

SustainaWeekly

More solar power generation in more prosperous municipalities

- ▶ **Economist:** In 2022, solar panel capacity of homes and companies in the Netherlands increased by an average of about 47%, but the share of renewable energy in total final energy consumption is still relatively low. Typically, the wealthier municipalities generate in most cases more solar power than less prosperous municipalities. Even though the affordability of solar panels has improved, it is still a substantial investment for many households.
- ▶ **Strategist:** The Green Bond Framework of the Dutch State has been updated and the expenditures are fully mapped against the EU Taxonomy. Moody's assessed the new framework as very good in a Second Party Opinion. The expenditures under the Delta fund programme now fully adhere to the EU Taxonomy. There are sufficient eligible expenditures available for the allocation of the proceeds to this issuance and taps in the coming years.
- ▶ **Policy & Regulation:** The ECB recently published the results of a pilot round of the Survey on the Access to Finance of Enterprises. The results indicate that 60% of firms attach more importance to transition risks than to physical risks. Only 24% of firms intend to invest in the next five years to reduce their climate footprint. Firms indicate that subsidised loans tend to be the preferred option to finance the green transition.
- ▶ **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.

Solar panel capacity of homes and companies in the Netherlands surged last year. Even though the affordability of solar panels has improved, it is still a substantial investment for many households. In this week's SustainaWeekly we first explore the relationship between the financial prosperity of municipalities and solar power production in those municipalities. In a separate note, we focus on the updated Green Bond Framework of the Dutch State and how the expenditures have been mapped against the EU Taxonomy. In our final note, we look at the outcomes of an ECB survey of euro area firms on how they look at physical and transition risks, their climate investment behaviour and financing sources and potential impediments to these.

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

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More solar power generation in more prosperous municipalities

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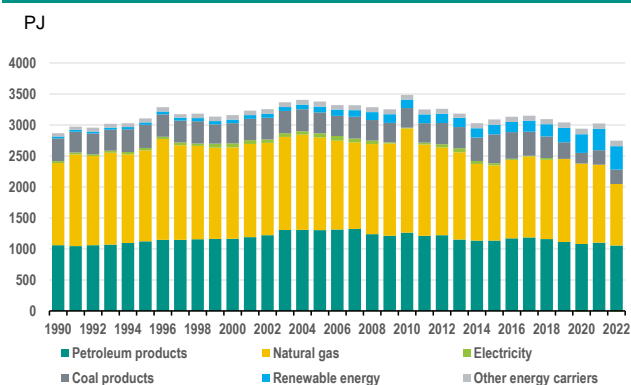
- ▶ In 2022, solar panel capacity of homes and companies in the Netherlands increased by an average of about 47%, but the share of renewable energy in total final energy consumption is still relatively low
- ▶ Although the dispersion is wide, a positive correlation can be seen between the financial prosperity of municipalities and solar power production
- ▶ Typically, the wealthier municipalities generate in most cases more solar power from their solar installations than less prosperous municipalities

When solar panels first hit the market, investment in them was largely limited to homeowners with above-average incomes. This has since changed. Over time financial accessibility - for middle and lower income groups - has become much better. Falling prices of solar installations, incentives and subsidies from the government and also better financing options are partly the reason for better financial accessibility. But the real snowball effect of the past two years was mainly caused by the sharp increase in the cost of living for many households, especially due to higher energy costs. It has led to a very sharp increase in installed solar installations and power in the Netherlands. In this, it is still mainly the richer municipalities that are in the lead. In this analysis, we further explore the trends in solar installations and how their distribution is to municipalities within the Netherlands, with a focus on the financial wealth of these municipalities.

