SustainaWeekly

Does knowledge of foundation problems impact house prices?

- **Economist: Climate change can increase the risk of foundation problems. Most house sale advertisements in the Netherlands do not mention the condition of the foundation, even though it has a big effect on the house price. We estimate that the mentioning of a repaired foundation leads the house price to increase by two per cent. Meanwhile, listing a poor foundation in the house advertisement, reduces the sale value by 12 per cent. We suspect that foundation risks are not fully priced into the housing market.**

- **Strategist: Carbon credit markets have been experiencing rapid growth driven by corporate net zero targets. However, recent studies suggest that carbon reduction from Verra rainforest credits is being overstated. Verra strongly disputed these claims, with the modelling of the counterfactual being the heart of the discussion.**

- **Sector: Thanks to the net-metering scheme, small-scale solar energy generation has increased significantly in the Netherlands, accounting for about 40% of all energy generated by solar panels. Yet the government wants to scale down the scheme. The change should be accompanied by incentives for home batteries, allowing the growth of the sector to continue.**

- **ESG in figures: In a regular section of our weekly, we present a chart book on some of the key indicators for ESG financing and the energy transition.**

In this edition of the SustainaWeekly, we first present a study the extent to which reported foundation damage is factored into the sale price of homes in the Netherlands. Climate change can increase the risk of foundation problems and is a key physical risk for housing markets. We go on to take a closer look at carbon offset markets and recent reports suggesting that carbon reduction in the underlying projects is being overstated. Furthermore we look into the consequences of the government scaling down the net-metering scheme, which has provided such a boost to small-scale solar energy generation.

Enjoy the read and, as always, let us know if you have any feedback!

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Reported foundation damage results in significant lower sales price

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- **Climate change can increase the risk of foundation problems**
- **Most house sale advertisements do not mention the condition of the foundation, even though it has a big effect on the house price**
- **When mentioning a repaired foundation, the house price increases by two per cent**
- **Listing a poor foundation in the house advertisement, reduces the sale value by 12 per cent**

Foundations of properties do not last forever, and if they have to be replaced, it leads to substantial repair costs of 50k to 100k euros or more per property. According to FunderMaps - KCAF's (knowledge centre for foundation problems) database for analysis into foundation risk areas - it is estimated that around one million homes in the Netherlands face or may face foundation problems. That is one in four homes built before 1970. The KCAF estimates that the total amount of damage could reach EUR 60 billion by 2050.

Climate change can increase the risk of foundation problems. For instance, prolonged drought can cause soil subsidence, groundwater level decline and groundwater level fluctuation, with an increased risk of rotting and foundation subsidence. As in 2018, the past dry summer is likely to lead to a large increase in complaints about cracks and subsidence in houses.

However, of many homes, the quality of the foundation is unknown at the time of purchase. To actively check the status of the foundation, buyers should be aware that the foundation, although not visible, is an important part of a property. Buyers themselves can also hardly estimate the quality of their property's foundation, let alone the chances of future foundation problems. In this article, we examine the extent to which reported foundation damage is factored into the sale price of homes.

Mapping foundation problems

Currently, foundation data are known for only 1 in 40 properties with a pre-1970 construction year. Foundation problems mostly occur in historical cities, such as Amsterdam, Rotterdam, Gouda, Delft, Leiden, Haarlem and Zaandam. Properties that do not have wooden piles, but have shallow foundations on clay or peat, are obviously not susceptible to pile rot - but they are susceptible to damage from subsidence. These properties are also included in the analysis.

Method and data

To understand the price effects of reported foundation quality, we use Brainbay's automated valuation model. This model uses machine learning techniques, and is applied on the NVM database that contains a very rich set of available house characteristics. The quality of a house foundation is unknown to the valuation model - and we take advantage of this. In this analysis we compare the value the model provides for a property with the actual realised transaction price.

For data on the condition of the foundation, we use mentions of foundation quality in listing texts. All house listing texts from January 2019 to June 2022 were examined for mention of foundation quality using 'text mining'. Mention of foundation quality in sales texts is relatively rare. In only 2.2 per cent of the screened offer texts of houses built before 1975, something is written about the foundation. About half of these (in the other half, the quality is not clear from the text) can then be classified into one of three classes: repaired foundation, poor foundation or foundation clause. We observe a total of 208 offer texts that mention poor foundation, 2,656 with a mention of repaired foundation, and 293 with a foundation clause.

Results: price difference corresponds to repair costs

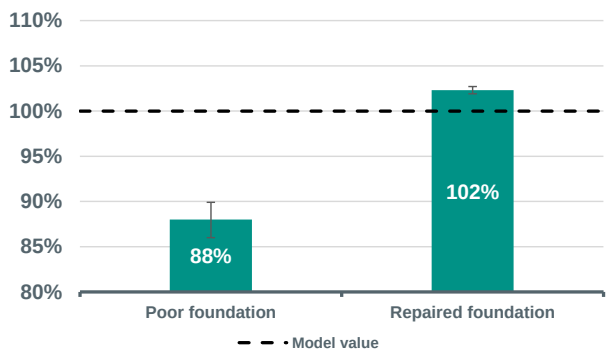
The price effect of a reported poor foundation relative to a reported repaired foundation is significant. On average, the sales value of the houses with a poor foundation is 12 per cent lower than the estimated value the model made without knowledge of the condition of the foundation – a difference of 47k euros. This difference is statistically significant.

