What are the expected impacts on stakeholders in the Norwegian commercial real estate asset and capital market following the EU Taxonomy?

Candidates: 2125, 2200 & 2257

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Abstract

By studying the impact of current and future environmental requirements set forth by the European Union and concretized by means of the EU Taxonomy, this report has found important milestones in 2027, 2030 and 2050 where financial regulations for the commercial real estate industry will come into effect in the EU.

Combining document analysis and interviewing in-depth 12 different stakeholders in the industry, the study has seeked to get an understanding of the preparedness and willingness to change into more sustainable activities among the Norwegian market participants, as well as what the actual consequences will be.

The results are heavily dependent on the Norwegian government, playing a pivotal role in setting the stage for the many players operating inside and outside of the national borders, and by deciding how to interact with EU rules and regulations through the EEA agreement. For the market participants where “you become green when it pays off to become green”, it appears as big stick diplomacy will be required by politicians, leveraging the power of regulations and potentially shaking up entire financial ecosystems in the quest to combat climate change.

Complying fully and promptly with the EU directives and only providing loans to truly green assets, will enable a swift transition to a sustainable society, benefitting from the truly impressive €1 trillion pool of funding committed by the European Commission.

Contrary to initial assumptions on how differentiated interest levels would greatly benefit green buildings, the actual differences have currently proven to be insignificant with between 0,1 to 0,25% better rates. The real impact is being eligible for bank or bond loan at all, risking commercial real estates becoming de facto stranded assets.

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1. INTRODUCTION

1.1 Selecting a research topic

The European Union will cut CO2 emissions by at least 55% by 2030 and advocate for a shared, global commitment to a net-zero emissions pathway by 2050. (Von der Leyen, Twitter, 2021).

Estimated to account for around 30% of the global greenhouse gas emissions and consuming around 40% of global energy and raw materials; altering the framework within buildings and associated construction activities will be vital in reaching the ambitions goals set by the EU (RICS, 2005) (Eichholtz, P., Kok, N., Quigley, J. M., 2010, p. 2492-2509).

Starting in 2021, Norway has experienced soaring prices on its main source of energy; electricity, where the recent commissioning of two new power cables to Europe contributed to amplifying the price effect, instead of lowering the prices in the winter season when water level is low. (Fornybar Norge, 2022). Tenants in commercial real estate buildings have as a result encountered a spike in operational costs related to energy consumption, typically representing 30% of a company's total costs. (Augenstein, R. 2015). By preferring buildings with a high EPC, the valuation of a low EPC building is now likely to drop, despite earlier findings on the topic arguing the opposite. (Fuerst, F. & McAllister, P. 2011)

In addition to requiring a massive decrease in energy usage through upgrading non-residential and public buildings to minimum EPC (Energy Performance Certificate) rating D by 2030 (europarl.europa.eu, 2023), the EU has started the legal implementation of a scheme of hierarchical classification known as the EU Taxonomy to determine whether an economic activity is environmentally sustainable. Even though international law and Norwegian law are considered two separate legal systems with its dualistic legal system, Norway as part of the European Economic Area (EEA) follows close to all the same rules and regulations as the EU. (Regjeringen.no, 2021)

Investing in commercial real estate has long been regarded as an asset class with low risk, low volatility and a secure long term hedge for riskier assets such as corporate bonds and stocks.

Setting aside the housing bubble in 2008 caused by greed and speculation in securities with new types of financial vehicles such as Collateralized Debt Obligations, CDO, the main perception is still that real estate is close to equal as money in the bank (Geltner, D., Miller, N., Clayton, J. & Eichholtz, P., 2014). In combination with low interest rates for over a decade, “free” money has led many investors to take on extensive risk to date in the belief that the good times are here to last and that real estate continues to prove a low risk asset for a diversified portfolio (www.ecb.europa.eu, 2023).

As maintenance and operational costs no longer can be regarded as a minor percentage of the annual lease for the landlord, but needs to take into account heavy upgrading investments to meet future energy and environmental requirements, the divide between “brown” and “green” assets may lead investors, banks, brokers, insurance companies and several other stakeholders to rethink the possible financial ripple effects that may occur in the years leading up 2050.

1.2 Problem statement

By limiting the geographical location to Norway and focusing only on office buildings, this thesis aims to utilise a qualitative approach to discover if there are any significant discrepancies between current real estate valuation and an alternative valuation where future EU environmental related restrictions, fees, taxes, and higher cost of energy are taken into consideration.

Through semi structured interviews with different stakeholders on their perspectives, the thesis research questions are as follows:

RQ1: Are the commercial real estate players aware of the economic effects of the taxonomy?
RQ2: To what extent have the various actors prepared for the taxonomy?
RQ3: What are the impacts for real estate value & capital costs?

Leading to the overarching research questions;
What are the expected impacts on stakeholders in the Norwegian commercial real estate asset and capital market following the EU Taxonomy?

1.3 Motivation

Following the Genchi Genbutsu (現地現物) lean principle that can be translated to “real location, real thing”, it represents a “go and see” approach to truly understand an activity or situation. (Toyota, 2013)

From a financial standpoint; how strong is the herding effect within the commercial real estate industry with players fearing “the train leaving the platform” on apparently sweet deals and miscalculating risks potentially leading to stranded assets versus the lone contrarian taking time to research, analyse, decide and act. (Hilmersen, T. 2013, p.166)

And for environmental aspects; is there a genuine concern among individuals in the industry for the living qualities of future generations that influences recommendations being given or is “big stick diplomacy” the only remedy in making sufficient impact to reach a net zero society.

1.4 Thesis structure

The thesis first gives a brief presentation of relevant background information in chapter 2, before elaborating on applicable academic theories in chapter 3 including common denominators for commercial real estate valuation. Methodical approach is investigated in chapter 4, and gathered data are summarised and empirical results are analysed in chapter 5. Chapter 6 provides a conclusion of the different findings, followed by bibliography and appendices.

2. BACKGROUND AND LITERATURE

Valuing commercial real estate involves a complex set of mechanisms and factors that are used to determine the present and future value of a property. One important aspect of this process is commercial real estate certification, which can be used to verify the sustainability and energy efficiency of a building. BREEAM, EPC, and GRESB are commonly used certifications in the industry. In addition, the recently introduced EU taxonomy is used to classify and compare properties based on their environmental impact.

Financing real estate is a crucial aspect of the real estate industry and involves a variety of financial instruments and strategies. Common approaches are to secure a loan or multiple tranches of loans from a lender, which are typically structured with specific terms and conditions. Borrowers may also use interest rate swaps to exchange variable interest rates for fixed rates, or vice versa depending on risk preferences. Bonds are another financing option for real estate projects and are issued by the borrower as a form of debt.

Investment strategies in commercial real estate can vary depending on the investor's goals and risk appetite. Investors generally operate with Core, Core+, Value add and Opportunistic as the four types of investment approaches to align with their investment strategy and reflect their appetite for risk versus reward.

Finally, two key academic papers from NTNU and KTH School of Architecture exploring both environmental aspects within commercial real estate and on how the EU taxonomy has affected the Norwegian market, have been taken into consideration and updated to today's regime.

2.1 Commercial real estate in Norway

In Norway, the majority of commercial real estates are owned by local real estate actors followed closely by national real estate actors and the remaining piece of the pie is covered by pension funds, banks, real estate investment trusts (REITs) and others(fig. 1).

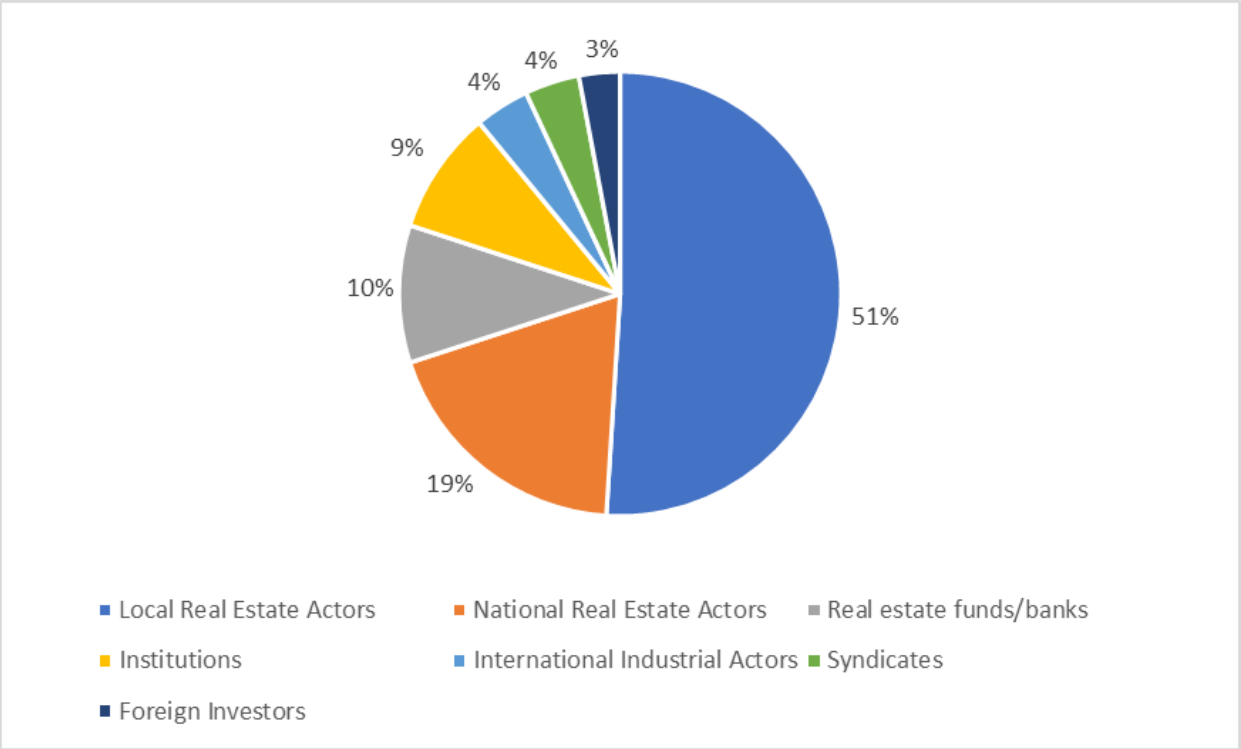

Figure 1: Estimated market value of commercial real estates divided by owner category (%) Modified from Norges Bank, 2022

Although local and national real estate actors have a significant ownership in all segments of commercial real estate, the majority is exposed to the trade segment. And even though syndicates are one of the smallest owner groups (3,7%), their share has increased by almost 50 percent from 2019 to 2022 and they are especially exposed to office buildings. For syndicates, an investment bank or other financial institution establishes a so-called Single Purpose Vehicle (SPV), a form of ownership where a company is created for one or more properties, where a smaller number of investors contribute with capital. (forbes.com, 2022)

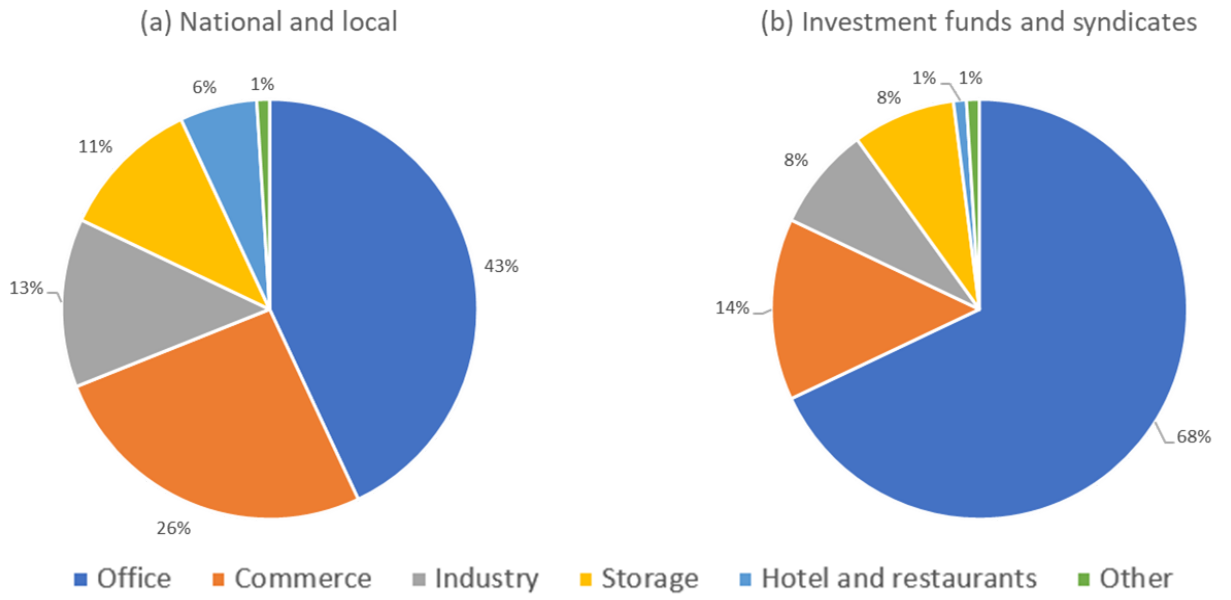

Figure 2: Estimated market value of commercial real estates divided by tenant category (%) Modified from Norges Bank, 2022

As can be seen in figure 2b, the majority of commercial real estate SPVs are created for investments in office buildings, whereas close to half of the local and national real estate actors.

2.2 Financing real estate

When undertaking a new real estate project such as a newbuild, purchase/transfer of ownership or renovating an existing asset, investors most likely need to secure short and/or long term funding, in a combination of equity and capital from an outside source. Institutional investors such as pension funds and insurance companies typically are 100% equity financed, but may seek to improve their profits (and increase risk) by leveraging on debt, as where the largest portion of the market players will need a certain degree of debt leverage to be able to compete.

As can be seen in figure 3, the far largest lender in the Norwegian business market is commercial real estate with 47% of the capital market.

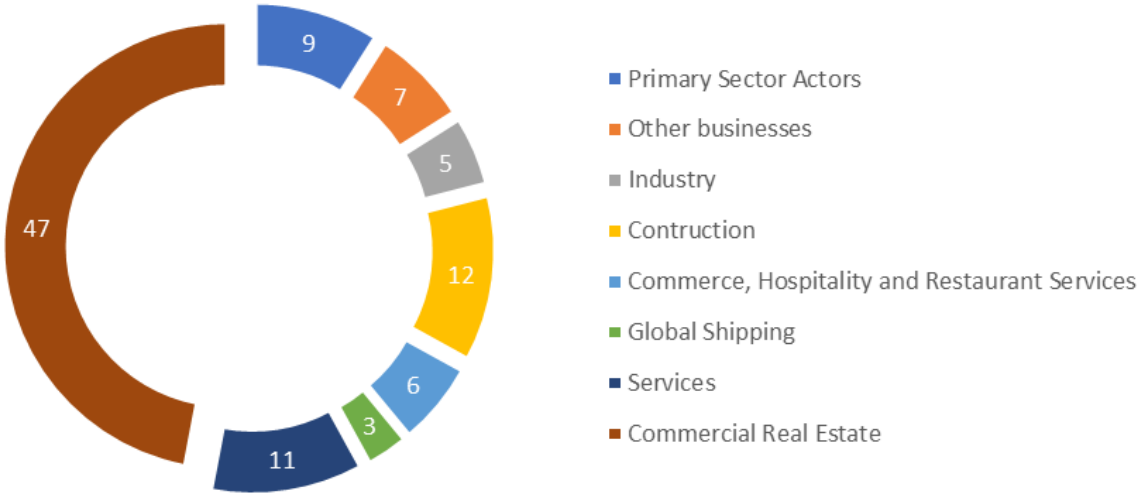

Figure 3: Lending to the Norwegian business market (%). Modified from Norges Bank, 2022

In 2022, there were approximately 850 billion NOK in loans to Norwegian commercial property, whereas around 80% or 680 BNOK is bank loans and 20% or 170 BNOK is real estate bonds (fig. 4). It is also worth noting that the outstanding volume in real estate bonds has increased tenfold in the last ten years. (Nystad, 2022).