Energy mix Netherlands still fossil rich

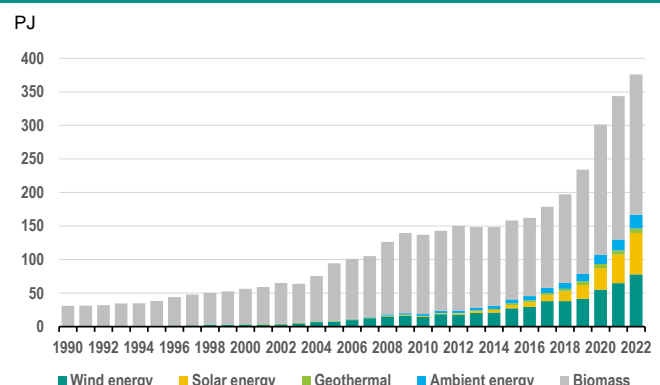
The difference between the level of total energy consumption in 1990 and in 2022 is relatively small. Compared to 1990, total energy consumption decreased by only 5%. It is only in the last 12 years that some more significant differences can be observed. For instance, since 2010 - the absolute peak in energy consumption after 1990 - total energy consumption has decreased by 22%. And in 2022, total energy consumption fell by 10% year-on-year, which, however, was mainly caused by a shock (due to the war in Ukraine and the energy crisis that followed later). In the overall energy mix, fossil fuels still have a large share, but the amounts consumed have decreased over the years. At first glance, the chart on the left below suggests that there is very little variation in fossil fuel consumption in amounts of PJ over the years in the underlying energy carriers. But appearances can be deceptive. For coal products and natural gas, consumption in 2022 compared to 1990 is 27% and 25% lower, respectively. In the case of petroleum products consumption, however, the quantities of PJ remained almost the same between 1990 and 2022. The share of petroleum in total energy consumption is also almost identical in 1990 and in 2022. However, the share of natural gas in total energy consumption has decreased from 46% in 1990 to 36% in 2022.

Energy balance – total energy consumption



Source: CBS, ABN AMRO Group Economics

Energy balance – total usage renewable energy



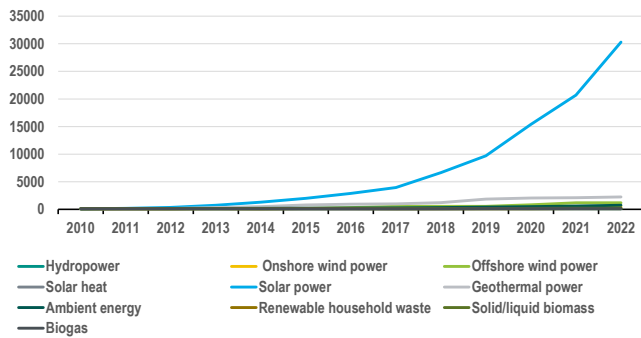
Source: CBS, ABN AMRO Group Economics

The chart on the left above shows that the share of renewable energy in total final energy consumption is still relatively low. In 2022, this share is 14%. The deployment of renewable energy has increased by as much as 1,106% between 1990 and 2022, an average growth rate of 8% per year. This is a positive trend and it is important to at least maintain this pace. The bottom line is that renewable energy capacity needs more exponential growth in the coming years to make the energy mix more sustainable and meet the EU commitment to generate at least 27% of total energy consumption from renewable

energy by 2030. The above figure on the right shows the trend in renewable energy and its sources separately. It shows that the share of solar power is still low compared to the other sources. However, the rate of growth of solar power has been many times stronger than that of other renewable energy sources. This is clearly shown in the left-hand figure below. Actually, the growth of almost all renewable energy sources since 2010 has been impressive, but that of solar power can be called exceptional. Growth has particularly accelerated in the last five years.

Evolution in energy supply renewable

index (2010=100)

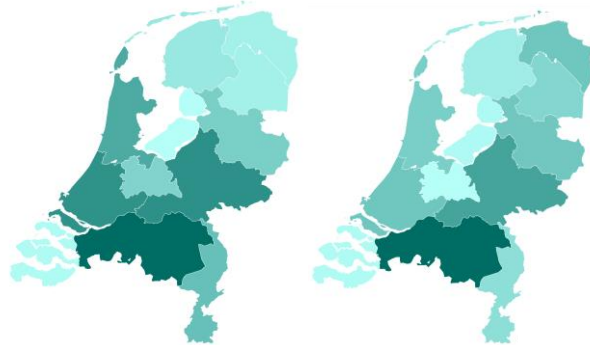


Source: CBS, ABN AMRO Group Economics

Solar power generation by province...