On the contrary, for a listed repaired foundation, we observe a significantly higher sales price than the model valuation. On average, a house with a listed repaired foundation has a two per cent higher sales value than the model estimated without knowledge about the condition of the foundation - this corresponds to a difference of 13,500 euros.

To calculate the price difference between a property with a listed poor foundation and a comparable property with repaired foundation, both the poor and repaired properties should first be compared with the model value. Then the deviations of properties with repaired and poor foundations from the model value can be compared among themselves. This brings the difference between poor and repaired properties to over EUR 60k. Since other features such as house quality are already included in the model, this difference is attributable to the difference in foundations. The cost of foundation renovation thus seems to be reflected, at least to a large extent, in transaction prices.

Realised sales price by reported foundation quality

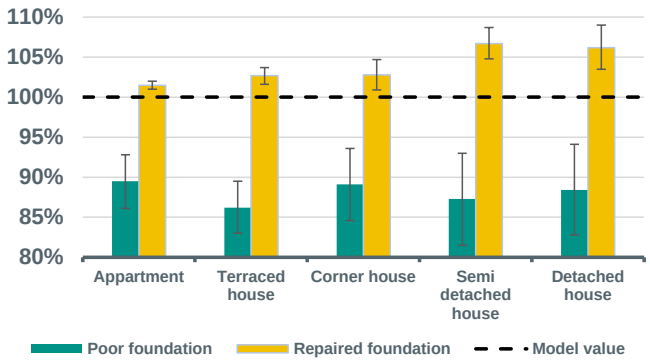
As percentage of model valuation



Source: Brainbay, ABN AMRO

Realised sales price by reported foundation quality

As percentage of model valuation



Source: Brainbay, ABN AMRO

As the house type has a significant impact on house value, we have reported the price effects of foundation quality by house type separately. For all house types, we see a significant negative price difference between the transaction price of houses with a reported poor foundation compared to the estimated value made by the model without knowledge about the condition of the foundation. This price difference is smallest for flats, here it is a ten per cent lower transaction price. For the other housing types, although the deviation in the transaction price from the model valuation is larger, it does not deviate significantly from the ten per cent for flats. Since the average house value of detached houses is higher than flats, an equal percentage decrease does mean that the amount in euros is larger for detached houses. This makes sense because repair costs are also higher for a detached house compared to a flat.

The price difference between a listed repaired foundation and a listed poor foundation is smallest for flats, and largest for detached houses. For flats, we see a price difference of around 50,000 euros, while the price difference for detached houses is over 80,000 euros. This can be explained by the fact that for a house, the repair costs are related to the number of square metres of ground floor. In an apartment building, on the other hand, the cost can be shared by all the flats.

Discussion and policy recommendation

Our results show that foundation problems are roughly priced in when the condition of the foundation is known. This is good news for buyers buying a property where the quality of the foundation is made explicit in the offer text. However, buyers do not appear able, in the tight market situation during the study period, to negotiate an even lower price on top of the repair costs as compensation for the time and effort it will cost them to have the foundation repaired. Perhaps this will play out differently in a weaker housing market where buyers have a better bargaining position.

In the vast majority of listing texts, there is no explicit mention of the condition of the home's foundation. This while some million pre-1975 properties are expected to face foundation damage. So buyers usually have to actively seek information themselves.

To what extent the foundation risk of houses without reporting foundation quality is priced in, we have not been able to investigate. However, we suspect that the high cost of examining the foundation and the large number of competing bidders in the housing market means that the risks are not fully priced in. This would mean that large groups of buyers would face the additional cost of foundation repair as soon as the damage becomes visible.

Transparency about the quality of foundations is vital to ensure that the cost of repair does not fall unilaterally on new buyers in a tight housing market. Our research shows that when foundation quality is mentioned, it plays a significant role in home value.

The municipality of Zaanstad can be an example for other municipalities in terms of transparency about foundation quality. Municipality policy explicitly aims to inform residents, sellers and buyers about the quality and options for repair. For example, the municipality monitors foundations in areas with older homes through a growing network of measuring bolts. Homeowners can view measurement data online. If a property is monitored by Zaanstad municipality it is also listed on the website funderingen.zaanstad.nl/fundingen/fundingsmap. This also allows any interested home buyers to know whether information on the status of the foundation is known to the seller. As a result, damage that builds up slowly gradually translates into the selling price, so buyers and sellers will share the costs.

When more municipalities adopt such policies, the risk of buyers unilaterally bearing the costs and risks of foundation problems decreases.

The original article in Dutch is published in **ESB**.

The counterfactual problem for carbon offsets

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- **Carbon credit markets have been experiencing rapid growth driven by corporate net zero targets**
- **However, recent studies raise questions about whether credits represent real carbon reduction**
- **Two studies suggest that carbon reduction from Verra rainforest credits is being overstated**
- **Verra strongly disputed these claims, with the modelling of the counterfactual being the heart of the discussion**
- **There are initiatives in place to help strengthen credibility and growth of carbon credit markets**

Companies with voluntary carbon targets use the carbon credit markets to offset emissions they cannot eliminate, or at least not as quickly as necessary. The purchase of these certificates should complement the commitment to an ambitious internal decarbonization strategy, rather than being a substitute to one. The supply of credits mainly comes from various crediting mechanisms, with independent crediting mechanisms being the largest in size. Carbon credits represent quantities of greenhouse gases that have been kept out of the air or removed from it and include avoided deforestation, reforestation, avoidance or reduction of emissions and technology-based removal of carbon dioxide from the atmosphere. Voluntary carbon credits can also direct private financing to projects that reduce emissions that may not have happened otherwise.