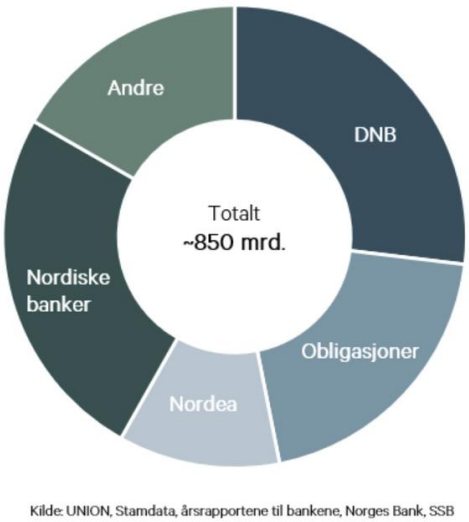

Figure 4: How is the Norwegian property sector financed. Source: Nystad, 2022

2.2.1 Loan & Tranches

In commercial real estate projects, financing plays a crucial role, with different stages requiring specific types of funding. Construction loans are typically short-term (1-3 years), while permanent commercial mortgages extend to five to ten years or longer. Construction loans have little interest rate risk but face higher default risk due to monthly payments and challenges in completing the project on time and budget. (Norges Bank, 2023).

Permanent loans, secured by fully operational properties, have lower default risk but are still affected by interest rate fluctuations (Gelter, 2013, p. 285). Local banks, with their short-term liabilities, provide financing during the construction phase, leveraging their local knowledge for risk reduction. In Norway, long-term commercial mortgages are often placed with the same credit institutions but follow a different approach than in the US. In the US, life insurance companies, pension funds, and GSEs serve longer-term commitments, while Norwegian real estate mortgages commonly consist of revolving loans with 3-5 years duration (Norges Bank, 2023). Additionally, property debt may be divided among multiple lenders in tranches, each with unique interest rates and seniority (Myers, M., 2021).

2.2.2 Interest Rate Swap

Swapping between fixed and floating interest rates allows counterparties to reduce interest rate risk and gain predictability (fig. 5). This exchange of cash flows offers advantages based on preferences and market conditions. If interest rates rise, the payer benefits from unchanged fixed rates, and the receiver owes them the difference between fixed and floating rates. Conversely, if rates drop, the receiver benefits from lower floating rates and receives the difference from the payer. Interest rate swaps provide access to fixed-rate markets, mitigate risk, and capitalise on expectations of rate fluctuations. Companies can use long-term swaps to secure rates during specific loan terms. In a typical swap, the customer pays a fixed rate (swap rate) to the bank, while the bank pays a variable rate (NIBOR-based market rate). Terminating a swap before the expiry date results in a settlement of gains or losses between parties. (DNB, 2023)

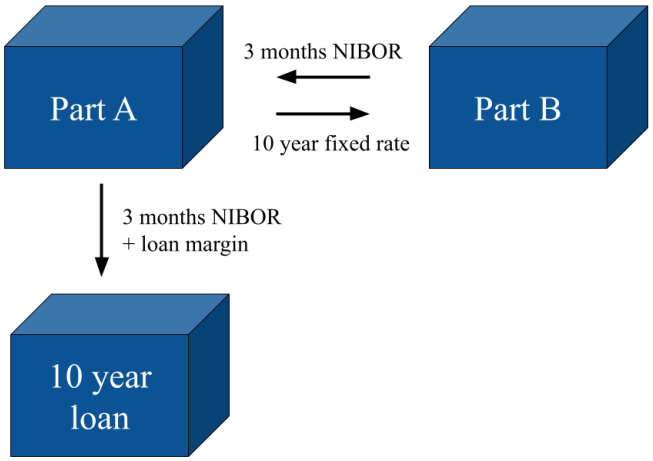

Figure 5. "Example using IR Swap", modified from Danske Bank, 2023.

2.2.3 Bonds

Bonds are financial instruments that allow organisations to raise capital for investments through interest payments and down payments. Unlike loans, bonds have fixed payment schedules called coupons, which are paid at regular intervals, with the full capital amount returned at maturity. The value of a bond is influenced by the issuer's credit quality, coupon rate, and remaining time until maturity. The ability to issue bonds is typically reserved for large corporations or nations due to the importance of credit quality.

The European Union has introduced the European Green Bond Standard (EUGBS), defining criteria for bonds to be recognized as green bonds, promoting sustainable investments in areas aligned with the EU taxonomy (ec.europa.eu, 2023). The EUGBS requires a minimum of 85% of funds raised to be used for taxonomy-aligned activities, reducing greenwashing risks. While green bonds have historically offered lower returns, investors have shown willingness to accept lower interest rates for the environmental benefits they provide. (Karpf and Mandel, 2017, Baker, Bergstresser, Serafeim & Wurgler, 2018), (Schiereck and Hachenberg, 2018, p. 371-383).

2.3 Taxonomy

Taxonomy is a term given to a scheme of hierarchical classification, wherein things are organised into groups or classes. The EU taxonomy for sustainable activities, is a form of green taxonomy, where the EU has set out to present a clear guideline and classification of sustainable buildings for the coming years.

The need for a taxonomy for sustainability is tied to the EU's goal to meet climate and energy targets for 2030, and the objectives outlined in the European Green Deal (Taxonomy Report 2020). The guidelines are based upon scientific principles and establishes six environmental objectives which the taxonomy will regulate (Taxonomy FAQ, 2021): These includes climate change mitigation, climate change adaptation, the sustainable use and protection of water and marine resources, the transition to a circular economy, pollution prevention and control and the protection and restoration of biodiversity and ecosystems.

Additionally, it also states four conditions that needs to be met for an economic activity to classify as taxonomy aligned: Making substantial contributions to one or more environmental objectives, do no significant harm to any of the other objectives, the activity needs to comply with social safeguards and technical screening criteria.

One of the main hurdles for different stakeholders has been on how to quantify "green" qualities in the construction and building process for valuation, tax and other purposes. In March 2018, the European Commission adopted the Action Plan on Financing sustainable growth. Among other actions, the Commission committed to establishing a clear and detailed EU classification system – or taxonomy – for sustainable activities which would create a common language for all actors in the financial system and to establish EU labels for green financial products.

In June 2018, the European Commission set up the Technical Expert Group on sustainable finance (TEG) to assist it in implementing the Action Plan, most notably by helping to develop a EU classification system – the so-called EU taxonomy – to determine whether an economic activity is environmentally sustainable, a EU Green Bond Standard, methodologies for EU climate benchmarks and ESG disclosures for benchmarks.

On the back of these appointments, the EU presented the Green Deal in 2019. The European Green Deal would flesh out policy initiatives for several environmental targets on the way to make Europe climate neutral by 2050. The plan includes 10 measures to stimulate green initiatives divided into 3 categories; Capital flows redirected into sustainable activities, sustainability included in risk assessment and demanding companies to report on their sustainability going forward.

The third point here is what is known as the Non-Financial Reporting Directive (NFRD) and has made it mandatory for banks to report their Green Asset Ratio (GAR). The GAR is the amount of sustainability aligned loans given out to publicly traded corporations over a certain size, who themselves must report GAR scores.

Due to the limited active involvement of banking institutions, the European Banking Federation has given additional reporting requirements. In summary, the extra conditions put it upon the banks determine which loans qualify for taxonomy alignment, provide customers with a self-assessment form focused on their main activity to help documentation, and provide large customers a way to collect data on all their activities (greenomy.io, 2023).

2.4 Classifications

2.4.1 Commercial building classification

Commercial building classification is a system that categorises buildings based on their use, occupancy, and structural characteristics. It ensures compliance with regulations, facilitates appropriate usage, and aids in market valuation. The Building Owners and Managers Association (BOMA) classification is commonly used, comprising Class A, B, and C buildings, representing varying levels of prestige, amenities, and condition. Factors such as age, construction type, finishes, accessibility, and location influence the classification. Energy efficiency classifications, such as the A-F grading system, assess a building's energy performance, enabling owners to identify improvements and buyers/renters to compare options. These classifications drive energy efficiency standards and incentives. (CBC, BOMA, 2023)

2.4.2 BREEAM

Building Research Establishment Environmental Assessment Method (BREEAM) is an international certification scheme that measures the sustainability performance of buildings. BREEAM considers the environmental, social, and economic impact of a building throughout its lifecycle, from design and construction to operation and eventual demolition.

2.4.3 EPC

Energy Performance Certificates (EPC) are official documents that provide information about the energy efficiency of a building. They are typically required when a property is sold, rented out, or constructed. EPCs are intended to help potential buyers, renters, and occupants make informed decisions about the energy performance and associated costs of a building.

The certificate contains information about the energy efficiency rating of the building, ranging from A (most efficient) to G (least efficient). It also includes recommendations for improving energy efficiency and reducing carbon emissions. The recommendations may suggest upgrades to insulation, heating systems, lighting, or other energy-consuming elements of the building.

2.4.4 Green Governmental Funding

In Norway, Enova SF is owned by the Ministry of Climate and Environment and was established in 2001 to contribute to the restructuring of energy use and energy production, a central instrument in the development of the low-emission society and the energy system of the future. Total grants to for 2022 was 5,7 BNOK (estimated to 1.054,- NOK per capita), where industrial recipients accounted for 1,8 BNOK (Enova, 2022)

2.5 Investment strategies

Return on any investment will require methodical due diligence, risk management and constant monitoring of market movements. Real estate private equity groups generally operate with Core, Core+, Value Add and Opportunistic as the four types of investment approaches to align with their investment strategy and reflect their appetite for risk versus reward (Episcope, M., 2018).

Although there are some variations on how investors categorise their real estate investments, we have illustrated average evaluation criterias in table 1, taken from Valiancecap.com.

Category	Property class	ROI	Leverage	Strategy
Core	A	6-10%	<35%	Stable cash flow, sell for gain
Core Plus	A & B	8-12%	30-60%+	Buy low quality, small improvements, sell for gain
Value-Add	B & C	12-17%	60-75%	Distressed/discounted real estate, fix/redesign, sell
Opportunistic	C	15-25%	70%+	More aggressive than Value-Add, higher risk

Table 1. Classification table of real estate investments. Sourced from Valiancecap.com.

2.6 Papers

2.6.1 Norwegian stakeholder's attitudes towards EU taxonomy (Norang, H., Støre-valen, M., Kvale, N., Temeljotov-Salaj, A., 2022)

The paper aims to examine how the EU taxonomy can affect the Norwegian construction industry, property owners and facilities management (FM) providers. Based on document analysis and interviews with main stakeholders within the financial sector, construction and real estate (RE) sector, authorities, environmental organisations and businesses related to FM and RE.

Focusing on the mere perception of the taxonomy especially for the Facility Management segment within the real estate industry, the paper finds largely similar attitudes among the different stakeholders. Concludes high levels of uncertainty and confusion associated with the taxonomy combined with concerns over lacking definitions and regulations on which the taxonomy is based, with less focus on the potential economic impact

2.6.2 The value of BREEAM certified buildings in Norway (Augenstein, 2015)

The paper argues how BREEAM certification increases the market value of a building due to factors such as demand from transaction market, image and internal value of the tenants, environmental requirements and less risk in terms of future regulatory requirements.

Written 3 years prior to the introduction of the EU Taxonomy, the paper offers an insight into how an environmental approach to commercial real estate can provide a net positive outcome on a property cashflow. It also reveals an early acknowledgment between stakeholders of the increased value following a BREEAM certification, and a deeper dive into how “green values” affect several factors such as rental prices, occupancy rate, general operational costs and risk premium in DCF calculations. Pursuing the “Other risk elements” in this paper and especially “Authority requirements and directives”, this thesis aims to build on these unknowns.

3. THEORY

Understanding the fundamental mechanisms of the real estate market is crucial for those looking to invest in it, and requires knowledge of various aspects including property law, mortgage underwriting practices, financial analysis, real estate development and capital markets.

3.1 Real estate market

As a Space and an Asset market, as well as a Development Industry to construct the necessary infrastructure, the Real Estate Market can be said to include both (fig. 6). Local and national economies make up the supply side within the Space market, and Capital markets are normally needed for funding development, construction and building upgrades. (Geltner, et al., 2014)

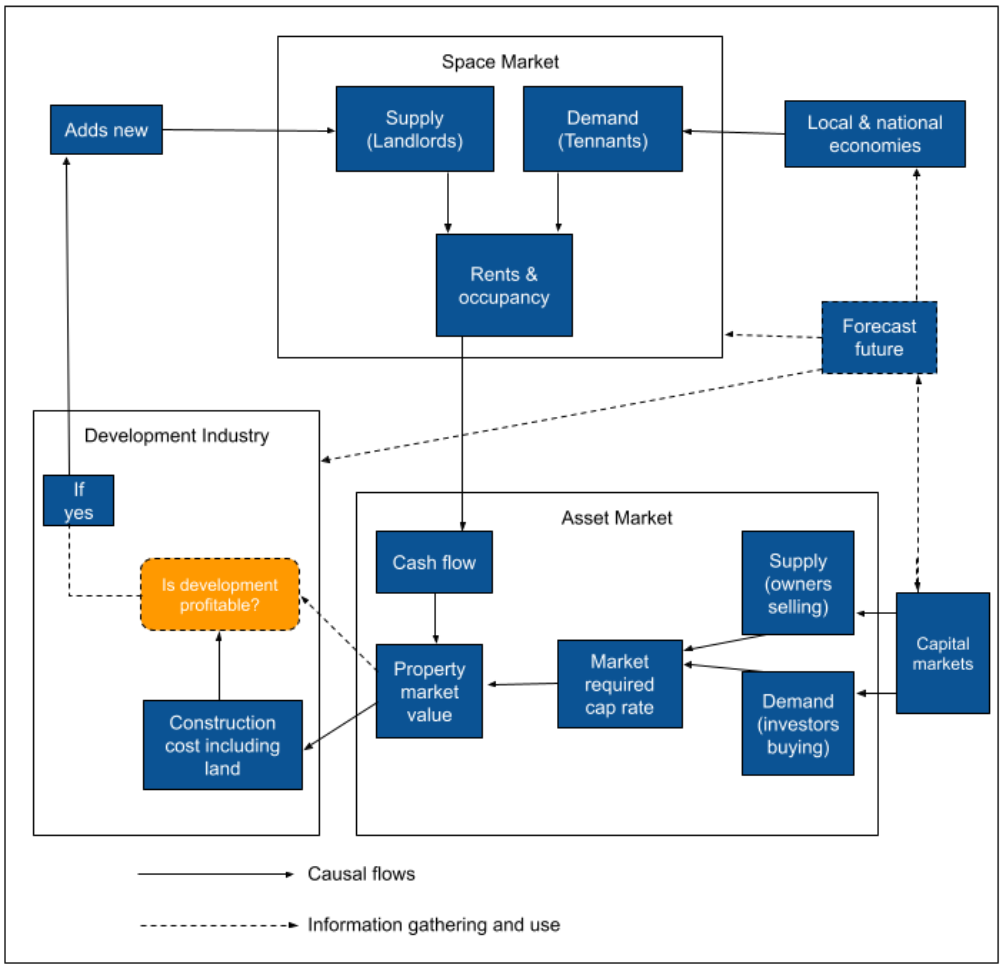

Figure 6. The Real Estate System, modified from Geltner 2013 page 27

To fully master the commercial real estate market, one must be able to understand property law, mortgage underwriting practices, mortgage insurance programs, financial analysis, valuation principles, income-tax laws, investment analysis, financial institutions, real estate development and capital markets (Brueggeman & Fisher, 2022).

