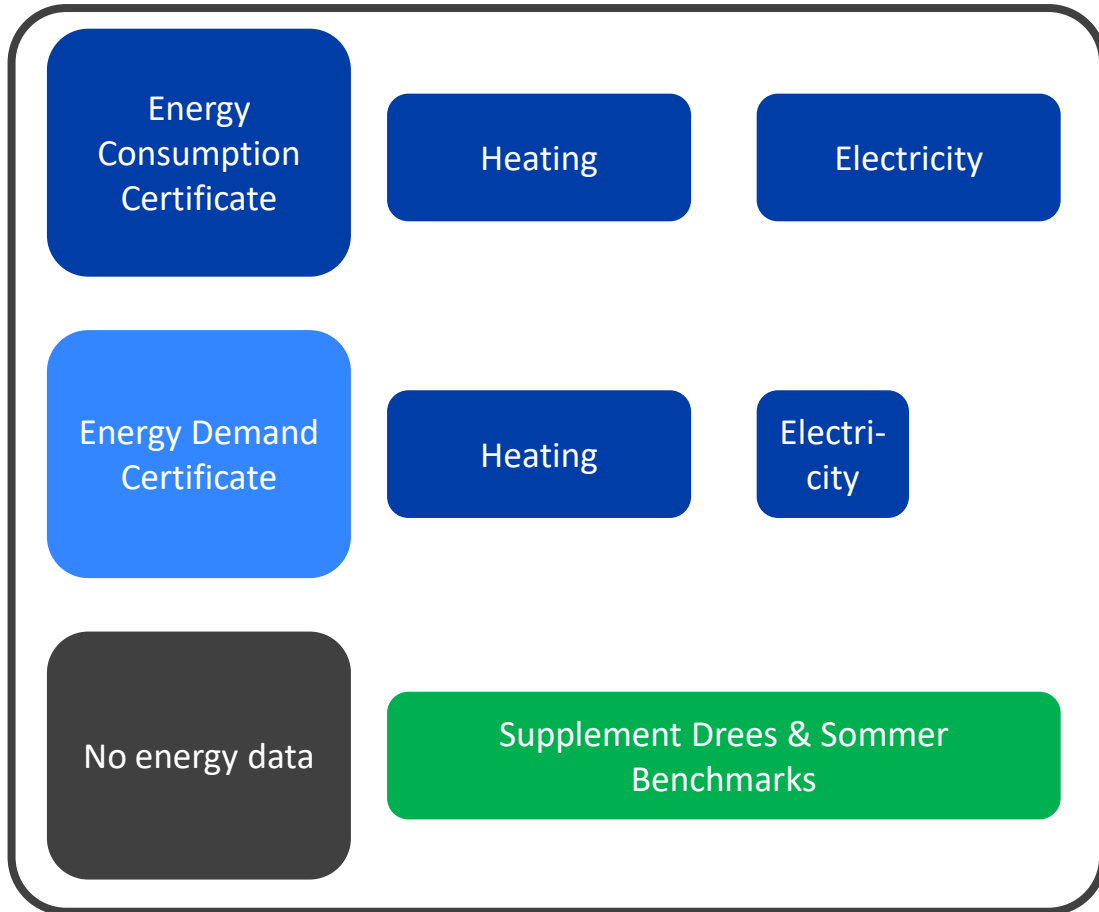
Drees & Sommer benchmarks for assets located in Germany. Status: January 2022. Operational carbon emissions cover scope 1 and scope 2 emissions, according to national scope.