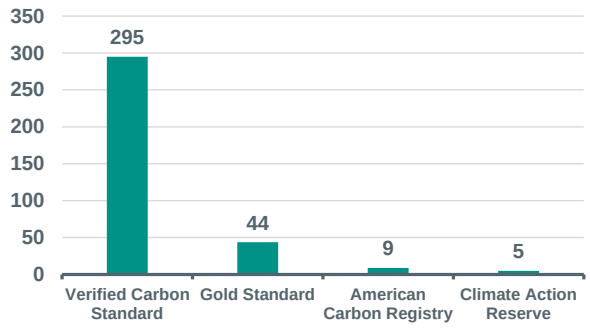
Small but rapidly growing market

The market is still small but is growing rapidly, reflecting both rising prices and rising demand from corporate buyers, on the back of growing net zero commitments, leading to higher volumes. According to the World Bank, the total value of the voluntary carbon market exceeded USD 1 bn by the end of 2021 and had already reached USD 1.4 bn by the middle of last year (see here). The Taskforce on Scaling Voluntary Carbon Markets (TSVCM) estimated that the market for carbon credits could be worth as much as USD 50 billion in 2030. The World Bank estimates that global average carbon credit prices moved from USD 2.49/tCO2e in 2020 to USD 3.82/tCO2e in 2021. Still, this is significantly below what for example the levels determined under the EU's Emissions Trading System (ETS).

Growth in the carbon credit market is expected to be driven by accelerating demand due to rising net zero commitments by companies and increased supply of nature-based solutions and new technologies. Though a McKinsey report (see here) notes that the development of projects would have to ramp up at an unprecedented rate and the challenges in realising this could slow the growth in the voluntary carbon market.

Independent credit mechanisms - issuance

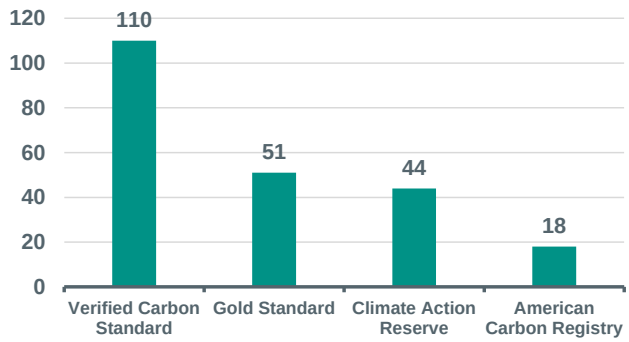
Credit issuance in 2021, MtCO2eq



Source: World Bank State and Trends of Carbon Pricing 2022

Independent credit mechanisms – projects

Number of projects in 2021



Source: World Bank State and Trends of Carbon Pricing 2022

The carbon credit market is dominated by a small number of independent nongovernmental entities, which provide standards and crediting mechanisms (see charts above). Independent credit mechanisms account for three-quarters of issuers. Within this, the Verified Carbon Standard (Verra) is by far the largest in terms of credit issuance and the number of

projects. However, as mentioned above, the size of this market is much smaller than compliance markets, such as emissions trading schemes (ETS). For instance, such schemes generated USD 56bn in revenue in 2021, dwarfing the numbers discussed above for carbon credit markets.

New research questions carbon offsets

As the World Bank notes, there remain significant debates about how to ensure the quality and integrity of carbon credits. The fundamental challenge is that the climate benefits from carbon credits can only be estimated against a counterfactual or reference scenario, which can obviously never be actually observed. Indeed, two recent studies have questioned the real carbon reduction in the projections that underpin some carbon credits. An investigation by the Guardian, Die Zeit and SourceMaterial (see **here**) claims that a significant percentage of Verra's rainforest credits are 'phantom credits that do not represent genuine carbon reductions'. This is strongly denied by Verra, which prides itself on 'scientific rigor and transparency', which has a process based on standard rules and requirements for each project, peer-reviewed accounting methodologies and with projects subject to independent auditing.

At the heart of the debate is the counterfactual. The investigation claims based on two studies from an international group of researchers that just eight of twenty-nice projects analysed showed 'evidence of meaningful deforestation reductions'. Separately an analysis of 32 projects found that 'baseline scenarios of forest loss appeared to be overstated by about 400%'. Verra has criticised the studies for using a 'standardised approach', which cannot measure the 'unique local threats' faced. In addition, it argues that 'synthetic controls' were employed, with the comparable areas used as a basis for deforestation measurement not reflecting pre-project conditions, but rather a hypothetical scenario rather than a real area (which is counter-denied by the researchers).

Furthermore, another important issue with carbon credits is that those are finite. There is only a certain amount that can be done to offset emissions, particularly when using natural removal techniques. This means that once deforestation measures have exhausted, or renewable energy capacity has increased, for example, companies are still left with emitting the same as they did before. This would not be a problem under a carbon offsetting mechanism using carbon removal and storage techniques. However, besides the fact that such technology is still in infant stages, such certificates would certainly not cost anything near the mere average of USD 3/ton.

Initiatives underway to help strengthen credibility of carbon offsets

The Integrity Council for the Voluntary Carbon Market - an independent governance body for the voluntary carbon market – is working on scaling up the transactions for voluntary commitments by promoting high-quality credits and standardization of contracts to improve liquidity. It plans to set out this quarter its Core Carbon Principles (CCPs) and Assessment Framework (AF), which will set new threshold standards for high-quality carbon credits, provide guidance on how to apply the CCPs, and define which carbon-crediting programs and methodology types are CCP-eligible. This follows a public consultation that was launched in July of last year. Meanwhile, the World Wildlife Fund, the Öko-Institut, and the Environmental Defense Fund have launched the Carbon Credit Quality Initiative, which aims to deliver an interactive web application for scoring carbon credit quality.