Real estate has traditionally been popular to invest in, both for pure real estate investors and as part of a larger portfolio of other assets and as part of a diversification strategy. Traditionally, there has been a low correlation between the real estate market and the stock market, while real estate investments have provided good risk-adjusted returns compared to stocks and bonds. Historically, real estate investments have also performed well during periods of inflation risk. (Brueggemann & Fisher, 2022)

The real estate market can be simplified and illustrated through the following model. It is important to understand the fundamental mechanisms of the real estate market in order to connect this with the added value of green buildings.

In the rental market, the focus is on the use and utility of the property. On the supply side, there are building owners who want to rent out their buildings, while on the demand side, there are tenants who want to rent space to conduct their activities. In the rental market, factors such as geographic location, parking coverage, flexibility, energy consumption, indoor climate, and other physical attributes of the property are important. This leads to a segmentation in location and property type. Location divides the real estate market into different geographic markets, such as central business districts (CBDs), which are often highly attractive.

Another way to categorise real estate is by property type, such as development properties, industrial, hotels, retail, office, and residential. In this case, the rental price depends largely on the property's characteristics and utility.

While the rental market is more driven by the availability of rental space and the use of rental space, the owner market is driven by the capital market, i.e., access to and cost of capital as well

as the supply and demand for buildings in the transaction market. The required return largely depends on assessments of alternative investment opportunities.

One can argue that the required return is the expected return the capital market offers on investments with the same risk as the investment being considered.

In the real estate market, there are properties on the supply side that owners want to sell, and investors on the demand side who want to buy them. Investors are typically primarily interested in the cash flow that the property can generate. In this market, location is secondary. Another factor that greatly affects the value of the property is its growth potential.

Vacancies are also an important variable that affects supply, demand, and prices in the real estate market. Vacancy refers to the percentage of space that is not leased. A so-called natural vacancy is always present in the market, which depends, among other things, on location. In the CBDs, the natural vacancy will usually be lower than in more peripheral areas.

Sole purpose companies such as REITs (Real Estate Investment Fund) are typically only investing in larger cities, whereas real estate investors in general can be anything from a SME owning its own offices to a major hedge fund seeking to diversify its portfolio (Investor.gov, 2023) (Meisdal, 2023, Episode 46)

3.2 Valuation methods

Crucial for any asset transaction is a solid valuation with an anticipated economic trajectory based on how both macro and micro aspects develop over time. Although there is an increase in the use of computer based models in investment decisions, the majority of input is still made by humans and places affect at the centre of calculating the financial future. (Zaloom, C. 2009)

The following four methods of valuation are made up of variations of the same input and illustrate the potential pitfall in cases where lack of knowledge or personal biases may cause long term forecasting to diverge significantly from actual market development. For detailed information on valuation methods, *see Appendix E.*

3.2.2 Discounted Cash Flow Analysis (DCF)

The discounted value of future cash flows can be calculated using future cash flows at a discount rate of r and a calculation period of n. The discount rate consists of a risk-free rate plus a risk premium. Cash flows normally take into account contracted rental income, future assessed market rent, current and expected vacancy, ownership costs, and tenant adaptation costs. There are different practices regarding forecast period, valuation of residual value, and accuracy in payment timing and calculation of actual rental income.

3.2.2 Net Yield

A net yield calculation comprises the property's rental income, subtracted by annual ownership costs and divided by the property's value. The model does not take taxes into account, nor change in earnings or risk basis for the property and presupposes acquisition with equity only. Normally only looking at operating costs that do not include the investor's management costs, as these may vary from landlord to landlord. Costs for investments and upgrades, i.e. extraordinary costs, are also excluded from the calculation. (Malling, 2022)

3.2.3 Location-based pricing method

This method is based on gathering market data from the relevant area. The advantage is that it is based on direct market information and is perceived to be highly accurate. The disadvantage is that it requires good data, focusing less on actual asset.(Lind, H., Mandell, S. & Brunes, F., 2014)

3.2.4 The Production Cost Method

This method is rarely used but can be used where there is poor or no data or information on return. The method is considered difficult and is associated with some uncertainty and starts with an assessment of the value of the land based on evaluations of "highest or best use," site-pricing methods, or income methods. Thereby evaluating the construction costs of a new building. And reduced by an ageing factor to compare it with existing buildings. Ageing factors can be physical, functional, or changes in external conditions, before calculating the market value. (Lind et al., 2014)

4. METHODICAL APPROACH

There are two main types of investigating research questions; where “quantitative data operates with numbers and sizes, qualitative data operates with opinions. Opinions are mainly communicated via language and actions" (Jacobsen, 2015, p.123). Even though an econometric approach could prove useful to validate discounted cash flow analysis, the numerical values used in the financial models are entered by human beings with diverging opinions and biases.

Thus, contrary to following the most efficient ‘production line’ a quantitative approach will cater (Garland, 2008), taking a deliberate non-efficient approach in finding answers to the research questions avoids McDonaldization (i.e.excessive rationalisation) of the research topic, enabling an imaginative, deep dive into a field of research that requires both time and patience to learn and understand other people and their actions (Kvale & Brinkman, 2021, p.329).

4.1 Research design

Research design is a detailed plan for how to ensure that research objectives are reached (Grenness, 2001, p.102). Jacobsen distinguishes between three dimensions that can be used to analyse issues. A good understanding of the type of problem is important as the problem determines the research plan that should be used, and the method that should be used for collecting data (Jacobsen, 2015, p.78).

The first dimension distinguishes between unclear (exploratory) and clear (testing) problems. The exploratory aims to deepen something one knows little about before, while the testing aims to see the scope of a phenomenon (Jacobsen, 2015, p.80). The second dimension distinguishes between descriptive and explanatory problems. Descriptive problems are often based on describing differences and similarities at a given point in time, while explanatory problems, on the other hand, are about explaining why there are differences and similarities (Jacobsen, 2015, pp.82-83). The last dimension relates to the desire to generalise or not. To generalise means that one claims that findings based on a few respondents apply to everyone. When generalisation is not important, on the other hand, one concentrates on fewer units, and thus gets the opportunity to choose more intensive research plans (Jacobsen, 2015, pp.86-87).

The research group had little prior knowledge of the factors behind the EU taxonomy and the driving forces behind the commercial real estate industry, and the issue bears the stamp of an open question where it is not as easy to set clear hypotheses. There is therefore a need for a more exploratory problem. In order to get the opportunity to get more in-depth on such a problem, one must choose a method that requires concentration on a small number of informants. The method that is best suited for this is called qualitative data. (Jacobsen, 2015, p.133).

4.2 Choice of method and form of data collection

4.2.1 Form of data collection

There are four main methods of collecting qualitative data; interview, observation, document data and visual data (Mehmetoglu, 2004, p.67). Based on the purpose of the paper, several different qualitative forms of data collection have therefore been chosen; semi-structured video/ telephone interviews, document data and visual data. The interviews provide primary data, while the document data and the visual data provide secondary data.

The interviews were constructed to verify secondary data and give a closer insight into the preparedness, status quo and potential consequences of the EU Taxonomy among different stakeholders, but also revealed personal preferences and significant differences in market perceptions between actors with different roles in the commercial real estate eco system.

To secure a diverse group of respondents, the following 4 categories was selected for interview:

- Commercial Real Estate Bond Investors (CREBI)
- Commercial Real Estate Investors (CREI)
- Commercial Banks (CB)
- Investment Banks (IB)

In the selection of respondents, the informants were to represent each sector in the best possible way, thus selecting people working only or mostly on commercial real estate. A total of 12 in-depth interviews with between 30 and 60 minutes in duration were thus carried out.

The interviews add information that you will not be able to obtain through secondary data, as the data may be limited. The semi-structured interview format was chosen on the basis of flexibility. Here you get an opportunity to ask pre-determined questions as well as to ask follow-up questions if any other relevant findings for the task appear along the way (Mehmetoglu, 2004, pp.69-71). The interviews were conducted as video or telephone interviews on the basis that each individual must be heard, that misunderstandings must be cleared up continuously, and because the respondents are spread over a larger geographical area (Mehmetoglu, 2004, p.74-75).

Document data and visual data provide important and easily accessible information before the interviews. It gives the opportunity to familiarise yourself with the available information, before you can ask more in-depth questions during the interviews. Furthermore it can give an indication on the current perception of the topic at hand, and be used to validate if behaviour is consistent with what is being communicated. The secondary data have been obtained through academic literature, newspapers, various internet sites and company websites (Grenness, 2001, p.154-155). By using secondary data, one often does not know how the data has been collected, what information has been recorded, whether the information is complete and the relevance of the data (Grenness, 2001, p.156-157). Secondary data also leads to a risk of sources of error beyond our control. The data may be out of date, and the topicality may be weak (Jacobsen, 2015, p.171-172). In the application of visual data; podcasts and video clips of accessibility to the public have been used (Mehmetoglu, 2004, p.85-87).

4.3 Validity, reliability and generalisability

Validity is about whether a method is suitable for investigating what it is supposed to investigate, one looks in particular at the truth, correctness and strength of the research (Kvale & Brinkman, 2021, p.275-277). Reliability concerns how consistent, credible and reproducible the research's conclusions are (Mehmetoglu, 2004, p.143). Generalisability deals with the knowledge produced in a specific interview situation, and whether it can be transferred to other relevant situations.

The key here is whether there was a sufficient number of interviewees for the results to be generalisable and used to cover a larger segment. (Kvale & Brinkman, 2021, p.289-290).

In this research report, various forms of triangulation have been used to strengthen validity and reliability. Method triangulation has been used through the use of three different qualitative methods, these are combined due to their different strengths and weaknesses, equal results will lead to increased credibility. Data triangulation involves combining primary and secondary data, in this research report the interviews have provided primary data that supports the secondary data obtained using document data and visual data. Finally, researcher triangulation has been used in that both the primary and secondary data have been analysed and peer-reviewed by people within the research group, this in order to get a more holistic impression and more discussion around interpretations of the content. (Mehmetoglu, 2004, p.90-92).

An interview depends on the interviewer's practical skills and personal evaluations, and does not follow explicit steps in a rule bound method. To interview is to be regarded as a craftsmanship it takes years to master. (Kvale & Brinkman, 2021, p.36).

It was desirable to conduct face-to-face interviews with the different informants, this for better reading of the non-verbal reactions, better interaction, and more informal dialogue after the interviews, allowing time for feedback and suggested improvements (Jacobsen, 2015, p.147-149). However, this could not be carried out in the traditional sense as the respondents in most parts were located in Oslo. As a result, the interviews were therefore conducted using video meetings or over the telephone.

Interviews are very resource-intensive as they require both good pre-work and post-work. In advance, an interview guide was established which was followed during the interviews to prevent breaches of research ethical considerations. Too leading questions may have resulted in the answers from the respondents bearing the stamp of what they thought the interviewer wanted to hear, or that they simply did not dare to say what they actually meant (Kvale & Brinkman, 2021, p.201-202).

After the interviews, the research group was left with a lot of unclear and detailed information that had to be sifted out. However, important information may have already been unproven filtered out during transcription. This may have affected the complexity, and therefore the reliability. Based on the limited amount of time available with each respondent, one is also faced with a generalisation problem on the basis that the interviews that were conducted may not be representative. The best outcome might have been to conduct more and longer interviews to increase generalisation or to spend more time with the respondents during their daily work.

When collecting document data and visual data, new information has continuously come up that has aroused interest, this may have led to a lack of relevance in content, and has probably affected the validity of the thesis. It was desired that both the primary and secondary sources should be analysed by multiple researchers on the basis that information can be interpreted differently by different readers. In order to prevent too much misinformation, the focus has therefore been on being critical of sources and only retrieving and highlighting information that has been repeated from several different sources.

However, the weighting of document data output has been less weighted due to several factors such as company “greenwashing”, commonly understood as “to make people believe that your company is doing more to protect the environment than it really is” (Cambridge dictionary). Furthermore, a recent study on newspaper content on environmental topics revealed that there has been a shift away from alarming articles to greater climate optimism, despite constantly gloomy research reports on the actual development. (Paoletta, 2023, p. 24-31)

4.4 Constructing the Interview Guide

The foundation of this research interview include elements from behavioural finance, a discipline seeking to observe and inform of the many psychological phenomena that can occur when financial transactions are present, e.g. the significant difference between what people say versus what they do following an investment analysis or news story. (Appendix A). By obtaining extensive subject matter expertise prior to interviews and staying alert to psychological pitfalls before, during and after execution, results strengthen (Kvale & Brinkman, 2021, p.141).

4.4.1 Initiating conversation and sequencing topics

A semi structured interview is a dynamic tool that to a certain degree enables the interviewer to let the informant speak freely on the topic at hand, given that there is sufficient trust and openness between the parties. Introducing oneself with name and academic affiliation, highlighting the anonymous nature of the interview and speaking in a mild tone of voice to allow for an effortless dialogue between the two parties and an informed consent to proceed.

Defined to be a decision-makers view of the problem and possible outcomes, a decision frame is affected by the presentation mode, the individual's perception of the questions and personal characteristics. (Ackert & Deaves, 2010, p.84)

Starting with “technical” questions on business practices where personal beliefs are less prominent provides valuable insights on the status quo, before proceeding to more sensitive topics where actual actions speak louder than words. Green strategies usually look good on investor presentations, but how they are practised are of great importance as a possible proxy to how fast implementations will happen without governmental guidance.

4.4.2 Questions

The introductory questions are aimed at the upcoming EU Taxonomy and if the informants are aware of any direct consequences now or within the next 10 years, as there are concrete requirements coming into effect in e.g.2027 and 2030 that should be on the business radar. Followed by questions on classifications in general, where BREEAM, EPC and GRESB have a widespread adoption in Norway and Europe in general, but where there are uncertainties on how they are tied to financial aspects by the stakeholders.

Exploring the different and potential coinciding drivers for respective businesses are then investigated, where valuation methodology, LTV, interest rates and access to capital are some of the “nudges” given to informants to test their standpoint unless raised by themselves (Thaler, R.H., Sunstein, C.R., 2009). On the topic of “Green strategy” the informants are able to express how they perceive the importance of its daily compliance from an employee standpoint, before finally pivoting into their set of personal values on the same topic.

Means of transportation for business or pleasure, thoughts on food with low carbon footprint or personal energy efficiency measures are markers that can indicate whether they prefer a push or pull approach to change into more environmentally friendly habits. Although not a crucial part of information to answer the research questions, it has been deemed of interest to include in the process and test against personal preferences.

4.4.3 Debrief

At the end of what might be perceived as a stressful experience, informants were asked to rate the interview and after hearing a brief recap of the main input, asked to comment if anything should be left out or adjusted. No adjustments have been made and all informants have requested to receive a copy of the final report.

4.5 Research ethical considerations

In this research report, there have been specific guidelines when it comes to handling personal data. Personal data is any information that can be linked to a person. Whether background information makes a person identifiable depends on the recorded data, context, theme and the criteria for the selection. If there is a linking key that links information to one name, the information is considered personal data. (Appendix. A).

5. EMPIRICAL RESULTS

As a semi-structured interview, the interview guide was considered a flexible tool that would assist the interviewer in discovering answers to the research questions. By scheduling the interviews days in advance, the informants set aside sufficient time for answering questions on all relevant topics. The informants were divided into 4 categories:

Category	**Abbreviation**	**Characterisation**	**No.**
Commercial Real Estate Bond Investors	CREBI	Professional and/or institutional, long term bond investors	2
Commercial Real Estate Investors	CREI	Property investors with min.100k sqm office rental area	4
Commercial Banks	CB	Commercial banks and thrifts, publicly listed depository institutions.	4
Investment Banks	IB	Financial services company, intermediary in large and complex financial transactions including setting up SPVs.	4

Table 2. Overview of interviewees' stakeholder roles

5.1 Main findings

The following table 3 and radar chart (fig. 7) identifies the main standpoints from the interviews and reveals extensive differences between stakeholders on some areas, and a more uniform response on others (fig. 7 and 8). Most apart is believed to be the issue of maximising LTV, where commercial banks and commercial real estate bond investors are opposite to investment banks and investors. A detailed overview of the different interview responses can be in Appendix C - Interview Data.