...by dwellings

...by economic activity



Source: CBS, ABN AMRO Group Economics

Note: the darker the colour, the higher the production of solar electricity

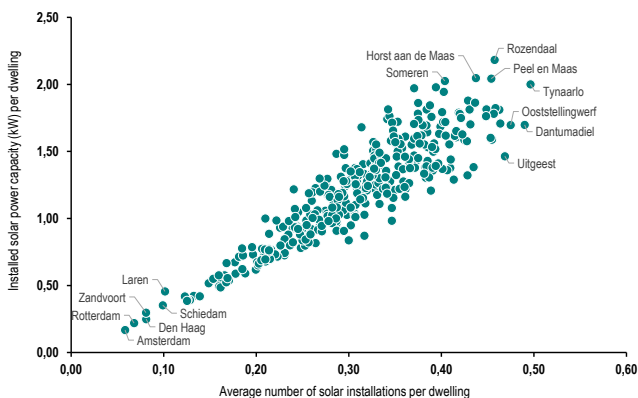
Over the past five years, solar electricity supply has increased by 356%, followed by ambient energy (heat extracted with a heat pump), which saw 125% growth over five years and wind energy (+121% over the same period). In solar electricity production, the province of North Brabant is the absolute solar king. This applies to production by both homes and companies. In 2022, the capacity of solar panels of homes and companies in the Netherlands increased by an average of about 47%. The provinces of Utrecht, South Holland and Zeeland saw the largest increase in residential solar power production. For companies, these were the provinces of Gelderland, Drenthe and Overijssel.

The sun no longer comes up for nothing

Of the 17 billion kWh of solar power in 2022, 59% is generated by companies. The remaining share (41%) comes from homes. For homes, the year-on-year growth in solar power generation was a fraction higher than the growth of solar power in companies (49% versus 45%). Obviously, when more solar panels are installed, solar power production increases correspondingly. This is also evident from the distribution of number of solar installations per dwelling and solar power per dwelling in the various municipalities (see chart on the left below). With a higher than average number of solar installations per dwelling and solar power per dwelling, the distribution increases more.

Solar installations & installed capacity per dwelling

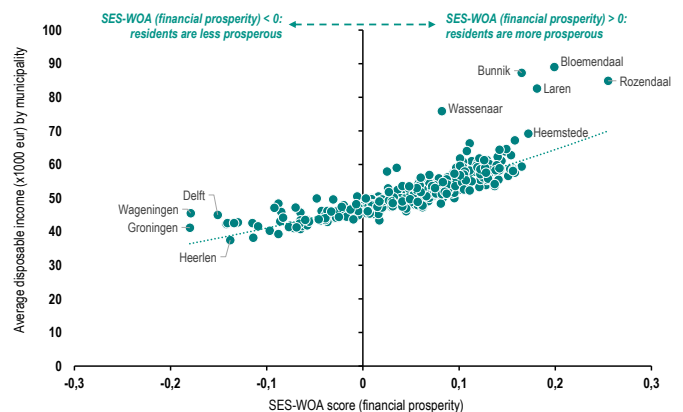
hor: solar installations/home; ver: solar power/home



Source: ABN AMRO Group Economics

Prosperity of Dutch municipalities

hor: SES-WOA financial prosperity score, ver: average spent ink. (x1000 eur)