Meanwhile, there are numerous other initiatives that set out specific rules on how carbon credits can be used for compliance by companies within a credible climate target framework. For instance, the Science-Based Targets Initiative (SBTi), has set out the Corporate Net Zero Standard, which specifies restricted scenarios in which the use of carbon credits will be accepted for meeting net zero targets. The targets require 'long-term deep decarbonization targets of 90-95% across all scopes before 2050. When a company reaches its net-zero target, only a very limited amount of residual emissions can be neutralised with high quality carbon removals, this will be no more than 5-10%'.

Less room for offsetting for small-scale solar generation

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- **The Netherlands has ambitious targets for reducing CO2 emissions**
- **The build-up of solar energy capacity plays an important role in this**
- **Solar panels on homes generate 40% of solar energy**
- **The net-metering scheme has stimulated small-scale solar energy generation**
- **The government wants to phase out the net-metering scheme over the next few years**
- **This may affect small-scale solar power generation**
- **Home batteries and the deployment of electric cars could provide a solution**

Introduction

The Netherlands aims to reduce CO2 emissions by at least 55% from 1990 levels by 2030 and to cut them completely by 2050. This requires that the share of renewable energy increases dramatically. Besides onshore wind, offshore wind and biomass, solar energy is an important source of renewable energy. Solar energy requires solar panels and an inverter. An inverter converts the direct current generated via solar panels into usable alternating current for the households. The energy flows into the home's electricity grid via this route. Solar power generation is also known as solar PV.

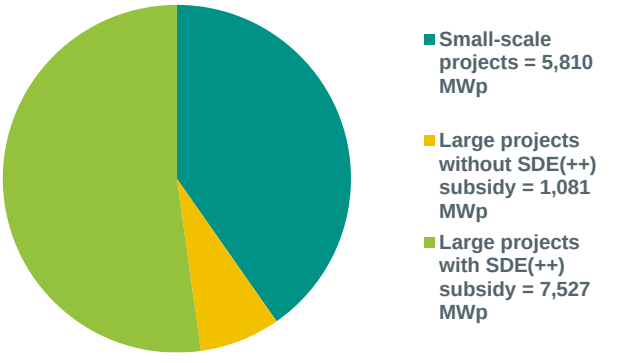
Solar PV target

The target for renewable energy (offshore and onshore) for 2030 was 84 Terawatt Hour (TWh) in the 2019 climate agreement signed by companies and the government. The target for wind on sea was 49 TWh and for solar and wind on land 35 TWh. This target was revised upwards to 120 TWh in the 2021 coalition agreement. In 2021, the share of renewable electricity in total electricity consumption was 33.8% of the 121,8 TWh or 41,2 TWh. Currently the share of solar PV is 9.3% of the total is around 11,3 TWh.

The Climate Accord agreed that efforts by decentralised authorities leading to more than the estimated 7 TWh of small-scale solar generation (such as local incentive schemes) count towards the task of achieving 55% reduction. In a letter to the House of Representatives, the Minister for Climate and Energy indicated that due to the tightened CO2 reduction target of 55%, he would recalibrate the target of 35 TWh of renewable electricity production on land (solar and wind).

Installed solar PV capacity at the end of 2021

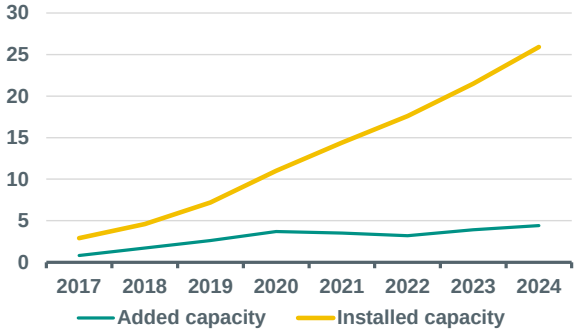
Total 14,418 MWp



Source: RVO, ABN AMRO Group Economics, MWp = 1,000,000 Watt peak

Installed and added capacity

In MWp x1000, 2022-2024 expected capacity



Source: RVO, Monitor Solar-PV 2022 in the Netherlands, ABN AMRO Group Economics, MWp = 1,000,000 Watt peak

Small-scale generation of solar energy

Solar energy can be generated in small-scale projects with a net-metering scheme, large projects that do not receive subsidies from the sustainable energy production incentive scheme (SDE(++)), and large projects that do receive subsidies from the SDE(++) scheme. The net-metering scheme was established in 2004 to encourage investment in solar panels by homeowners. The electricity that solar panel owners do not directly use themselves, they feed back to their supplier. They can offset this electricity - measured over a calendar year - against the electricity they buy. As a result of the net-metering

scheme, the price sold the electricity delivered back to the supplier is as high as the price the small-scale consumer pays for the electricity he buys from the supplier. In addition, taxes and costs for supply and storage of renewable energy do not need to be paid on the electricity supplied back to the supplier.