	CB	IB	CREI	CREBI
Impact EU Taxonomy	3	2	1	1
Additional value BREEAM	2	1	1	1
Additional value for renters BREEAM	3	2	1	1
Problems obtaining capital	1	3	2	1
Willingness to maximise LTV	1	3	3	1
Extent of corporate green initiatives	3	1	2	1
Extent of personal green initiatives	1	1	1	1

Table 3. Summary statistics, scale from 1 to 3, where 1 is "little to none", 2 is "minor", and 3 is "major" importance.

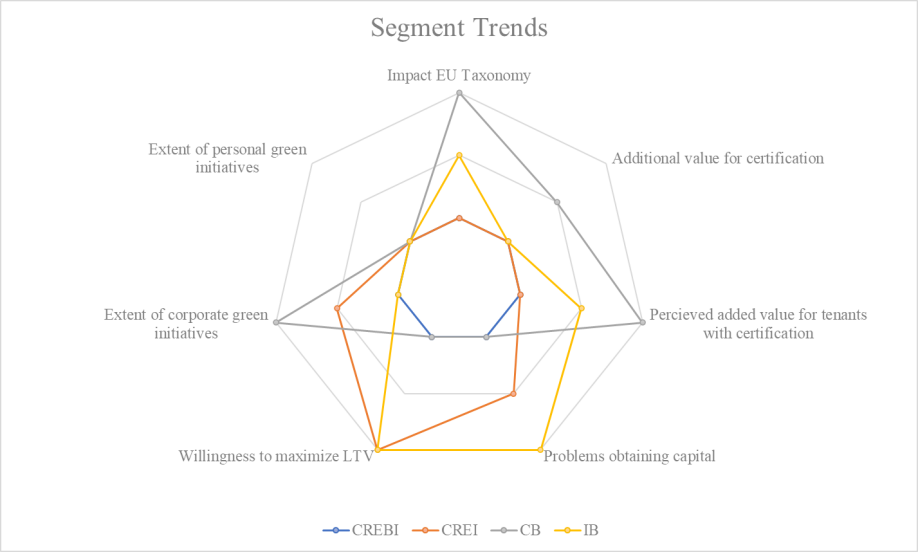

Figure 7. Radar chart displaying the segment trends discovered during the interviews.

By visualising a combined view on the topics discussed, the extent of personal green initiatives indicates that most efforts are perceived as "corporate level issues" and also a solid statement on how little additional value a certification scheme provides. Yet, there is a growing awareness of the financial impact that will occur as a result of the EU Taxonomy.

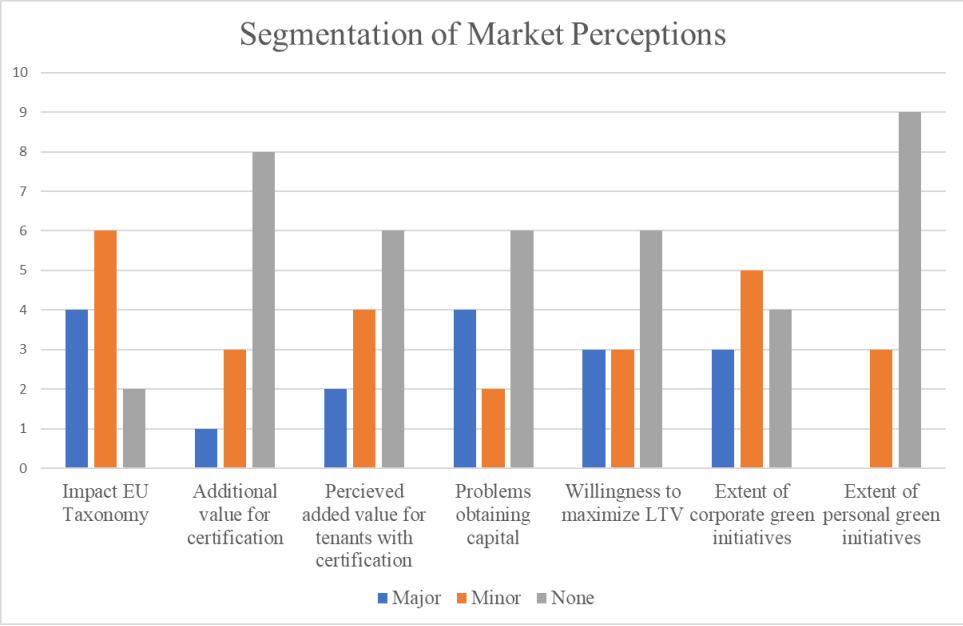

Figure 8. Segmentation of market perceptions discovered during the interviews. Cumulative responses from all participants.

5.2 Awareness of economic effects (RQ1)

The various interviewed stakeholders in the Norwegian commercial real estate market all have a general sense of what changes the new taxonomy will incur on their business. Although the majority of the respondents experience “little impact to date” (CREI2) and conform on there being currently “no direct impact outside of reporting” (CREBI1), most sense “ripple effects that will eventually affect the entire real estate supply chain” (CB4).

As discussed under article 3, the increased OPEX costs related to stricter EPC requirements starting in 2027 were thought to be a top priority for most if not all informants. Some regard their CBD assets to be of such high value that upgrading “cost not an issue” (CREI1) as they have a “long term horizon and will be profitable in the long run in any case (CREI1). Others plan an “increased focus down the road” (CB2), but remain aware of the fact that not complying with taxonomy related metrics may cause “no loan given” (CREBI2) and that the taxonomy is to be regarded as a “binary system where non compliant buildings will be pariah” (CB2).

5.3 Preparations for the EU taxonomy (RQ2)

5.3.1 Current measures

The banking sector, which will be hit first with orders to start reporting portfolio environmental impact (greenomy.io, 2023), are ahead of the pack. All respondents in our sample have made concrete steps to meet the criteria outlined by the EU, some going further than what is demanded of them. Every single CB in our survey has begun collection of emission data in their portfolio, and with that a reporting scheme that will eventually “ affect the entire real estate supply chain” (CB4).

For the investment banks the situation has not progressed as far. All companies surveyed are aware of the changes on the horizon, but not all have started implementing changes in-house. However, even if they have not yet made changes, the thought is that the EU is serious about these regulations and the industry must comply.

The commercial real estate investors surveyed are currently not feeling an effect of the taxonomy regulations, but there is a changing attitude towards sustainability and emission reduction from "being a hassle" (CREI1) to being a crucial part of commercial real estate.

5.3.2 Green strategy

Emerging from an increase in demand for ESG reporting, namely Environmental, Social Responsibility and Corporate Governance, a green strategy can be regarded as an enhanced focus on the Environmental aspects of a company. The practice of ESG investing began in the 1960s as socially responsible investing, with investors excluding stocks or entire industries from their portfolios based on business activities such as tobacco. (MSCI, 2023) As the environmental efforts in ESG classified companies have been criticised for being diluted over the years, the background for challenging informants on the green strategy topic is to detect potential discrepancies between website presentations and real life adaptation. (Pengepodden, 2022)

Commercial banks appear to have adopted the principles of the green movement (according to their respective websites) and would like to demonstrate their dedication to sustainability. However, despite their market friendly rhetoric, their actions may not be as unwavering as they appear to be.

The aspiration of achieving "zero emissions by 2050" (CB1) is coherent with the EU's objective, but it provides ample time to determine the means of realising this goal. Furthermore, mapping CO2 emissions in the portfolio by 2030 is easier said than done, as reducing emissions is a more formidable task. While balancing the portfolio may seem appealing, it is uncertain how much of their investments will be directed towards environmentally friendly initiatives (CB1).

The metric of one parking space per 62,5 employee could be an indicator that there are regulations on the amount of parking spaces allowed on the lot of the commercial building. One could assume this is to reduce car usage and to encourage the use of more environmentally friendly transport.

“Training advisers and sustainability specialists” (CB2) is a step in the right direction, their influence on the bank's overall strategy remains uncertain. While the notion of incorporating sustainability throughout the organisation is commendable, its execution and impact on the environment are uncertain. Additionally, while claiming to have a “zero-emission portfolio” (CB3) ahead of the European Union is noteworthy, the definition of “zero-emission” remains ambiguous.

Encouraging customers to adopt sustainability strategies and providing consultancy services is a positive step, but it may not be sufficient. Overall, while central banks have begun to take environmental concerns seriously, there is a substantial distance to cover in terms of employee attitude, tangible actions and actual environmental impact.

The concept of green strategy in commercial real estate has gained immense popularity in recent years due to increasing environmental concerns and customer demand for sustainable practices. In this context, investment banks have a crucial role to play in shaping the green strategy in commercial real estate.

One perspective suggests that the best green strategy is simply to do what the customer wants(IB1). While this approach aligns with the principle of customer orientation, it also assumes that customers have a clear and consistent understanding of what constitutes a green strategy. Unfortunately, this assumption is not always true, and investment banks must take a more nuanced approach to understand the varying preferences of their customers.

Another response acknowledges that investment banks should have had a better green strategy, given the increasing demand for sustainable practices by commercial banks(IB2). This perspective highlights the importance of integrating sustainable practices into real estate projects to secure funding and maintain a competitive edge. However, it also implies that investment banks may have been slow to recognize the significance of sustainability in their projects.

The suggestion of waste segregation and vegetarian meal practices in commercial real estate projects is an interesting perspective that aligns with the principles of waste reduction and

sustainable consumption(IB3). However, this can be looked at as the bare minimum of what is expected and is an “easy win” to be let off the hook on other endeavours a company might be involved in.

The final perspective asserts that good projects usually have a green profile, and investment banks should strive to enhance the environmental impact of their projects to attract customers. The responses provided by employees in this scenario reveal the complex and ambiguous nature of green strategy in commercial real estate investments.

In the context of commercial real estate investments, the importance of implementing a green strategy cannot be overstated. However, the responses provided by the investor regarding their green strategy are somewhat ambiguous and appear to lack a clear plan of action.

One respondent admits to not having a defined green strategy(CREI1), which suggests a lack of proactive measures towards sustainability. This reactive approach could lead to missed opportunities to reduce costs and improve the environmental performance of their buildings. Additionally, while the desire for energy-friendly branding(CREI2) is a step in the right direction, it alone does not constitute a comprehensive green strategy.

Another respondent expressed their interest in maintaining the value of their buildings(CREI1), which again indicates a reactive attitude unlike a progressive approach. While compliance with regulations is necessary, it is insufficient in achieving sustainability goals. Instead, a holistic approach that encompasses a range of sustainability measures, such as energy.efficient design and materials, renewable energy sources and sustainable practices, is necessary to maximise both environmental and financial benefits.

The responses provided by the investors highlight the need for a more comprehensive and proactive approach towards sustainability in commercial real estate investments. By developing a clear and actionable green strategy, investors can reduce costs, increase efficiency, and create long-term value for their buildings and tenants while contributing to a sustainable future.

5.4 Actual impacts (RQ3)

5.4.1 Capital availability

A clear discrepancy between the commercial banks and other stakeholders within the commercial real estate industry is highly visible with regards to capital availability. As commercial banks have “no major issues” (CB4) or do not have “any trouble raising capital” (CB2), the situation for investment banks is markedly opposite.

They report a “difficult market” (IB1) with “significantly reduced access to capital” (IB2) and where capital is “extremely difficult to raise” (IB3). Coinciding with rising interest rates from the European Central Bank (ECB) after more than a decade with little or even negative interest rates, and the winding down of the 2020 Governmental Bond Fund (Statens Obligasjonsfond 2020, an emergency fund aimed at supporting businesses in distress during the Covid-19 pandemic), the access to capital is “reduced considerably from 2021” (IB4) for all investment banks questioned. (ECB, 2023)

Also confirmed by statements on a “falling market with few transactions” (CREI1) in combination with a good proxy for the Norwegian commercial real estate market; the development of the publicly listed Entra ASA stock falling 54% from its peak at 229 NOK in August 2021 to 105 NOK (figure 9, Entra, 2023)

Figure 9. Entra ASA stock price, Nordnet.no

It appears that the market is still not in equilibrium as “buyers and sellers are both unsure of values” (CB1) as “seller keeps the price high and the buyer expects the price to fall” (IB3).

Awaiting “when the interest rate is stable, the valuations will come six months later” (CREI1), the most likely scenario is continued capital limitations for some time.

5.4.2 LTV variability

According to input from the informants, Loan-To-Value typically ranges from 50% to 65%, down from a 80% peak in 2019.

As an equity investor, you get to use "other people's money" to increase returns; money borrowed from depositors, bondholders, insurance policy-holders, or the national (Norges Bank) or european (ECB) government. As a result, capital markets have a tendency towards excessive use of leverage and toward "systemic" risk caused by interconnected chains of debt through which a failure in one part of the system can rapidly propagate to other parts at first seemingly remote.

Depending on LTV value, the leverage effect can be illustrated as an off-centre seesaw offering a different ride for each side (fig. 10). The person riding on the long-arm side (the above-average positive property equity investor) will bounce wildly up and down; the people on the short-arm side (the lenders) only bounce a little. In the case of a significant LTV increase, the person riding the long-arm side of the seesaw will crash onto the ground with devastating force. In real estate investment, excessive use of leverage is the main cause of excessive losses and bankruptcy. (Geltner et al., 2014, p.290).

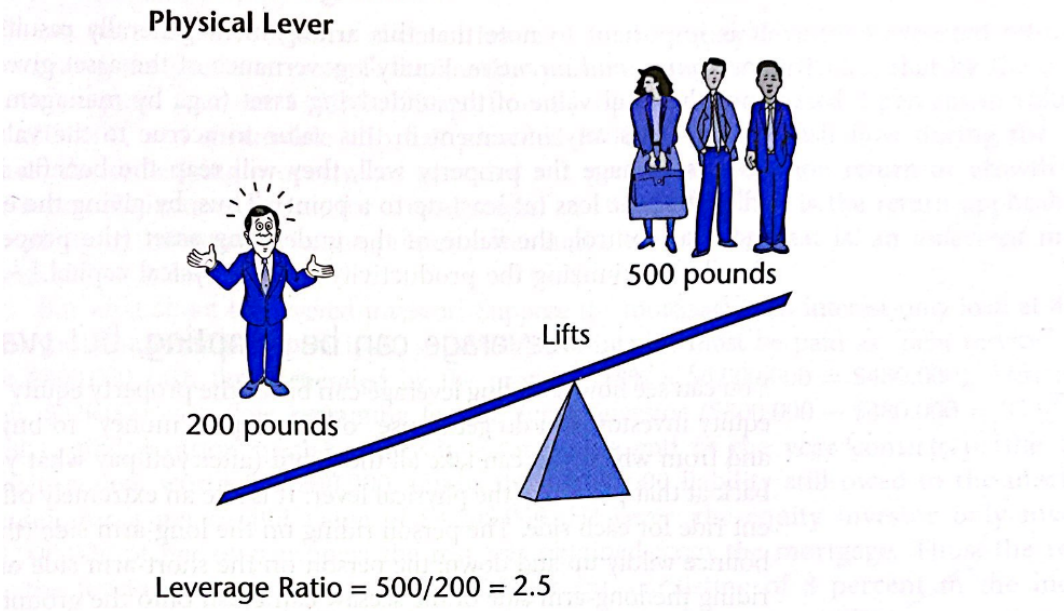

Figure 10. Simplified illustration of lever forces.

According to the informants, there are the following, main covenant levels on debt to date:

LTV	Covenant
< 50%	No instalments required, only interest payments (IB1)
> 60%	Instalments required (IB1)
< 70%	Still able to dividend payouts (CREBI1)
> 75%	Hard default, 20 day deadline to cure the breach (CREBI1)

Table 4, LTV and covenant levels

As stated under article 4 and confirmed by all informants, the two most common real estate valuation methods are discounted cash flow (DCF) and Net Yield. Using DCF, future income streams are discounted using a risk-free rate that includes a real interest rate plus expected inflation. With “Valuations lagging approx.6 months after interest has settled” (CREI1), current

LTV levels are regarded as highly uncertain and may prove to trigger new requirements on increased equity.