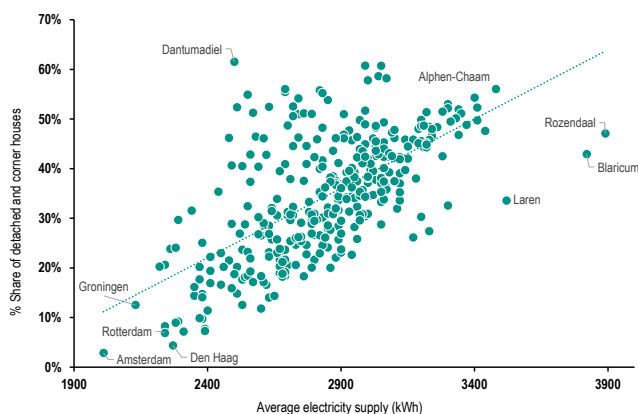


Source: CBS, ABN AMRO Group Economics

It goes without saying that a higher average disposable income results in higher financial prosperity. This financial prosperity varies across municipalities and is expressed by the CSB as a score. The indicator refers to both disposable income and household wealth. In general, if financial prosperity is relatively low, it is often a barrier for households to invest in renewable energy generation. Households in municipalities with higher average disposable income and assets (such as Rozendaal, Bloemendaal, Laren) are often able to make this kind of investment. Following this, it is interesting to see whether it is indeed true that households in municipalities with a higher share of high household incomes tend to invest more in solar power generation than households with a low score in terms of financial wealth (such as Groningen, Heerlen, Wageningen). There are different housing types, such as mid-terrace houses, corner houses, detached houses and flats. These homes all have different levels of electricity consumption. A mid-terrace house or a flat, for example, usually needs less electricity and energy than a corner or detached house. This is because an intermediate house or flat is often more compactly built than a corner or detached house. The left figure below shows - despite the fact that the variation is large in the data - that the higher the proportion of detached houses and corner houses in a municipality, the higher the average electricity deliveries¹ to these houses are. For example, the municipalities of Rozendaal and Blaricum have a relatively high proportion of detached houses and corner houses, and electricity deliveries in kWh are also relatively high in these places. But this need not always be the case. For the Frisian municipality of Dantumadiel has the largest share of detached houses and corner houses in the Netherlands, while the average electricity deliveries here are again relatively low. And finally, Amsterdam has the least number of detached houses and corner houses in the Netherlands, while the average electricity deliveries are the lowest in the whole of the Netherlands.

Number of detached houses and corner houses in Dutch municipalities vs electricity deliveries

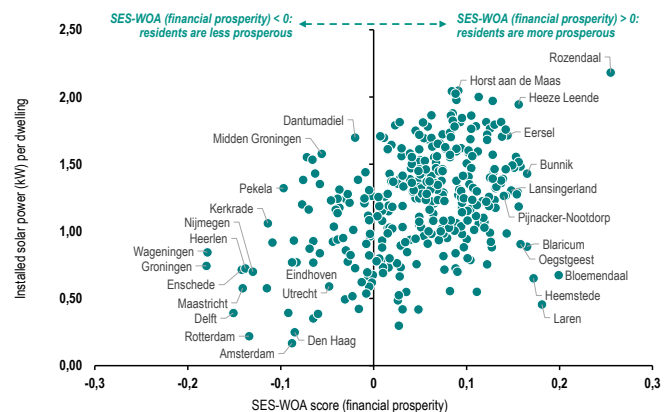
hor: average electricity supply; ver: % share of detached and corner houses



Source: CBS, ABN AMRO Group Economics

Solar power per dwelling by prosperity of Dutch municipalities

hor: SES-WOA financial prosperity score; ver: solar power per dwelling



Source: CBS, ABN AMRO Group Economics

There is a correlation between the financial prosperity of municipalities and the production of solar power. Typically, it is the wealthier municipalities that can generate a significant amount of solar power from their solar installations. This is partly because financial accessibility is much better for higher-income households than lower-income households. However, the spread is wide in the distribution of generated solar power by financial prosperity. For instance, some less wealthy villages and/or towns (such as Dantumadiel, Central-Groningen) already have a considerable number of roofs equipped with solar panels, and some wealthy villages and/or towns lag considerably behind (such as Laren) poorer villages and/or towns in harnessing solar energy potential. The data also shows that larger cities in the Netherlands (such as Amsterdam, Rotterdam and The Hague) have low solar panel density compared to smaller towns and villages. In larger cities, it is often much more difficult to create space for solar panels, than in outlying areas with typically more space and opportunities. All-in-all, financial considerations will remain an important factor for many households in whether or not to invest in solar panels in the future. Even though the affordability of solar panels has improved, it is still a substantial investment for many households. That is why financial incentives from the government are so important going forward to keep that investment within reach for both middle and lower income groups and to keep the pace in adding renewable energy to the grid.

¹ This is the gross electricity supply, i.e. without the netting of any feed-in to the electricity connection by generation from (mainly) solar panels.