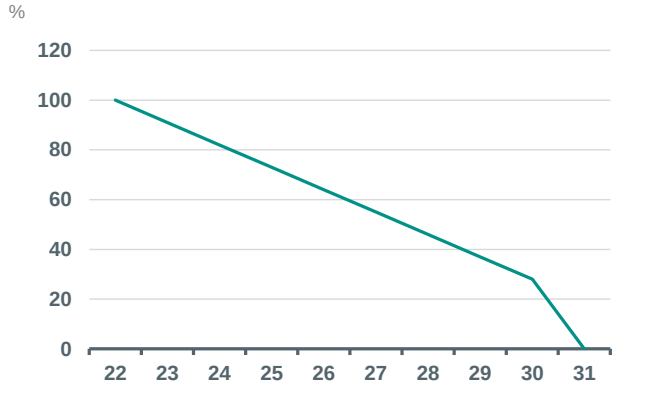
In 2021, solar power's share of total electricity consumption was 9.3%. A total of 14,418 MegaWatt peak (MWp) of solar PV capacity was generated. Of this, 5,810 MWp was from small-scale projects (smaller than 15 KWp) with net-metering and other schemes. This is equivalent to about 4.7 TWh in 2030 .The climate agreement assumes that small-scale solar PV generation will grow to 7 TWh in 2030. Over the past two years, this increased by about 1,100 to 1,200 MWp per year (around 1 TWh). This has yet to be recalibrated to the 2021 coalition agreement where the CO2 reduction target has been raised from 49% to at least 55%.

The majority of solar energy generated via small-scale projects comes from solar panels on homes (96%). The number of homes with solar panels is growing rapidly. By the end of 2022, 2 million homes had solar panels compared to 1.5 million in 2021. In 2021, 35% of owner-occupied houses and 16% of social housing properties had solar panels. The average maximum power per solar panel is currently 400 Wp. However, there are also solar panels of 500 Wp, although these tend to be more expensive and larger, which means fewer can be installed on a roof. A 400 Wp solar panel produces about 340 kWh per year. The conversion factor of 0.85 is based on the number of sunlight hours and light intensity.

Phasing out of the net-metering scheme

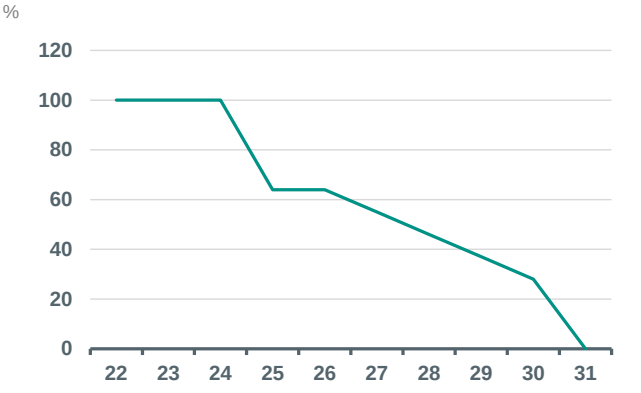
On 17 January, the House of Representatives had a plenary session on Minister Jetten's proposal to phase out the net-metering scheme from 2025. Earlier, the idea was to reduce the net-metering from 2023. This is now likely to become 2025. From then on, only 64% of the electricity supplied back may be netted (see chart below). Energy tax and supply costs will have to be paid on the part that is not netted. After 2025, the scope for balancing will be further reduced to ultimately zero in 2031. The reduction of the balancing percentage to 64% in 2025 means that a household supplying 2,000 kWh back to the grid will only be allowed to balance 1,280 kWh (while currently the 2,000 kWh is allowed to be balanced) . On the remainder of the 720 kWh feed-in it will receive a fee from the supplier on which energy tax must be paid.

Previously proposed phase-out rate



Source: Rijksoverheid, ABN AMRO Group Economics

Proposed phase-out rate



Source: Rijksoverheid, ABN AMRO Group Economics

What are the reasons for phasing out netting?

The net-metering scheme has caused solar panels on homes and small-scale solar energy production to increase significantly. Nevertheless, the minister wants to phase out the net-metering scheme. To this end, he cites the following reasons. First, the sharp decrease in payback time. A TNO analysis shows that the payback time of 10 solar panels purchased in 2022 is 5 years. Should netting be phased out as per the proposal, the payback period will increase to around 7 years. This assumes an average investment cost of EUR 1.20 per Wp. This Wp price is currently EUR 1.85, a considerable increase. This probably already ensures a longer payback period. But the current high energy prices make solar panels attractive again.

Secondly, the net-metering scheme does not encourage small consumers to use their own generated solar energy, or to store it. With the growth of renewably generated power, the supply of power fluctuates widely during the day, peaking during early afternoon. Due to the extensive supply, the spot price of energy is then at a low level. The current net-metering scheme removes the incentive to use appliances in the home at that time, or to store currently generated energy in a battery for use at a later time. Instead, power is fed back, which can overload the grid. Expanding the grid to prevent overloading requires substantial investment.

Should net-metering be phased out, this is likely to weigh on the demand for solar panels. In recent years, added capacity increased by 1,100 to 1,200 MWp. The energy crisis and higher energy costs have further increased the demand for solar panels. Due to the lack of qualified personnel, the demanded capacity has not yet been fully added. This will probably still happen in the first half of 2023, so that the added capacity will continue to increase significantly. However, once the decision to reduce the scope for offsetting becomes a reality, fewer households are likely to have solar panels installed.

Still, there are bright spots. The government could encourage the purchase of home batteries. These are currently expensive to buy, but can help prevent peak loads on the grid. What does a home battery do? Part of the energy generated by solar panels is consumed. The part that is not consumed is stored in the home battery. Only when the battery is full, power is fed back into the grid. The energy stored in the home battery can be used when it is dark, or on days when less energy can be generated. Depending on the storage capacity, a home battery can bridge one or several days. Unfortunately, home batteries are pricey to buy for the time being. A possible alternative is to use the electric car as temporary storage. Currently, it is not yet possible to use the energy charged in an electric car battery back in homes. But developments are currently going very fast, so such a trajectory is in sight.