Neither ECB or Norges Bank appears to have plateaued on a desired interest rate level to combat the record high inflation in 2022, where EU annual inflation reached the highest level ever measured at 9.2%. Compared with 2021, when the annual value was 2.9%, it more than tripled. (Eurostat inflation, 2023)

With the investor default being “max LTV on projects” (CREI2) and “as high LTV as possible” (IB2), many regard the current situation as an “absolute challenge related to LTV" (IB4). Currently there is “totally 23 BNOK in defaulted real estate debt” (CREBI1) in Norway, a figure most likely to increase in the coming years when more assets value has “decreased considerably with higher interest rates" (IB4) plus increased severity for the “new projects that are struggling due to high gearing” (IB1).

5.4.3 Green loans and stranded assets

According to Norway's largest bank DNB, a green loan is a “financing product where the loan proceeds are used for projects and investments with specific environmental credentials.” (Green Loans - DNB, 2023). The very same bank announced in 2021 that they would allocate 130 BNOK to green property loans by 2025. (Wig, 2021)

In 2022, there were approximately NOK 850 billion in loans to Norwegian commercial property, whereas around 80% or 680 BNOK is bank loans and 20% or 170 BNOK is real estate bonds. So the amount committed to green loans by DNB alone gives a clear impression of the importance it will play in the years to come. (Nystad, 2022)

Although a substantial amount, the actual interest rate difference indicated between “green” and “brown” loans would merely be up to 10 basis points (0.1 per cent) lower at DNB. (Wig, 2021) During our interviews, several banks admitted that they are “unable to provide substantially better terms for green loans compared to ordinary loans” (CB1), with only “ 25 basis points

better" (CB3) and others "do not carry green loans as a service at this moment as he margins are just too low for us" (CB4).

Turning to the other side of the table, none of the commercial real estate investors and 3 out 4 investment banks does not make use of green loans to date, and only one can confirm that they "utilise green loans for new construction" (IB4).

Yet, as it appears, the real difference lies not within obtaining a lower interest rate in a green commercial real estate loan, but that "brown projects are more likely to get… no loans" (IB3).

Thus, the close to 500 commercial real estates in Norway rated as EPC G might become stranded assets or require heavy investments in less than 4 years.

An additional momentum is looking at the Norwegian market through EU lenses, and realising that what the EU taxonomy deems green is not necessarily coherent with current guidelines and standards in Norway. As the applicable building code TEK17 in Norway can be dated back to (national) NS 3031 Standard For Calculation Of Buildings' Energy Performance published in 2014, it is not harmonised with current EU regulations. (VKE, 2021)

Should ECB, where several of Norway's largest banks collect the majority of their funding, find the current documentation insufficient for green funding according to the EU Taxonomy framework despite having high EPC ratings, not having BREEAM certification may be a deal breaker causing upheaval with a significantly more rapid pace than Norwegian legislation.

5.5 Additional findings

5.5.1 Personal preferences

Based on the provided answers, it seems that the company does not have a strong focus on environmentally friendly practices or sustainability. Although there are recommendations to walk, bike or use other eco-friendly transport means, there is no indication that these

recommendations are followed or enforced. Additionally, there are no individual guidelines or requirements for employees to follow in order to promote green practices.

When asked if the taxonomy correlates with personal values, one of the answers where “we dont have any ", which suggests that the company does not have any specific green initiatives or programs in place. This could indicate a lack of interest or commitment to sustainability on the part of the company.

The answer “when it's profitable to be green, everyone will be green”(CREBI2) suggests that the company is primarily focused on profit and may only adopt environmentally friendly practices if they are financially beneficial. This perspective may be short-sighted, as environmental sustainability is increasingly important to customers, investors, and other stakeholders.

Overall, the culture within the company does not seem to prioritise environmental sustainability or encourage employees to be environmentally conscious. Without clear guidelines or incentives for green practices, it is unlikely that employees will take the initiative to adopt environmentally friendly behaviours. This lack of interest or commitment to sustainability may be a concern for stakeholders who value corporate social responsibility and environmental stewardship.

5.5.2 Solar energy

A believed to be significant discovery in the preparation phase of the thesis was the mandatory installation of rooftop Photovoltaic (PV) solar panels for all existing public and commercial buildings with useful floor area larger than 250 m² by 2027, according to a memo by the European Commission (EU Solar Energy Strategy, 2022). This was thought to represent an unknown, high cost that could spiral into an even higher expenditure for commercial real estate investors approaching 2027, as a possible ketchup effect could occur caused by players waiting until the very end to implement.

Although many informants report “ongoing projects” (CREI2) and that it is “beneficial for tenant, but a cost for landlord” (IB2), the takeaway was that the PV requirement is already about to be taken care of by “third party specialists” (IB1) and “self funded” (IB3). Companies such as

Entelios (owned by Statkraft together with several Norwegian municipalities) and Pareto Alternative Investments have already raised several hundred million NOK for single purpose solar funds to finance the construction of solar cell systems on commercial buildings. (Berglihn, 2022)

The interviews also revealed “below market interest rates” (CB2) for loans from the ECB to Norwegian banks if earmarked for solar projects, another indicator that the anticipated ketchup effect might only amount to a drop or two leading up to 2027.

5.5.3 Valuation methodology

In contradiction to the Financial Supervisory Authority report from 2010 where DCF is stated to be the most commonly used method for valuation, multiple interviews have revealed a large portion of players leaning towards Net Yield calculation. Commercial banks and investors report using “DCF for large assets and Net Yield for small assets” (CB1), but the common denominator for 3 out of 4 investment banks is Net Yield valuation.

By taking the property's rental income, subtract annual ownership costs and divide by the current net yield, the result is a historically based property valuation.

$$\text{Property Value} = \frac{Rental\ income - Property\ costs}{Net\ Yield}$$

A typical yield on property is between 3-8% annually, and one of the largest SPV portfolios reviewed with 25 properties has an 6,1% average (minimum 3.2% and maximum 9%) with median 6,2%. (Fearnley, 2022)

As the methodology requires that the property is acquired without loan, i.e. bought with equity only, the interest level heavily affects profitability for real estates with a high LTV. With a current policy rate at 3,25% growing steadily since September 2021, the available space between investors and whatever applicable mark up negotiated with commercial banks, is slowly shrinking and demanding higher and higher yield. (Policy Rate - Norges Bank, 2023)

Furthermore, regarded by some as to be “quite unexacting” (CREBI2) valuation method based mainly on historical data, it appears that there might be a discrepancy between projected property costs in yield calculation and knowledge on how stricter EPC requirements may affect OPEX by 2027 or 2030.

It is therefore reason to believe that some will experience an unpleasant wake up call in the next 4 to 7 years, especially properties with revolving loans up for renewal in 3 to 5 years.

5.5.4 The EU funding train

Over the next decade, the European Commission has pledged to mobilise at least €1 trillion in sustainable investments or 1.000.000.000.000 euro to include all twelve zeros. Converting to NOK means including yet another zero. Should Norway aim to continue with longer and longer implementation time on environmental directives and lacking alignment with the EU Taxonomy, the massive funding train put in motion by the EU may be out of cash long before it arrives terminus Norway (fig. 11).

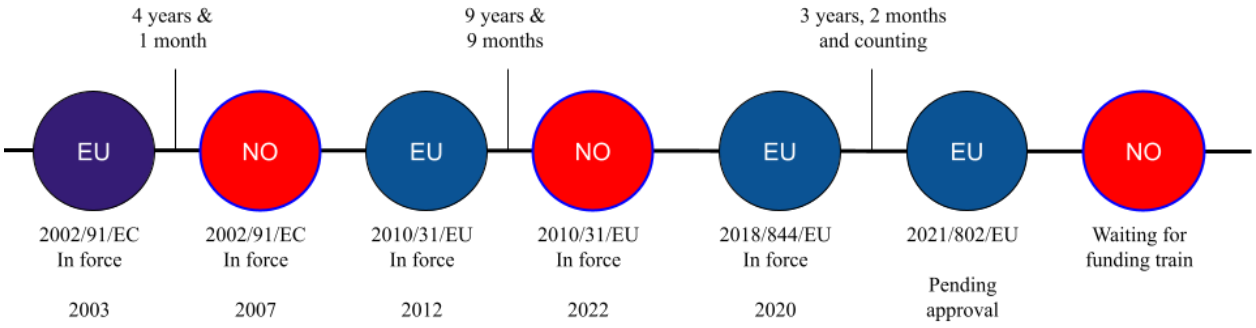

Figure 11, Illustration of implementation time on EU regulations in Norway

5.5.5 Academic literature

Two of the main academic books within commercial real estate originate from the US and used in this thesis, demonstrated little or no relationship between a building's environmental qualities and valuation. The most recent scientific book on commercial real estate finance was published

in 2021 without mentioning the topic, indicating a significant knowledge gap for current teachers and students. Although a valuation methodology including some green qualities is available in academic literature, this requires students to actively seek literature on the topic. (Lorenz & Lützkendorf, 2011)

6. CONCLUSION

This thesis has investigated how concretization of environmental parameters in the form of the EU taxonomy will impact the Norwegian stakeholders in the commercial real estate market.

The real estate industry is estimated to consume around 40% of global energy and raw material and accounts for around 30% of global greenhouse gas emissions. In order to transform the European Union into the first climate neutral continent by 2050, the European Commission has announced spending at least €1 trillion in sustainable investments and at the same time restricting non-sustainable activities, some with severe financial impact.

As a result, investors, banks, brokers, insurance companies, and other stakeholders may experience significant changes in market conditions leading up to 2050. And, as a part of the EEA, Norway is obligated to follow many of the same rules and regulations as the EU, but can choose to adjust, adopt, postpone or disregard certain directives if deemed fit.

For this study, the chosen qualitative methods include semi-structured video/telephone interviews, document data and visual data. To ensure a diverse group of respondents, the researchers selected individuals representing four categories: Commercial Real Estate Bond Investors (CREBI), Commercial Real Estate Investors (CREI), Commercial Banks (CB), and Investment Banks (IB). Each individual was chosen based on their primary involvement in commercial real estate.

A total of 12 in-depth interviews, ranging from 30 to 60 minutes in duration, were conducted. The semi-structured interview format was chosen for its flexibility, allowing the researchers to

ask predetermined questions and follow-up questions as necessary. The interviews were conducted via video or telephone to accommodate respondents' geographical locations.

Contrary to initial assumptions on how differentiated interest levels would greatly benefit green buildings, the actual differences have currently proven to be insignificant with between 0,1 to 0,25% better rates. The real impact is being eligible for bank or bond loan at all, risking becoming a de facto stranded asset. Forcing real estate owners to upgrade or rebuild properties will demand heavy investments worth several billion NOK in the years to come.

A possible systemic risk in this regard is related to failing to harmonise regulatory framework in EU and Norway respectively, potentially hindering ECB to provide green loans when the end borrower (i.e.real estate investor) is not able to comply with the EU taxonomy. Adding to that the significant latency when implementing EU directives, Norway may also miss out on green funding at better-than-market conditions.

The statement “You become green when it pays off to be green” from one of the informants implies bluntly that most businesses will continue to follow the road paved by Milton Friedman where “the social responsibility of business is to increase its profits” unless otherwise told so (Friedman, M. 1970). Although some may argue that the invisible hand of the market will be able to solve environmental issues as it is in individuals self-interest to survive as a species, the inability to comprehend the consequences for generations to come are more likely to be the case. (Smith, A., 1776)

Interviewing a limited number of people might cause a skewed perception of the topic at hand, although it allows for greater in depth knowledge compared to quantitative methods. To reduce these uncertainties, a larger dataset would be preferred and over a longer period of time. Furthermore, the Norwegian government might end up deterring or revising requirements set forth using the EU taxonomy, as well as reversing the European energy trade on hydropower. This will invalidate most or all of the future scenarios suggested by this thesis. However, as Europe is the single largest economy for Norwegian trade accounting for 64,2% of imports and 72,2% of exports, such a scenario is highly unlikely (Fagerli, 2023).

According to energy expert and Senior Fellow at the Manhattan Institute, Mark Mills, mankind does not have sufficient metals and minerals to reach the net zero goal in 2050. (SKAGEN Fondene, 2023) But as the recent EU taxonomy has shown, there are other ways to Rome than by converting the existing fossil fueled economy to a battery electric economy. Less consumption, less or other forms of transportation with home office or living closer to work, and less carbon intensive food are just some of the aspects that will assist in making a net zero society come true.

Although previously nearly impossible to quantify, more transparent supply chains now makes it possible for researchers to collect the necessary data, empowering politicians to make the right choices. And to paraphrase the well known former politician John F. Kennedy; “not because it is easy, but because it is hard”.

With regards to the financial market aspects of this thesis, the tendency seen in Sweden with 41 BUSD in outstanding real estate bond loans to be repaid in the next few years has gained international interest and deserves further research (Wilen, 2022). And as bad loans are made in good times, it is likely to happen again during the next decade of little or no interest (Marks, H. 2023). Knowing that the Norwegian bonds market in commercial real estate has increased tenfold in the last 10 years, and their share of total real estate loans has increased by almost 50 percent from 2019 to 2022, it is likely that Norway might be significantly more exposed during the next bull market.

Finally, finding correlations and causality among key drivers in the commercial real estate industry and environmental aspects might also pose potential for future research. As environmental requirements become hygiene factors, one might see a shift in investment strategies where valuation methodology takes into account a buildings BREEAM, EPC, Taxonomy or other classification. One variation of such a valuation including adjustment factors for green qualities is available, but not seen in mandatory, “mainstream” curriculum offered to current students in commercial real estate.

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APPENDICES

APPENDIX A - BEHAVIOURAL FINANCE DETAILS

Both document data and personal interviews have its limitations, where several psychological phenomena have been observed within the finance industry, resulting in a significant difference between what people say versus what they do. This may cause interference with the validity of interview responses and the following points are some of the key elements that have been considered when drafting and finalising the interview guide, and during the execution and interpretation of the interviews themselves.

Anchoring (Ackert & Deaves, 2010, p.98)

By avoiding listing concrete figures when discussing e.g.possible increased value for BREEAM certified buildings, the responses are not influenced by available “signals”. Also by being aware of any potential “nudges”, meaning defaulting a typical response when asked about current impact of the EU Taxonomy (e.g.”Most report that this will entail a lot of paperwork” as proved to be the case), there is a stronger confidence in outcomes from the responses (Thaler, R.H., Sunstein, C.R., 2009).

Certainty effect (Kahneman & Tversky, 1979)

As displayed in the research report “Norwegian stakeholders attitudes towards EU taxonomy” is that there are “high levels of uncertainty and confusion associated with the taxonomy” (Norang et.al, 2022). Since people are known to overestimate certain outcomes versus probable ones, a key observation was to identify if there were little or no concrete actions taken by the different stakeholders pending the final implementation of the EU Taxonomy in Norway.

Cognitive dissonance (Ackert & Deaves, 2010, p.84)

A situation where people are motivated to reduce or avoid psychological inconsistencies, often in order to promote a positive self-image, was likely to be present during the final part of the interview. At this point, the goal was to investigate any coherence between the “green” strategies implemented by their employer and the “level of green” in the informants' day-to-day lives.

Endowment effect / Status quo bias (Kahneman, Knetsch & Thaler,1999)

Following the rules of prospect theory where losses loom larger than gains, the value of a good will increase once a person owns it. Most stakeholders interviewed are third party providers of some sort (advisors and lenders), but the actual investors will with the endowment effect in mind have a different mindset on the valuation of their assets. Hence our selection process when choosing informants from commercial real estate investors (CREI), has been to be aware of the responses family offices and smaller entities might have with regards to valuation.