Green expenditures of new 20y green DSL

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- ▶ **The Green Bond Framework of the Dutch State has been updated and the expenditures are fully mapped against the EU Taxonomy**
- ▶ **Moody's assessed the new framework as very good in a Second Party Opinion**
- ▶ **The expenditures under the Delta fund programme now fully adhere to the EU Taxonomy**
- ▶ **There are sufficient eligible expenditures available for the allocation of the proceeds to this issuance and taps in the coming years**

Introduction

On Tuesday 17 October, the DSTA will issue a new green bond, the DSL 15 January 2044 and this will be the second green bond the DSTA issues, following the issuance of the first AAA-rated green bond in 2019. In the run up to the auction, the Dutch State Treasury Agency (DSTA) updated its Green Bond Framework and it now adheres, according to the DSTA, to best market practises. In this note, we will focus on the updated framework, the assessment of the framework by Moody's as a Second Party Opinion and the categories of eligible expenditures that will be used from the proceeds of this new green DSL.

Delta Fund expenditures now fully mapped against EU Taxonomy under new Green Bond Framework

The DSTA published its Green Bond Framework in 2019 when it issued its inaugural green bond, the DSL 2040. Since then, significant developments in the field of sustainable finance have materialised resulting in an update of the framework in 2022 and in 2023. In this update, the DSTA aligned the framework with the EU Taxonomy Climate Delegate Act on a best effort basis² and became the first sovereign to do this.

On 8 September 2023, the DSTA published a new updated Green Bond Framework in the run up to the issuance of the new green bond, the DSL 2044. The framework is aligned with the existing EU Taxonomy as well as the upcoming EU Green Bond Standard, again on a best effort basis³. Furthermore, the new framework also aligns with the proposed EU Taxonomy criteria regarding flood risk prevention and protection, and nature-based solutions for flood and drought risk prevention and protection as published on 13 June 2023 by the European Commission. This means that, compared to the previous framework, the expenditures in the category 'Climate Change Adaptation & Sustainable Water Management' have been mapped against the amendments to the EU Taxonomy, which were released in June this year. As the new additions to the EU Taxonomy contain criteria for flood risk prevention and nature-based solutions for flood risk prevention, the Delta Fund expenditures are now fully mapped against the Taxonomy criteria. The Delta Fund programme has the aim to protect the Netherlands from flooding, to secure sufficient supplies of freshwater and to make the country climate-proof.

Second Party Opinion (SPO) from Moody's

The DSTA has appointed Moody's as a SPO for an external review of the Green Bond Framework following a tender amongst interested parties. The assessment focused in particular on whether the Framework is aligned with the ICMA Green Bond Principles (2021, with June 2022 Appendix I), adheres to the EU Taxonomy Climate Delegate Act (June 2021) and to the proposed analysis of the coherence of the framework with overall national policies and action plans (Environmental Delegated Act, June 2023)⁴.

Moody's has assigned a Sustainable Quality Score of 'Very Good' (SQS2) to the Government of the Netherlands' green bond framework (see graph below). As shown in the second party opinion report, the framework is aligned with the core components of the ICMA Green Bond Principles 2021 (including the June 2022 Appendix 1) and demonstrates a high overall contribution to sustainability. In addition, Moody's considers that 11 out of 12 economic activities adhere to all the EU Taxonomy criteria relating to both substantial contribution and do-no-significant-harm (DNSH), based on information provided by the Dutch State. For the economic activity where this was not fully possible (transport by motorbikes, passenger