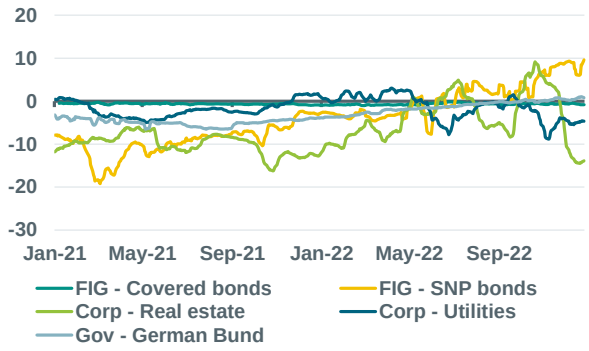
Conclusion

In the coalition agreement, the Netherlands has revised upwards its targets for CO2 reduction and the share of renewable energy in the energy mix. Solar panels are an important way to generate energy. Thanks to the net-metering scheme, small-scale solar energy generation has increased significantly. Small-scale solar energy generation accounted for about 40 per cent of all energy generated by solar panels in 2021. Scaling down the energy-saving scheme, which is what the government now wants, could put a brake on the expansion of small-scale solar power generation. This could make it harder to meet climate targets. Alternatively, the change could be accompanied by incentives for home batteries and the use of electric cars as home batteries, allowing the growth of solar power generation from small-scale projects to continue.

ESG in figures

ABN AMRO Secondary Greenium Indicator

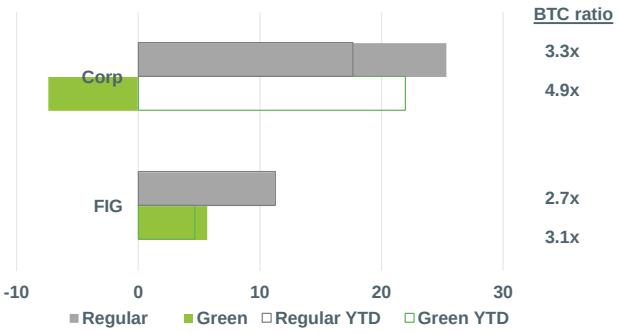
Delta (green I-spread – regular I-spread)



Note: Secondary Greenium indicator for Corp and FIG considers at least five pairs of bonds from the same issuer and same maturity year (except for Corp real estate, where only 3 pairs were identified). German Bund takes into account the 2030s and 2031s green and regular bonds. Delta refers to the 5-day moving average between green and regular I-spread. Source: Bloomberg, ABN AMRO Group Economics

ABN AMRO Weekly Primary Greenium Indicator

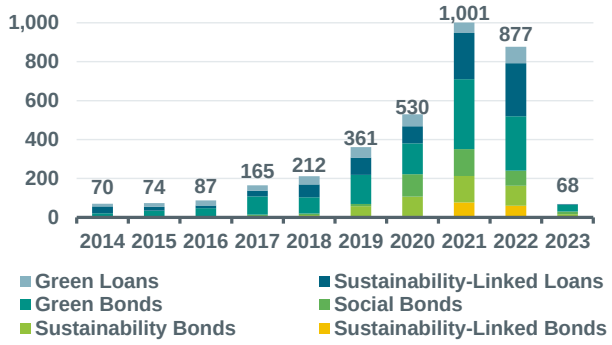
NIP in bps



Note: Data until 19-1-23. BTC = Bid-to-cover orderbook ratio. Source: Bloomberg, ABN AMRO Group Economics

Sustainable debt market overview

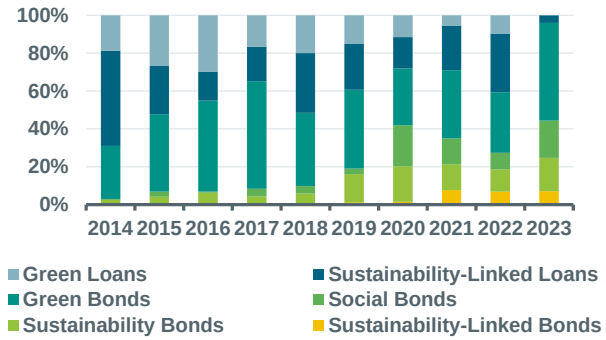
EUR bn



Source: Bloomberg, ABN AMRO Group Economics

Breakdown of sustainable debt by type

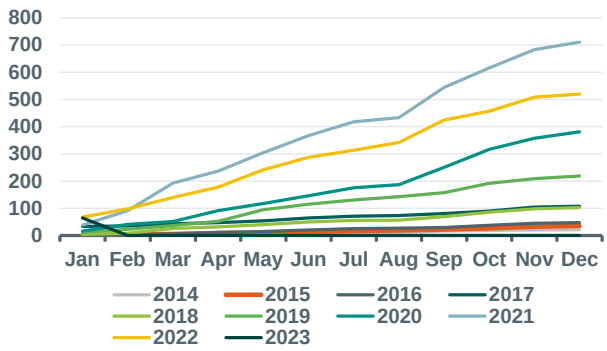
% of total



Source: Bloomberg, ABN AMRO Group Economics

YTD ESG bond issuance

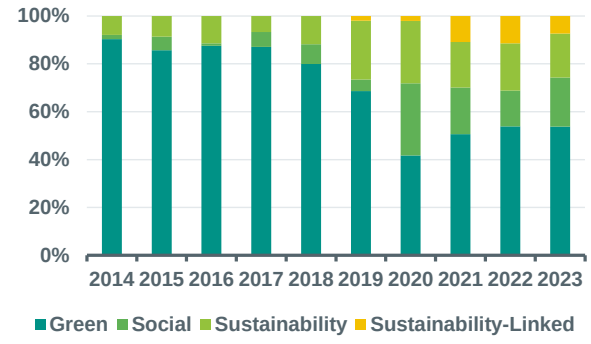
EUR bn (cumulative)