Framing (Ackert & Deaves, 2010, p.84)

Defined to be a decision-makers view of the problem and possible outcomes, a decision frame is affected by presentation mode, the individual's perception of the questions and personal characteristics. Being able to see your counterpart in the eyes, being well dressed, humble and patient when waiting for answers, as well as making sure the questions are not negatively or positively "charged" are all building blocks of what constitutes a professional research interview.

Groupthink (Janis, 1982, p.197)

Regarded as an extreme form of conformity, groupthink may cause people to ignore relevant information and cause disastrous consequences such as the Columbia explosion at NASA. An expert panel warned NASA about safety problems for the Columbia shuttle, but instead of ordering repairs, decided to remove several members of the expert panel and launched the shuttle leading to a fatal disaster for all seven crew members.

After the different stakeholders have spent years of attending similar conferences, working with similar assets and meeting similar people, the possibility of groupthink is definitely likely within the commercial real estate industry. The thesis aims to detect some, if any, strong and joint perceptions or suppression of facts that may cause a significant impact in the coming decades.

APPENDIX B - BUILDING CLASSIFICATION DETAILS

BREEAM:

Building Research Establishment Environmental Assessment Method (BREEAM) is an international certification scheme that measures the sustainability performance of buildings. It was created in the UK in 1990 by the Building Research Establishment (BRE) and has since expanded to over 80 countries.

BREEAM considers the environmental, social, and economic impact of a building throughout its lifecycle, from design and construction to operation and eventual demolition. The certification process evaluates a range of criteria, including energy and water use, indoor air quality, waste management, transportation, and materials selection. The certification process is designed to encourage sustainable practices and innovation in building design and construction. It provides a benchmark for assessing the sustainability of new and existing buildings and helps developers, architects, and contractors to identify areas where they can improve the environmental performance of their projects.

BREEAM assessments are carried out by licensed assessors who are trained to evaluate buildings against the BREEAM criteria. The certification process involves a detailed assessment of the building's design, construction, and operation, as well as an on-site inspection to ensure that the building is being used in a sustainable manner. The certification is available at various levels, including Pass, Good, Very Good, Excellent, and Outstanding, with each level representing a higher level of sustainability performance. Buildings that achieve BREEAM certification demonstrate a commitment to sustainability and environmental responsibility, which can provide a competitive advantage in the real estate market and help to attract environmentally conscious tenants.

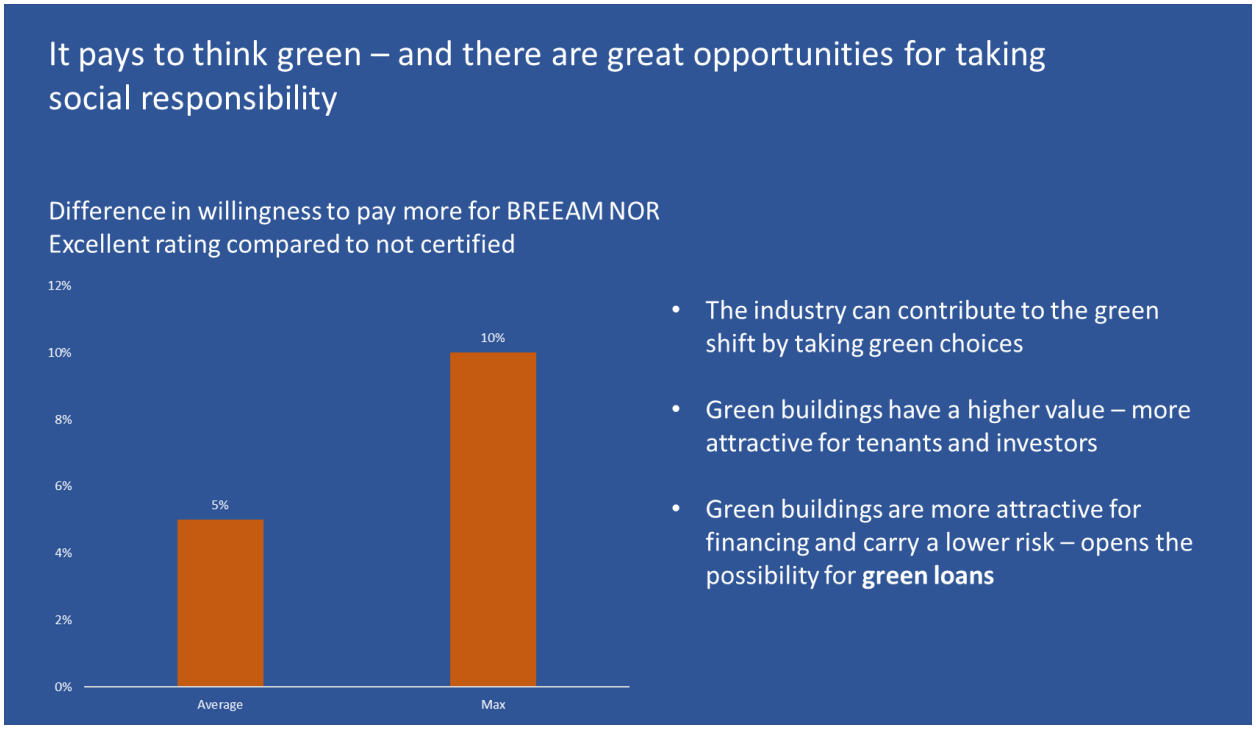

Figure B1, Results from 62 Property investors in 4 larger cities. Source: (Røed, M.M. Personal communication, 2023 april 26th)

BREEAM certification is widely recognized as one of the most comprehensive and respected sustainability certification schemes for buildings. It is used by governments, developers, and building owners around the world to demonstrate their commitment to sustainable development and to promote sustainable building practices. It has been instrumental in driving sustainable building practices and has helped to raise awareness of the importance of sustainability in the construction industry. It has encouraged the development of innovative technologies and materials that reduce the environmental impact of buildings and has helped to promote a more sustainable built environment.

In conclusion, BREEAM certification provides a benchmark for assessing the sustainability performance of buildings and helps to promote sustainable practices in the construction industry. It is a comprehensive and respected certification scheme that has helped to raise awareness of the importance of sustainability in building design and construction. Buildings that achieve BREEAM certification demonstrate a commitment to sustainability and environmental

responsibility, which can provide a competitive advantage in the real estate market and help to attract environmentally conscious tenants. (Proptechos, Grønn Byggallianse, 2023)

EPC:

Energy Performance Certificates (EPC) are a rating scheme to summarise the energy efficiency of buildings and are regulated by the European Directive on the Energy Performance of Buildings (EPBD) in the European Union. Directive 2002/91/EC was the first version of EPBD and was approved on 16 December 2002 and entered into force on 4 January 2003 with member states having to comply within three years of the Directive inception date (i.e. 4 January 2006).

The directive consisted of the following four main elements:

- Common method for calculating buildings' energy use
- Defined national energy requirements for new buildings and buildings being renovated, given certain exceptions
- Introduction of an energy certificate for new and existing buildings that shows how energy efficient buildings are, seen in relation to the energy requirements mentioned above. The energy certificate must contain recommended measures. For public buildings and buildings in public use, the energy certificates must be made visible.
- Periodic inspection of air conditioning (cooling and ventilation systems) over 12 kW and heating systems over 20 kW with regard to energy efficiency.

An obtained certificate is valid for 10 years, and every building must be recertified upon expiration. In the event of changes made to building- and sustainability standards since last certification the rating of the building might be degraded.

Compliance requirements included bringing into force administrative provisions, necessary laws, and regulations. Norway's EEA Joint Committee adopted the directive 23 April 2004 subject to the consent from the Norwegian Parliament (Stortinget). Stortinget decided to agree with the EEA Committee's decision on 30 November 2004 and the directive entered into force 1 February 2007 (Europalov, 2023).

Building categories	Delivered energy per m² heated Gross Area (kWh / m²)						
	A	B	C	D	E	F	G
	Equal to or lower	Equal to or lower	Equal to or lower	Equal to or lower	Equal to or lower	Equal to or lower	No limit
Office buildings	90	115	145	180	220	275	>F

Figure B2, Norwegian energy rating scale, Modified from ENOVA(2015).

In March 2007, The European Council (EUCO), often referred to as the "EU Summit", emphasised the need to increase energy efficiency in order to achieve the objective of reducing energy consumption by 20% in the EU by 2020. EUCO is the EU´s assembly of national heads of state or government, the Council's own president, as well as the president of the European Commission.

A formal proposal for a stricter rework of Directive 2002/91/EC on the energy performance of buildings with potential substantial financial consequences was presented by the European Commission on 13 November 2008. After presenting the matter to the European Council and the European Parliament (EP) followed by subsequent negotiations, an informal agreement was reached on 17 November 2009. The directive 2010/31/EU was then adopted by the Council and EP on 19 May 2010 and effective in the EU from 9 July 2012.

Compared to the 2002 directive, the revised directive contains a number of provisions that have been strengthened or expanded. Below are some examples:

- Strengthening of several provisions relating to energy requirements in buildings, where building elements and technical systems are also covered by energy requirements. The directive requires that new buildings after 31 December 2020 be "nearly zero-energy buildings", and there is also a requirement for the design of an action plan to increase the number of such buildings.
- A specific definition is given of what constitutes a major rehabilitation and thus which existing buildings will be subject to energy requirements.

- Cost optimality as a principle in calculations and assessments is emphasised in several provisions. The underlying cost-optimality regulation provides a detailed framework for how cost-optimal minimum requirements are to be determined.
- Several provisions on energy labelling have been tightened, i.a. the minimum area for the obligation to have a visible energy certificate is reduced.
- The directive requires independent control of energy certificates and inspection reports.
- The directive requires regular reporting in several of the directive's areas.

Norway's official position was that the building energy directive was in the border area for what must be incorporated into the EEA agreement, but decided to incorporate the Building Energy Directive into the EEA Agreement with necessary adaptations. The EEA committee draft was finally sent to the EU 5 June 2020 and adopted in Norway 29 April 2022. (Europalov, 2023)

In order to validate the necessary policies in place and investigate further enhancements, the European Commission performed an assessment of impact in 2016 where a consortium led by E3MLab hosted at the National Technical University of Athens (NTUA), and including the International Institute for Applied System Analysis (IIASA), prepared two core policies; EUCO27 and EUCO30, designed to achieve the 2030 targets as agreed by the European Council.

<table>
<tr><th>Targets</th><th>Scenario</th></tr>
<tr><td>EU 2020 Targets
GHG emission reduction: 20%
Renewable energy share (RES): 20%
Energy efficiency improvements: 20%</td><td>Ref.2016: Takes into account policies until 2015, it assumes that 2020 targets are achieved. Beyond 2020, no additional RES targets are set, no additional policy support is modelled. The EU 2030 targets are not achieved.</td></tr>
<tr><td>EU 2030 Targets
GHG emission reduction: 40%
Renewable energy share: 27%
Energy efficiency improvements: 27%</td><td rowspan="2">EUCO27, EUCO30, EUCO+33, EUCO+35, EUCO+40: A set of scenarios of increasing stringency that achieve the EU 2030 targets, with different margins and pathways. The scenarios assume a range of policies including: revised EU ETS; policies facilitating renewables</td></tr>
<tr><td>EU 2050 Targets
GHG emission reduction: at least 80%</td></tr>
</table>

• Renewable energy share: at least 80% in electricity • Energy efficiency improvements: no quantitative target	energy targets in the electricity, heating & cooling and transport sectors; energy efficiency policies in the buildings sector via e.g. increasing the rate of renovation, facilitating access to capital for investment in thermal renovation of buildings; ecodesign standards banning the least efficient technologies.

Table B1. EU Targets, Reference scenario and EUCO scenarios

Next, a proposal to revise the Energy Efficiency Directive was published in November 2016, eventually leading the European Commission to set up a Technical Expert Group on sustainable finance (TEG) in June 2018 to assist it in reaching its goals. One of the outcomes of the TEG is the so-called EU Taxonomy, an EU classification system to determine whether an economic activity is environmentally sustainable. (Energy EC, 2023)

In parallel with the TEG initiative, a minor revision amending Directive 2010/31/EU on the energy performance of buildings and Directive 2012/27/EU on energy efficiency was approved May 2019 and effective in the EU from March 2020. Amendment directive 2018/844/EU contained new definitions, EV charging requirements for new buildings and minor revision of previous provisions based on experience with the previous directives. To date, Norway and the EEA committee are still discussing the relevance of the directive. (Europalov, 2023)

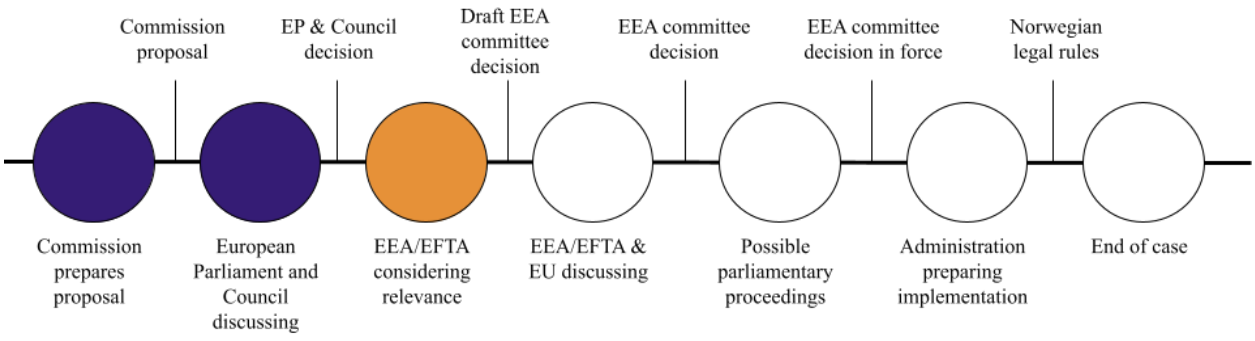

Figure B3, EEA Process for 2018/844/EU with current status for Norway

As part of the effort on investigating the financial impact of the EU Financial Taxonomy and whether the rate of environmental adaptation is happening according to plan, the European Commission Joint Research Center (JRC) performed another study in 2019. The outcome of the study resulted in a desire to increase the stringency of the environmental policies and on the 15 December 2021, the European Commission proposed a revision (2021/802) of the existing 2010/31/EU directive as one of several measures in the "Fit for 55" package under the EU's Green Deal and Renovation Wave with the goal of a higher rate of rehabilitation in the building stock.

In addition to the focus on energy efficiency of the building stock from the previous directive, one of the proposal's primary purposes is to reduce greenhouse gas emissions from the EU's building stock and thereby contribute to meeting the EU's climate target of at least a 55 percent reduction in greenhouse gas emissions in 2030 and climate neutrality in 2050.

The European Commission takes in this proposal the first step towards reducing buildings' greenhouse gas emissions over their entire life cycle. Here both the building's direct emissions as well as emissions from production, transport and recycling of the materials must be included. The requirement applies to new buildings with over 2,000 m² of useful floor area, from 1 January 2027, and is extended to all new buildings from 1 January 2030. The calculation must be done in accordance with a European standard and the result must be shown in the building's energy certificate.

The proposal involves a step-by-step phasing in of requirements that buildings with the worst energy performance (initially energy label G on the national label scale) must improve their energy performance. This means that all publicly owned buildings, and all commercial buildings, must have achieved at least energy label F in 2027 and E in 2030. Residential buildings must achieve energy labels F and E by 2030 and 2033 respectively. In addition, the member states, through the action plan for rehabilitation, must prepare a plan for how the buildings will achieve even better energy labels by 2040 and 2050. The aim is for the entire building mass to be zero-emission buildings by 2050.