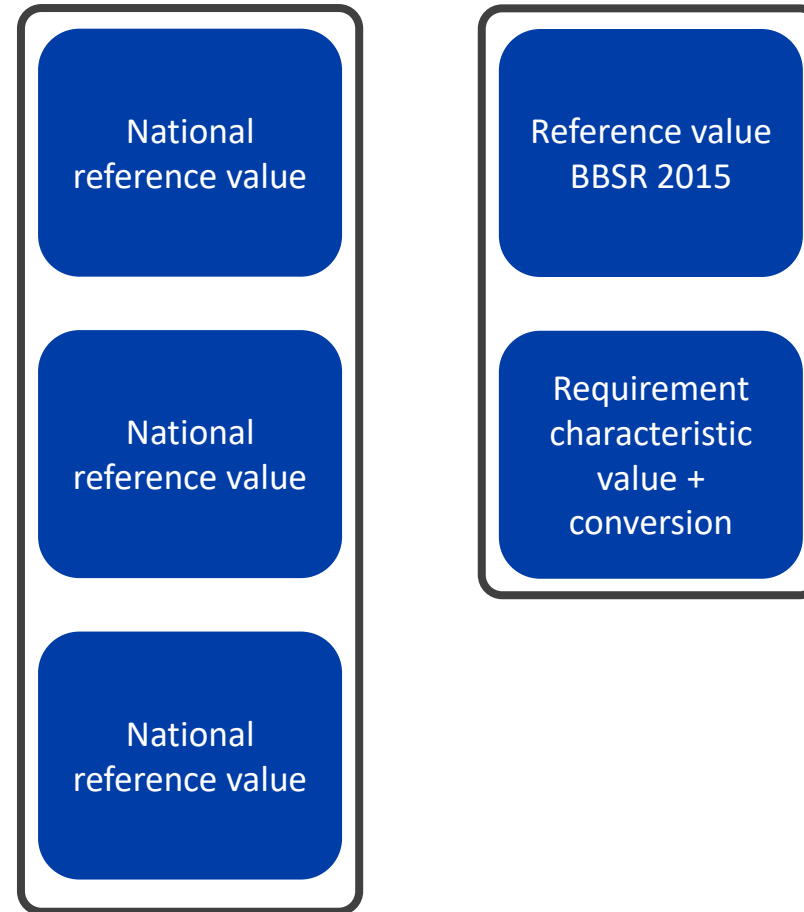
PORTFOLIO ASSESSMENT & IMPACT REPORTING

Process – Benchmarking & References

Building portfolio of the client



Basis for comparison to determine the impact (Energie & CO₂- determination)

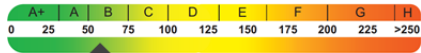




SUSTAINABLE FINANCE

Reference Benchmarks – Energy & Greenhouse Gases (CO2)

Top15%



Top 15%

Top 15%-Benchmark

- Final energy in kWh/m²a (or equivalent rating)
- CO₂-emissions in kgCO₂/m²a

Average Benchmark

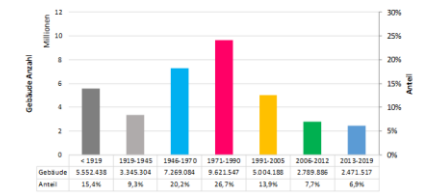


Reference value

National Benchmark – Average building stock

- Final energy in kWh/m²a (or equivalent rating)
- CO₂-emissions in kgCO₂/m²a

Detailed - Benchmarks



Detailed benchmarks per building age class/energy standard

- Final energy in kWh/m²a (or equivalent rating)
- CO₂-emissions in kgCO₂/m²a

Reference Benchmarks Energy & GHG



kWh
CO₂e



SUSTAINABLE FINANCE

Summary - Impact

Low Carbon Buildings	Year of Issuance	Type	Signed Amount ^a	Share of Total Portfolio Financing ^b	Eligibility for green bonds ^c	Annual final energy savings ^d	Annual CO2 emissions avoidance ^e
<i>Unit</i>	<i>[yyyy]</i>	<i>[-]</i>	<i>[EUR]</i>	<i>[%]</i>	<i>[%]</i>	<i>[MWh/year]</i>	<i>[tCO2/year]</i>
DZ HYP AG	2022	Low Carbon Building	2,001,056,306	100.0	100	251,029	75,986
Office	2022	Low Carbon Building	919,873,858	46.0	100	49,482	15,259
Residential			517,212,436	25.8	100	67,365	15,834
Trading			298,763,887	14.9	100	80,740	27,748
Logistics / Warehouse			105,973,714	5.3	100	43,753	12,849
Hotel			159,232,410	8.0	100	9,688	4,296

^a Legally committed signed amount by the issuer for the portfolio or portfolio components eligible for green bond financing.