Source: Bloomberg, ABN AMRO Group Economics

Breakdown of ESG bond issuance by type

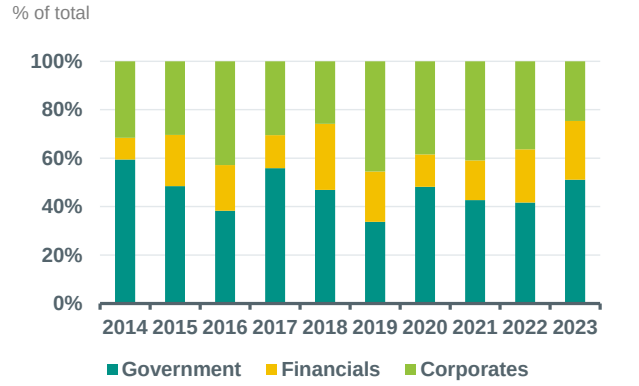
% of total



Source: Bloomberg, ABN AMRO Group Economics

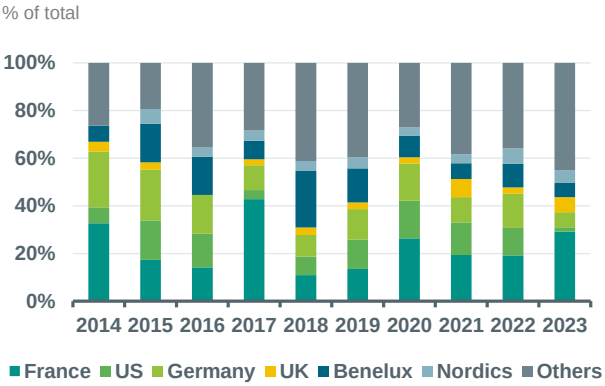
Figures hereby presented take into account only issuances larger than EUR 250m and in the following currencies: EUR, USD and GBP.

Breakdown of ESG bond issuance by sector



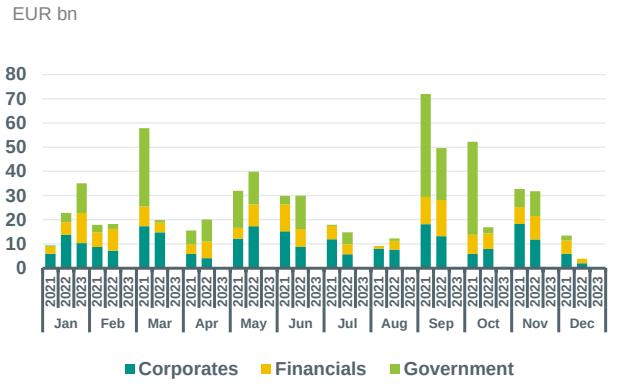
Source: Bloomberg, ABN AMRO Group Economics

Breakdown of ESG bond issuance by country



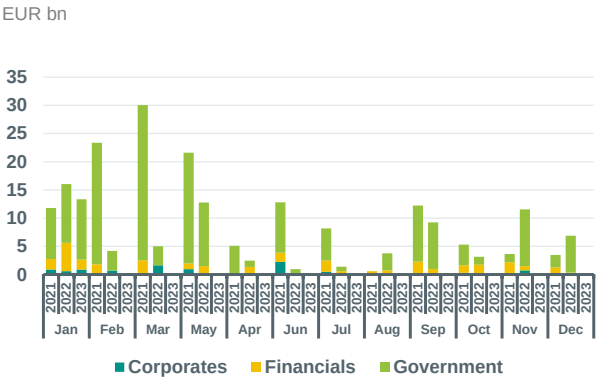
Source: Bloomberg, ABN AMRO Group Economics

Monthly Green Bonds issuance by sector



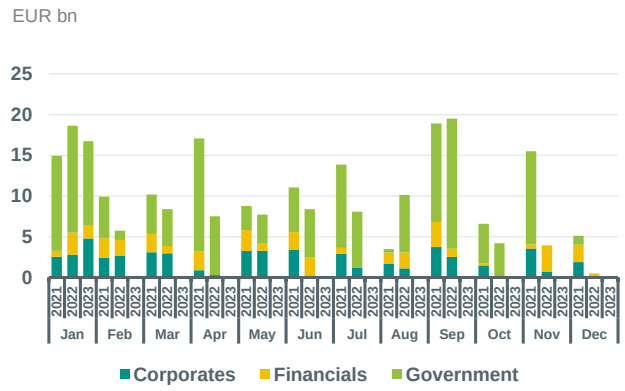
Source: Bloomberg, ABN AMRO Group Economics