Finally, the proposal expands the provision on financial incentives in the current building energy directive. It is proposed that the member states must in the future provide suitable financing, assistance and other mechanisms to counteract market barriers and stimulate necessary energy rehabilitation in line with the action plans for rehabilitation. It is particularly suggested that the member states should provide loans for energy-efficient building rehabilitation, and other financial instruments. (Europalov, 2023)

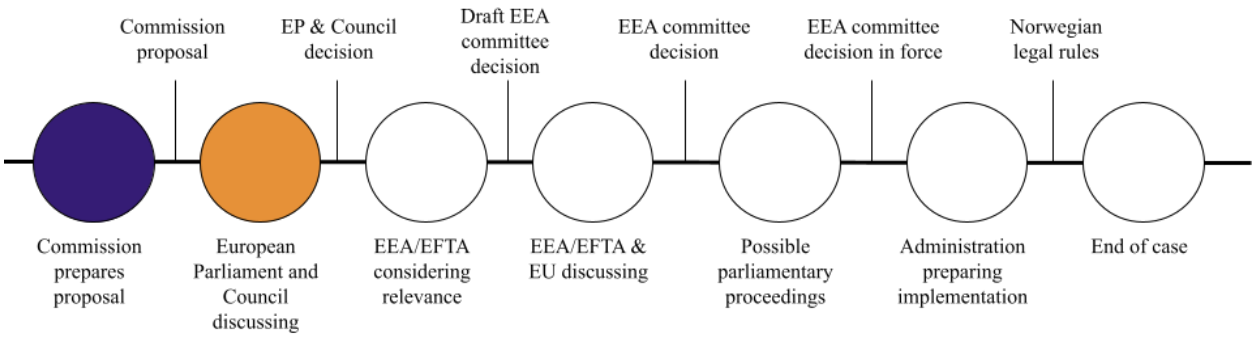

Figure B4, EU & EEA Process for 2021/802 with current status for Norway

In Norway, there are currently 485 office buildings with an EPC rating equal to G.

EPC	A	B	C	D	E	F	G
Percentage	4,47%	11,11%	14,15%	21,57%	19,36%	14,24%	15,10%
Approx. number of buildings	144	357	455	693	622	458	485

Figure B5. Office buildings in Norway, segmented by current EPC rating. Modified from ENOVA(2015).

Green Governmental Funding:

In Norway, Enova SF is owned by the Ministry of Climate and Environment and was established in 2001 to contribute to the restructuring of energy use and energy production, a central instrument in the development of the low-emission society and the energy system of the future. Total grants to for 2022 was 5,7 BNOK (estimated to 1.054,- NOK per capita), where industrial recipients accounted for 1,8 BNOK (Enova, 2022)

In the US, President Joe Biden signed the Inflation Reduction Act on August 16, 2022, marking the most significant action the country has taken on clean energy and climate change, with 370 BUSD. By current exchange rates, this is estimated to be approximately 3.900 BNOK and approx. 1.115,- NOK per capita. These funds are dedicated to driving the global clean energy economy forward. (The White House, 2023)

To achieve the goals set by the European Green Deal, the European Commission has pledged to mobilise at least €1 trillion in sustainable investments over the next decade. Equalling 100 BEUR per year (estimated to 1.152 BNOK and approx.2.577,- NOK per capita), dwarfing both Norwegian and US spending on green initiatives. (EU Commision - Green Deal, 2023)

APPENDIX C - INTERVIEW DATA

Topics (n = no. of interviews discussing the subject)	**Statement**
Current impact of the EU Taxonomy (n = 11)	Increased investor focus, requirement from banks (CB1)
	40-50% CO2 reduction on portfolio by 2030 compared to 2019 (CB2)
	Working on mapping CO2 emissions on portfolio (CB3)
	Started reporting sustainable activities, ripple effects, will eventually affect entire real estate supply chain (CB4)
	Dedicated compliance dept working on taxonomy (IB1)
	Dedicated ESG advisor, analysing cost/benefit EPC (IB2)
	Early phase taxonomy, EU means business (IB3)
	Change of attitude since 2020 from “hassle” to “crucial” (CREI1)
	Little impact to date, more focus on macro trends (CREI2)
	Currently there has been no direct impact outside of reporting.

	Green bond standardisation will add more to the field. (CREBI1)
	GAR-reporting (CREBI2)
Impact newbuild cost with 2030 EU taxonomy vs TEK17 requirements (n = 5)	Minor differences (CB1-3)(IB1-2)
	Minor differences if well planned (CB4)
	Some MNOK more, but still profitable (IB3)
	5-10% increased cost, multiple newbuilds not according to BREEAM due to high certification costs (IB4)
	For CBDs, cost not an issue, long term horizon and will be profitable in the long run in any case (CREI1)
Correlation between real estate value and high environmental rating (n = 10)	Eventually substantial differences. Minor changes in Norway currently, more significant outside Norway. BREEAM equals higher rental and approx.5% higher value (CB1)
	Increased focus down the road, binary system where non compliant buildings (and tenants) will be **pariah** (CB2)
	Mortgage value supersede (green) market value (CB3)
	Safer investment, no concrete percentage (CB4)
	At least 2-3% higher value, int.funds more focused (IB1)
	Only EPC rating (IB2)
	10-15% higher value. Tenants must provide push on landlord to assure change (IB3)
	Yes, easier financing and slightly better interest rates (IB4)
	No, although regarding BREEAM as mandatory. (CREI1)
	It's very important for different actors, internationally more so than domestic. For loans it does not give better terms, but not having a certification on the building might result in **no loan given**. (CREBI2)
Solar Energy strategy (n = 9)	Uncertainty on applicability EU report dated 14.03 (CB1)
	Solar panel leasing option below market interest (CB2)
	Additional OPEX (CB3)

	No guidelines (CB4)
	Recently discussed, solved by third party specialists (IB1)
	Beneficial for tenant, costs for landlord (IB2)
	Self funded by third party, regarded as “greenwashing” (IB3)
	Currently covers 20% of energy needs. Evaluating facade installations for increased area/output (CREI1)
	Ongoing projects, requires economies of scale (CREI2)
Major drivers and valuation methodology (n = 12)	Tenants, ability to service debt, location, residual value risk. DCF large assets, net yield small assets. Tradable (CB1)
	DCF & yield valuation, proprietary RE database (CB2)
	Location, geography, building standard, quality of tenants (forcing the landlord to make improvements). (CB3)
	Location, age, tenant flexibility, standard, quality of tenants. Investor equity. DCF & risk involved, outsourcing valuation to real estate agents. (CB4)
	#1 Good deal! Off market opportunities, project profitability. Today's interest rates, dividends, location, net yield (IB1)
	Price, location, tenants. Value add elements; low rents with short contract duration, and/or expansion of existing buildings. Net yield location based valuation. (IB2)
	Investor dependent, flexible buildings with a good location - low risk with long-term returns. DCF valuation (IB3)
	Location, quality of building, BREEAM/EPC, tenant (government/robust company), short contracts/risky tenants require a higher return. Shorter contracts = easier to get market rent. Net yield valuation, rent/contract structure.(IB4)
	Interest rate (causes reduced asset value). Falling market, few transactions. Valuations lagging approx.6 months after interest has settled. External DCF valuation (CREI1)
	Oil price & electricity price. DCF valuation. (CREI2)
	Valuation of the object, tennant quality, location. Is the project as a whole profitable? Yield limits need to be met. (CREBI1)

	We start by looking at the owners, the solidity of the company and management. Debt servicing capacity, income potential of the prospect and quality of tennant. Cyclic industry is not preferable for us, as yield targets must be met continuously. Valuations appear to be quite unexacting (CREBI2)
LTV (n = 10)	Max 75% (typical 10 years ago) typically now is 50%. (CB1)
	Max 65%, yield increase 1-2% huge impact on value. Lower LTV now, higher equity requirements. (CB2)
	Max 60%, other w/high risk high exposure in market (CB3)
	55-60% now, 2007-2008 80% LTV, 2019 up to 70% at best. 50% then you avoid instalments - 60% you have to pay. Continuous assessments of value. External valuers. New projects are struggling due to high gearing. (IB1)
	As high as possible. Now 60%. Banks are tightening, 50-55% now from 65%. Adjusts value and LTV twice a year. (IB2)
	Experiencing the Nordic market to be most leveraged at 60-65%. Banks' assessments require more collateral. (IB3)
	Up to 60-65% LTV, more restrictive banks. Bond market willing to 65% LTV. Absolute challenge related to LTV. Several cases where the value has decreased considerably with higher interest rates The debt for some buildings is higher than the value, so either have to sell, or inject more equity. (IB4)
	Max LTV on projects. (CREI2)
	Totally 25 BNOK in defaulted debt in 2023 for Norwegian commercial real estate investors, data from internal database. 2 covenant levels on debt; initially 65% and still OK with dividend payouts at LTV > 70%. LTV above 75% equals hard default (breach of loan covenant) and triggers a 20 day deadline to cure the breach. (CREBI1)
	Max LTV 65% (CREBI2)
Access to capital (n = 10)	Some capital difficulties this autumn, less activity due to buyers and sellers both being unsure of values. The capital is there, but the parties are hesitant. Higher interest and taxation (wealth tax), but still an attractive market. (CB1)
	Generally speaking, we do not have any trouble raising

	capital due to our rating. (CB2)
	There has been no change for us when it comes to capital access. The activity in the market has been lower, all parties are sitting back and waiting. (CB3)
	No major issues regarding capital. (CB4)
	Difficult capital market at the moment (IB1)
	Significantly reduced access to capital. Banks make loans more difficult and expensive to obtain. Higher requirements for equity. (IB2)
	Extremely difficult to raise capital. Many are sitting on the fence and waiting for the situation to stabilise. The seller keeps the price high, the buyer expects the price to fall. (IB3)
	Reduced considerably from 2021. Funds and private family offices less interest in property, equals lower return. (IB4)
	Allocation problem, not capital problem. (CREI1)
	It fluctuates, easier funding for CBDs (CREI2)
Green loans (n=10)	Green loans can be used for both rehabilitation and new constructions. As of now, we are unable to provide substantially better terms for green loans compared to ordinary loans, however the certification of the buildings will be worth more than the changes in interest rates. The available margins may increase in the future. (CB1)
	We demand BREEAM very good, or equivalent ratings, to meet green standards for our loans. As long as there's no deductions for green capital, we cannot give significantly better margins on green loans. The green loans follow the asset, and not the client, so as long as the asset meets the requirements any client may get a green loan. (CB2)
	A green loan would be 25 basis points better. (CB3)
	We do not carry green loans as a service at this moment. The margins are just too low for us, but we recommend sustainability to our clients with new construction. (CB4)
	We do not have any green loans. (IB1)
	We currently have no green loans. (IB2)

	No green loans. With the EU taxonomy, brown projects are more likely to get worse terms or **no loans**.(IB3)
	We only utilise green loans for new construction. (IB4)
	As we are self-financed, green loans are not on our radar. (CREI1)
	There's nothing concrete on our end. It [green loans] is beginning to make a presence in construction now, more in the last year. We have gotten signals that green loans will be an option, but as of now we have not taken action to secure them. (CREI2)
Green strategy (n = 10)	Zero emission by 2050, map CO2 in portfolio by 2030, balancing portfolio, 1 P-space per 62.5 employees (CB1)
	Very important, special focus. Training of advisers, sustainability specialists, analysis of buildings etc. Permeates the entire organisation. (CB2)
	Zero emission portfolio ahead of EU. No EPC Fs after 2027. Important in all our meetings. It is important for everyone in society and humanity as a whole. (CB3)
	Specific targets for green buildings and green projects. Discussed on every single loan issued. Important for the bank going forward, also because the public generally thinks this is important. Recommends customers to have a sustainability strategy, provide consultancy for customers. (CB4)
	Our green strategy is to do what the customers want. Irrelevant 3-5 years ago, now high focus (IB1)
	Yes, but it should have been better. Recent deal required separate negotiations with the bank on our green strategy. (IB2)
	Waste segregation and vegetarian meal once a week (IB3)
	Good projects usually have a green profile, and thus nothing to strive for. No longer interested in brown buildings from the 50s. Outward image towards customers (IB4)
	No defined green strategy. Concerned with maintaining the value of buildings,equals updating standard, EPC etc (CREI1)
	No, we have not. Want to have energy-friendly branding, but

	no strategy in place to achieve this. (CREI2)
Personal environmental coherence (n=10)	Public transport to commute, own electric vehicle. (CB1)
	Corporate incentives to use public transport or bikes to commute. But the bank does not interfere with personal choice. (CB2)
	We have a corporate culture focused on biking to work. (CB3)
	The bank has a strategy for sustainability. Employees are recommended to make sustainable choices in everyday life. Drive diesel powered vehicle. (CB4)
	We are recommended by employers to keep active, for instance biking to work. (IB1)
	No. No incentives to adhere to taxonomy in our private lives. (IB2)
	The corporate strategy does most of this on our behalf. (IB3)
	No, it's mostly secondary factors. (IB4)
	No individual rules. (CREI1)
	Few incentives for personal choices. (CREI2)

APPENDIX D - INTERVIEW GUIDE (Norwegian)

Intervjuguide HHUiS eiendomsanalyse

NSD retningslinjer intervjuguide:

Ved intervju og observasjon registreres data kun i form av notater (ikke lydopptak).
Opplysningene må ikke kunne tilbakeføres til enkeltpersoner på noen måte.

Krav til dokumentasjon intervjuobjekt:

- Inndeling i aldersgruppe
    - 20-30 år
    - 31-40 år
    - Over 40 år (dersom flere over 40 år)
- Inndeling i kategori Bank, Obligasjonskjøper, Eiendomseier eller Transaksjonsrådgiver.

- Logg/referat etter intervju skal IKKE inneholde persondata eller tidspunkt for intervju
- Lagres under mappen “Utførte intervju” med filnavn “Intervju X Y” der X representerer kategori og Y nummer i intervjurekkefølge (Sikker lagring av transkripsjon)

Definisjonen av en personopplysning:

Personopplysninger er enhver opplysning som kan knyttes til en person. Eksempler er fødselsnummer, navn eller e-postadresse/IP-adresse. Stemme på lydopptak regnes også som en personopplysning.

Av og til kan en samlet kombinasjon av opplysninger knyttes til en bestemt person. For eksempel om det registreres nøyaktig alder, bosted og studieretning, og det kun er én person på 57 fra Geilo som studerer teatervitenskap.

Om bakgrunnsopplysninger gjør en person identifiserbar avhenger av variablene / de registrerte dataene, men også av kontekst, tema og kriteriene for utvalget.

Merk at dersom det finnes en koblingsnøkkel som kobler opplysningene til ett navn er opplysningene å regne som personopplysninger, selv om forskergruppen ikke har tilgang til denne koblingsnøkkelen.

Prosjektet må meldes hvis du på et tidspunkt sitter på persondata, selv om du skal anonymisere alle personene i publikasjonen eller oppgaven.

Huskeliste under intervjuene:

- Snakk SAKTE
- Noter emosjonell stemning
- Husk taushet underveis, la spørsmålet synke inn og personen få reflektere

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Introduksjonstekst:

Hei XX og takk for sist.

Jeg (XXX) og YY er studenter ved HHUiS der vi er 3 medstudenter som skriver en bacheloroppgave om hvordan taksonomien kan komme til å påvirke eiendomsbransjen for næringsbygg i Norge. Har du 15 minutter ledig nå?

For et forskningsintervju er det strenge retningslinjer fra Norsk senter for forskningsdata for hva vi kan spørre om og hvordan intervjuet gjennomføres.

Intervjuet er 100% anonymt, det gjøres IKKE opptak og alle utsagn vil bli kodet, f.eks. Alder = aldersgruppe. Det vil ikke noteres ned spesifikk alder, vi dropper kjønnsinndeling og vi fjerner alle såkalte "nøkler" som kan brukes for å gjenkjenne en ansatt.

Vi har kun noen få, åpne spørsmål og intervjuet bør ikke ta mer enn 15-20 minutter.

Høres det OK ut?