^b Portion of the total portfolio cost that is financed by the issuer.

^c Portion of the total portfolio cost that is eligible for Green Bond.

^d Final energy savings calculated using the difference between the top 15% and the national building stock benchmarks

^e Greenhouse gas emissions avoidance determined by multiplying the final energy savings with the carbon emissions intensity

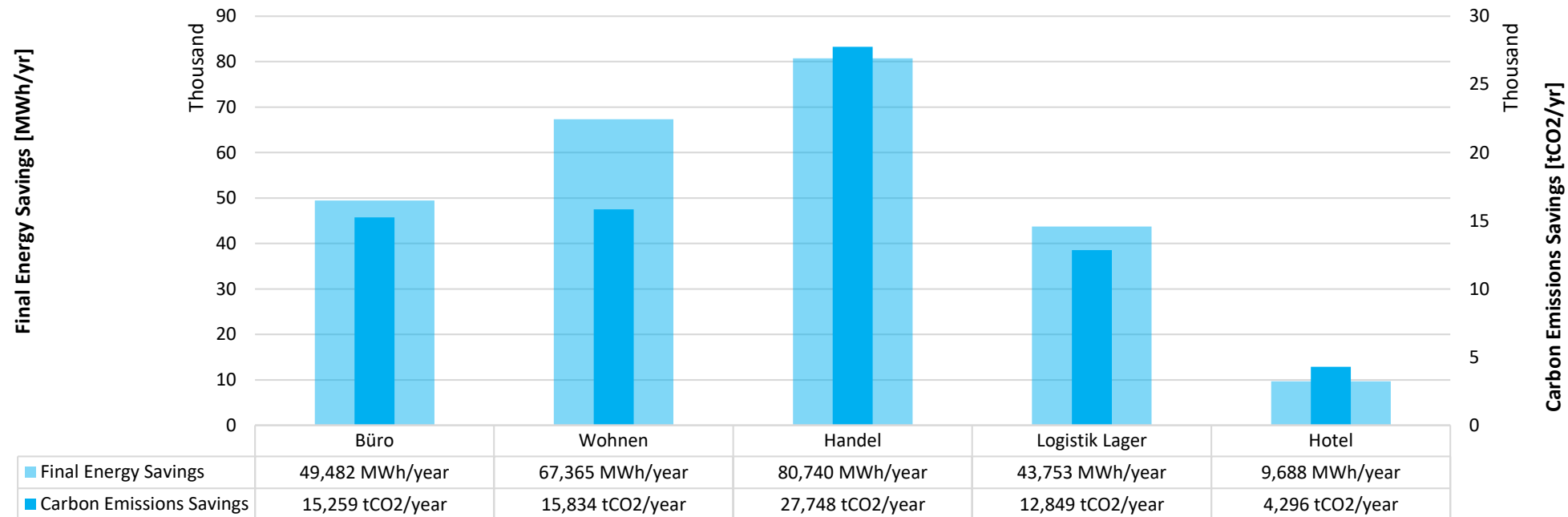


GREEN BOND

Impact Reporting 2022

Green Bond Portfolio:

- Buildings: 235
- Exposure: ≈2 bn EUR
- Energy savings: 251 029 MWh/year
- Carbon emissions savings: 75 986 tCO₂/year



SUCCESSFUL BUILDINGS

LIVEABLE CITIES

HIGH-YIELD PORTFOLIOS

POWERFUL INFRASTRUCTURE

FUTURE-ORIENTED CONSULTING



DREES &
SOMMER