Monthly Social Bonds issuance by sector



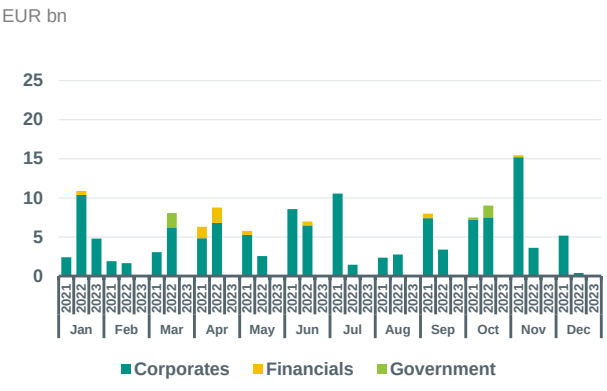
Source: Bloomberg, ABN AMRO Group Economics

Monthly Sustainability Bonds issuance by sector



Source: Bloomberg, ABN AMRO Group Economics

Monthly Sust.-Linked Bonds issuance by sector



Source: Bloomberg, ABN AMRO Group Economics

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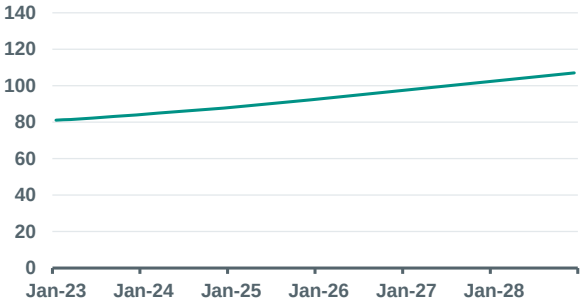
Carbon contract current prices (EU Allowance)

EUR/MT

Source: Bloomberg, ABN AMRO Group Economics

Carbon contract future prices (EU Allowance)

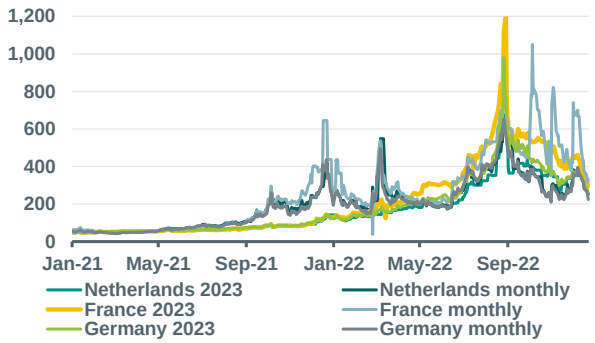
EUR/MT



Source: Bloomberg, ABN AMRO Group Economics

Electricity power prices (monthly & cal+1 contracts)

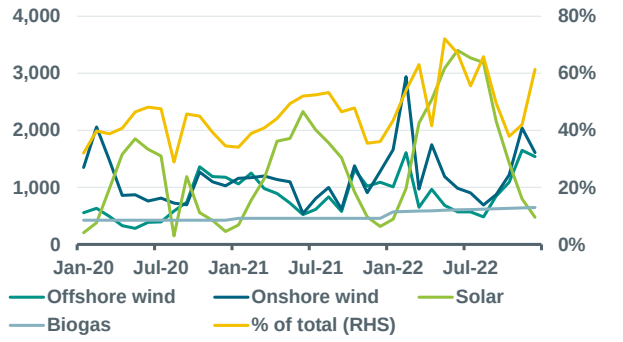
EUR/MWh



Source: Bloomberg, ABN AMRO Group Economics. Note: 2023 contracts refer to cal+1

Electricity generation from renewable sources (NL)

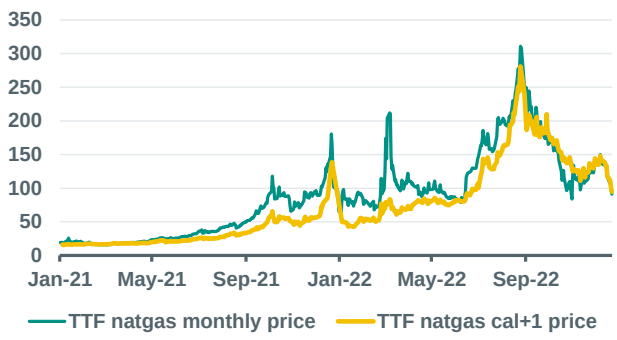
GW % of total



Source: Energieopwek (Klimaat-akkoord), ABN AMRO Group Economics

TTF Natgas prices

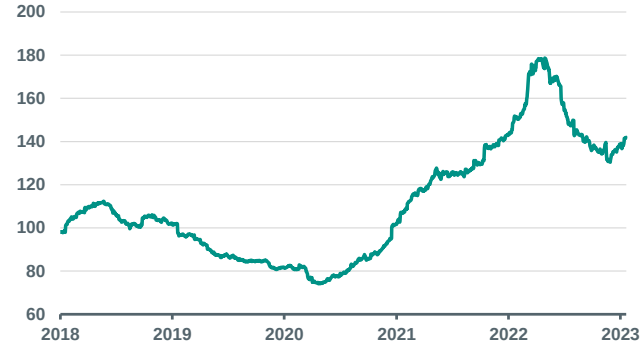
EUR/MWh



Source: Bloomberg, ABN AMRO Group Economics

Transition Commodities Price Index

Index (Jan. 2018=100)



Note: Average price trend of 'transition' commodities, such as: corn, sugar, aluminium, copper, nickel, zinc, cobalt, lead, lithium, manganese, gallium, indium, tellurium, steel, steel scrap, chromium, vanadium, molybdenum, silver and titanium. Source: Refinitiv, ABN AMRO Group Economics

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