Forskningsspørsmål:

FS1: Er næringseiendomsaktørene klar over de økonomiske virkningene fra taksonomien?
FS2: I hvilken grad har de forskjellige aktørene forberedt seg på taksonomien?
FS3: Hva er de faktiske utslagene (impact) for næringseiendomsaktørene i prosent?

Intervjuspørsmål til Bank: (låner ut penger, bekymret for LTV, forhandlingsvillige?)

- Hva har EU sin taksonomi å si for dere nå? Om 10 år?
    - Hvilke tiltak?
-
- Hvor stor anslår du at merkostnaden med å bygge et bygg ihht kommende taksonomikrav anno 2030 er sammenlignet med et standard TEK-17 bygg?
    - Hva med oppgradering av eksisterende bygg til EPC E (2030) eller F (2027)?
-
- Er det etter din mening noen sammenheng mellom byggets verdi og BREEAM/EPC/GRESB/Taksonomi-nivå? Hvor mye?
-
- Opplever du at miljøsertifiseringer (BREEAM, EPC, GRESB o.l.) påvirker norske og utenlandske investorer i Norge?
-
- Hva er deres syn på egenprodusert strøm/solceller, evt har dere krav om dette?
    - Egen finansieringsordning for bedrifter, leasing el.l?
    - Har dere kalkulert dette for eksisterende bygg over 250 kvm innen 2027?
-
- Hvilke drivere er størst og viktigst for dere?
    - Hvordan verdsettes et næringsbygg?
    - Hva med LTV og hvor ofte kalibreres LTV?
    - Opplever dere utfordringer knyttet til etterlevelse av ønsket LTV?
    - Hva med rentesats?

    - Hvor ofte kalibreres rentesats? IRR? Kapitaltilgang?
-
- Hva innebærer et grønt lån for dere?
    - Kun renovasjon eller også nybygg og ved eierskifte?
    - Planer om å endre rentesats? Når? Hvor mye?
-
- Har dere en grønn strategi?
    - Hva innebærer denne?
    - Hvor viktig er det at denne etterleves?
-
- Hvordan korrelerer taksonomien med ditt personlige verdisett?
    - Hvordan kommer du deg til/fra jobb? Ferie? Vegetarmåltid?
    - (Fiske etter info knyttet til faktisk bærekraft, ikke være for direkte)

Avslutning/debrief:
- Gjennomgang → oppsummering av intervjuet og det som har blitt sagt. Validering på om det er noe som har blitt feil eller noe de ikke ønsker skal bli tatt med.
- Har du noe å tilføye?
- Hvordan opplevde du intervjuet?
- Ønsker du kopi av sluttrapporten?

Intervjuspørsmål til Transaksjonsrådgiver (lever av prosenter og antall transaksjoner) :
- Hva har EU sin taksonomi å si for dere nå? Om 10 år?
    - Hvilke tiltak?
-
- Hvor stor anslår du at merkostnaden med å bygge et bygg ihht kommende taksonomikrav anno 2030 er sammenlignet med et standard TEK-17 bygg?
    - Hva med oppgradering av eksisterende bygg til EPC E (2030) eller F (2027)?
-
- Er det etter din mening noen sammenheng mellom byggets verdi og BREEAM/EPC/GRESB/Taksonomi-nivå? Hvor mye?
-
- Opplever du at miljøsertifiseringer (BREEAM, EPC, GRESB o.l.) påvirker norske og utenlandske investorer i Norge? Hvordan?
-
- Hva er deres syn på egenprodusert strøm/solceller?
    - Egen finansieringsordning for bedrifter, leasing el.l eller bakes inn i gjeldspakke?
    - Har dere kalkulert dette for eksisterende bygg over 250 kvm innen 2027?
-
- Hvilke faktorer/drivere er størst og viktigst for dere?
    - Hvordan verdsettes et næringsbygg?
    - Hva med LTV og hvor ofte kalibreres LTV?
    - Opplever dere utfordringer knyttet til etterlevelse av ønsket LTV?
    - Hva med rentesats?
    - Hvor ofte kalibreres rentesats? IRR? Kapitaltilgang?

-
- Hva innebærer et grønt lån for dere?
    - Kun renovasjon eller også nybygg og ved eierskifte?
    - Planer om å endre rentesats? Når? Hvor mye?
-
- Har dere en grønn strategi?
    - Hva innebærer denne?
    - Hvor viktig er det at denne etterleves?
-
- Hvordan korrelerer taksonomien med ditt personlige verdisett?
    - Hvordan kommer du deg til/fra jobb? Ferie? Vegetarmåltid?
    - (Fiske etter info knyttet til faktisk bærekraft, ikke være for direkte)

Avslutning/debrief:

- Gjennomgang → oppsummering av intervjuet og det som har blitt sagt. Validering på om det er noe som har blitt feil eller noe de ikke ønsker skal bli tatt med.
- Har du noe å tilføye?
- Hvordan opplevde du intervjuet?
- Ønsker du kopi av sluttrapporten?

Intervjuspørsmål til Obligasjonskjøper (vil ha risikofri investering, soliditet):

- Hva har EU sin taksonomi å si for dere nå? Om 10 år?
    - Hvilke tiltak?
-
- Hvor stor anslår du at merkostnaden med å bygge et bygg ihht kommende taksonomikrav anno 2030 er sammenlignet med et standard TEK-17 bygg?
    - Hva med oppgradering av eksisterende bygg til EPC E (2030) eller F (2027)?
-
- Er det etter din mening noen sammenheng mellom byggets verdi og BREEAM/EPC/GRESB/Taksonomi-nivå? Hvor mye?
-
- Opplever du at miljøsertifiseringer (BREEAM, EPC, GRESB o.l.) påvirker norske og utenlandske medinvestorer i Norge? Hvordan?
-
- Hva er deres syn på egenprodusert strøm/solceller?
    - Egen finansieringsordning for bedrifter, leasing el.l eller bakes inn i gjeldspakke?
    - Har dere kalkulert dette for eksisterende bygg over 250 kvm innen 2027?
-
- Hvilke drivere er størst og viktigst for dere?
    - Hvordan verdsettes et næringsbygg?
    - Hva med LTV og hvor ofte kalibreres LTV?
    - Opplever dere utfordringer knyttet til etterlevelse av ønsket LTV?
    - Hva med rentesats?
    - Hvor ofte kalibreres rentesats? IRR? Kapitaltilgang?

-
- Hva innebærer et grønt obligasjonslån for dere?
    - Kun renovasjon eller også nybygg og ved eierskifte?
    - Forventning om lavere rentesats? Når? Hvor mye?
-
- Har dere en grønn strategi?
    - Hva innebærer denne?
    - Hvor viktig er det at denne etterleves?
-
- Hvordan korrelerer taksonomien med ditt personlige verdisett?
    - Hvordan kommer du deg til/fra jobb? Ferie? Vegetarmåltid?
    - (Fiske etter info knyttet til faktisk bærekraft, ikke være for direkte)

Avslutning/debrief:

- Gjennomgang → oppsummering av intervjuet og det som har blitt sagt. Validering på om det er noe som har blitt feil eller noe de ikke ønsker skal bli tatt med.
- Har du noe å tilføye?
- Hvordan opplevde du intervjuet?
- Ønsker du kopi av sluttrapporten?

Intervjuspørsmål til Eiendomseier (Hvilken risikokategori? Kontantstrøm?):

- Hva har EU sin taksonomi å si for dere nå? Om 10 år?
    - Hvilke tiltak?
-
- Hvor stor anslår du at merkostnaden med å bygge et bygg ihht kommende taksonomikrav anno 2030 er sammenlignet med et standard TEK-17 bygg?
    - Hva med oppgradering av eksisterende bygg til EPC E (2030) eller F (2027)?
-
- Er det etter din mening noen sammenheng mellom byggets verdi og BREEAM/EPC/GRESB/Taksonomi-nivå? Hvor mye?
-
- Opplever du at miljøsertifiseringer (BREEAM, EPC, GRESB o.l.) påvirker norske og utenlandske medinvestorer i Norge? Hvordan?
-
- Hva er deres syn på egenprodusert strøm/solceller?
    - Egen finansieringsordning for bedrifter, leasing el.l eller bakes inn i gjeldspakke?
    - Har dere kalkulert dette for eksisterende bygg over 250 kvm innen 2027?
-
- Hvilke drivere er størst og viktigst for dere?
    - Hvordan verdsettes et næringsbygg?
    - Hva med LTV og hvor ofte kalibreres LTV?
    - Opplever dere utfordringer knyttet til etterlevelse av ønsket LTV?
    - Hva med rentesats?
    - Hvor ofte kalibreres rentesats? IRR? Kapitaltilgang?

-
- Hva innebærer et grønt lån for dere?
    - Kun renovasjon eller også nybygg og ved eierskifte?
    - Planer om å endre rentesats? Når? Hvor mye?
-
- Har dere en grønn strategi?
    - Hva innebærer denne?
    - Hvor viktig er det at denne etterleves?
-
- Hvordan korrelerer taksonomien med ditt personlige verdisett?
    - Hvordan kommer du deg til/fra jobb? Ferie? Vegetarmåltid?
    - (Fiske etter info knyttet til faktisk bærekraft, ikke være for direkte)

Avslutning/debrief:

- Gjennomgang → oppsummering av intervjuet og det som har blitt sagt. Validering på om det er noe som har blitt feil eller noe de ikke ønsker skal bli tatt med.
- Har du noe å tilføye?
- Hvordan opplevde du intervjuet?
- Ønsker du kopi av sluttrapporten?

Intervjuspørsmål til Eiendomseier (Hvilken risikokategori? Kontantstrøm?):

- Hva har EU sin taksonomi å si for dere nå? Om 10 år?
    - Hvilke tiltak?
-
- Hvor stor anslår du at merkostnaden med å bygge et bygg ihht kommende taksonomikrav anno 2030 er sammenlignet med et standard TEK-17 bygg?
    - Hva med oppgradering av eksisterende bygg til EPC E (2030) eller F (2027)?
-
- Er det etter din mening noen sammenheng mellom byggets verdi og BREEAM/GRESB/Taksonomi-nivå? Hvor mye?
-
- Opplever du at miljøsertifiseringer (BREEAM, EPC, GRESB o.l.) påvirker norske og utenlandske medinvestorer i Norge? Hvordan?
-
- Hva er deres syn på egenprodusert strøm/solceller?
    - Egen finansieringsordning for bedrifter, leasing el.l eller bakes inn i gjeldspakke?
    - Har dere kalkulert dette for eksisterende bygg over 250 kvm innen 2027?
-
- Hvilke drivere er størst og viktigst for dere?
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    - Hva med LTV og hvor ofte kalibreres LTV?
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- Hvordan korrelerer taksonomien med ditt personlige verdisett?
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APPENDIX E - VALUATION METHODS

Discounted Cash Flow Analysis (DCF)

In a report from 2010, the Financial Supervisory Authority concluded that in Norway, discounted cash flows supported by market information are the preferred method used to value real estate. (Financial Supervisory Authority, 2010)

Cash flows normally take into account contracted rental income, future assessed market rent, current and expected vacancy, ownership costs, and tenant adaptation costs. There are different

practices regarding forecast period, valuation of residual value, and accuracy in payment timing and calculation of actual rental income.

The discount rate used varies in size, but it typically consists of a risk-free rate that includes a real interest rate plus expected inflation. The risk premium varies depending on how each company makes its assessments.

The value of future cash flows can be calculated using the expression:

$$PV = \frac{C_1}{(1+r)^1} + \frac{C_2}{(1+r)^2} + \ldots\ldots = \sum_{n=0}^{N} \frac{C_n}{(1+r)^n}$$

Where PV is the present value of future cash flows C at a discount rate of r and a calculation period of n. The discount rate consists of a risk-free rate plus a risk premium. To calculate the value more specifically, the present value of future income and residual value is used, minus initial and future investments:

NPV = Sum of cash flows + residuals

If NPV is greater than zero, the investment achieves the desired return and it makes sense to invest.

$$NPV = \sum_{n=0}^{N} \frac{C_n}{(1+r)^n} + SV \cdot \frac{1}{(1+r)^n}$$

SV is the residual value at the end of the calculation period. The residual value SV is based on future rental income and is given by the formula:

$$SV = \frac{NOI_{n+1}}{r - g}$$

Where r is the discount rate and g is the expected growth in future rental income. This can normally be set equal to inflation. NOI is net rental income, i.e., rental income minus operating expenses and vacancy.

Net Yield

In the real estate industry, the term is used as a designation for the relationship between net rental income and property value (net rental income divided by property value). This is a rule of thumb that provides a snapshot of the direct return of a property in a simple way.

Net Yield is simply explained as a snapshot of the yield from rental income on a property. The most used yield term within the property industry is net yield, which is an expression of the direct return from net rental income, i.e. rental income minus ownership costs.

To calculate the net yield, you take the property's rental income, subtract annual ownership costs and divide by the property's value. In other words, the yield shows how large a percentage of the property investment you "get back" in the form of net rental income annually.

$$\text{Net Yield} = \frac{Rental\ income - Property\ costs}{Property\ Value}$$

Converting to property value, the equation equals:

$$\text{Property Value} = \frac{Rental\ income - Property\ costs}{Net\ Yield}$$

The term yield is often used as an expression of the pricing of a property (net rental income divided by yield = price), and must be seen in the context of the risk one considers that the investment entails. The term yield makes it easy to compare the price of a property with other properties in the same risk group.

Annual Rental Income = 5 MNOK
Annual Ownership Costs = 1 MNOK
Real Estate Value = 100 MNOK
$5\ MNOK - 1\ MNOK = 4$ MNOK

$$\frac{4\ MNOK}{100\ MNOK} = Net\ Yield = 4\%$$

Figure D1. example net yield.

The net yield in figure D1 is 4.00%, which means that the property generates an annual direct return to the owners of 4.00%. As the example shows, the yield calculation is simple and effective, and it is a useful figure that can be used to compare different property investments. However, it is important to note that the key figure shows a simplified reality, and if investors are going to make a property investment, they must look in more detail at the expected income and costs of the property.

Simplifying assumptions when calculating yield:

- Tax is not taken into account.
- The earnings (rental income) are permanent and do not change.
- The risk basis for the property is static.
- The caveat is that the property is acquired without a loan, i.e. bought with equity only.

It is also worth mentioning the discussion around operating costs (ownership costs), and what these include. Normally only looking at operating costs that do not include the investor's management costs, as these may vary from landlord to landlord. Costs for investments and upgrades, i.e. extraordinary costs, are also excluded from the calculation. (Malling, 2022)

Location-based pricing method

This method is based on gathering market data from the relevant area. The advantage is that it is based on direct market information and should therefore be fairly accurate. The disadvantage is that it requires good data. (Lind, H., Mandell, S. & Brunes, F., 2014)

Challenges with this method may include defining an area, not all sales are recorded, not all prices are representative, sales prices for property companies are not recorded, sales can occur as portfolio sales, there may be too little data or too little accuracy in the data.

To make properties comparable, a physical factor that expresses a value is often used. This can be area, number of rooms, or volume. There are several different methods:

Method	Factor	Value-creating factor	Market value
Area	Area(m²)	Observed price pr. m²	MV=Area*price per m²
Gross capitalization	Gross rent	Gross cap. factor	MV= Gross rent * Gross cap. factor
Net Capitalization	NOI	Net capitalization factor	MV= NOI/Net capitalization factor

The Production Cost Method

This method is rarely used but can be used where there is poor or no data or information on return. The method is considered difficult and is associated with uncertainty. (Lind et al., 2014)

The method is divided into steps:

- First, one starts with an assessment of the value of the land based on evaluations of "highest or best use," site-pricing methods, or income methods.
- Next, one evaluates the construction costs of a new building.
- The construction cost of a hypothetical new building is reduced by an ageing factor to compare it with existing buildings. Ageing factors can be physical, functional, or changes in external conditions.
- Finally, one can calculate the market value:

Lot value + Construction costs - Depreciation due to ageing = Market value.