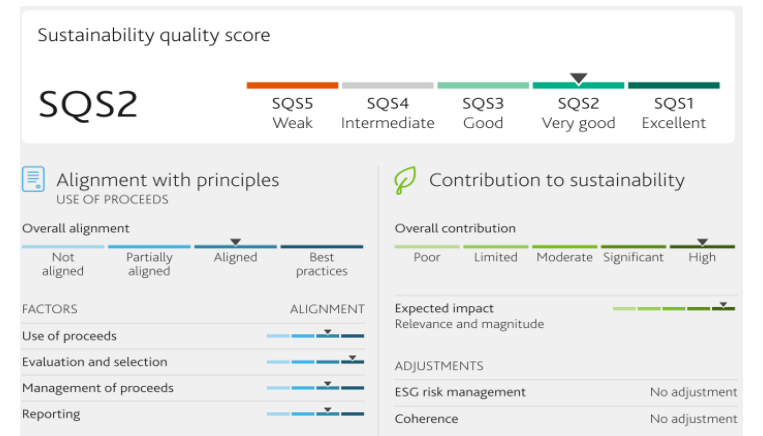
² European Commission – EU Taxonomy Climate Delegated Act (June 2021, 4 June 2021 (available [here](#)))

³ Draft overall compromise package for the EU Green Bonds regulation (available [here](#))

⁴ Second Party Opinion Moody's on Government of Netherlands (available [here](#))

cars and light commercial vehicles), it is considered that all criteria adhere to the EU Taxonomy, except for the pollution prevention control and DNSH criterion.

Moody's assessment of DSTA's Green Bond Framework



Source: Moody's, DSTA

Use of proceeds

The proceeds from the green bonds issued by the Dutch State are intended to exclusively finance or refinance expenditures, which are part of the Central Government Budget or tax relief measures which are included in the Budget Memorandum (Miljoenennota) and contribute to the EU Environmental Objectives of Climate Change Mitigation and Climate Change Adaptation ('Green Expenditures') and Sustainable use and protection of water and marine resources ('Blue Expenditures').

The eligible expenditures are limited to Central Government Budget expenditures in the budget year preceding the issuance, the budget year of issuance and the two years following the issuance. The DSTA intends to allocate at least 50% of the net proceeds of the issuance to expenditures in the budget year of issuance or future budget years.

The Dutch State included four categories of eligible expenditures, which are also mapped to the Green Bond Principle categories, the relevant UN Sustainable Development Goals (SDGs) as well as Economic Activities and Environmental Objectives under the EU Taxonomy. The four categories are:

- Renewable Energy
- Energy Efficiency
- Clean Transportation
- Climate Change Adaptation & Sustainable Water Management

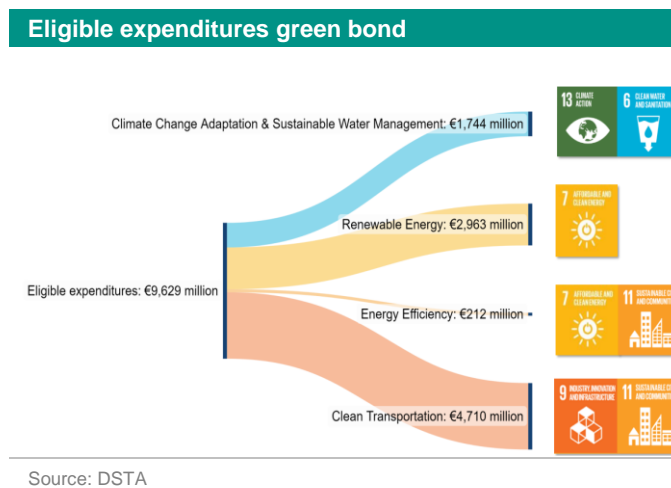
In total, the DSTA has identified EUR 9.6bn of expenses that meet all the eligibility criteria in the Central General Budget of 2022 and 2023, implying that sufficient expenditures can be allocated to the proceeds of the upcoming issuance of EUR 5bn of the DSL 2044. However, this amount is the sum of all the planned expenditures that have been found in the General Budget of the 2022 and 2023 and therefore represents the maximum amount that can be allocated to the proceeds of the green bond issuance on 17 October. In practice, this number will be lower and perhaps even significantly lower as some of the projects will be postponed due to tight labour market conditions, while other expenditures will not take place due to other developments. For example, the direct investment of the Dutch State of around EUR 1bn in TenneT, the Transmission System Operator for the Netherlands, could be cancelled if the sale of the German part of TenneT would take place next year. Furthermore, the actual subsidies for renewable energy generation (via the SDE subsidies) have been substantially lower in 2023 than what was budgeted due to the higher energy prices in 2023. As such, the actual eligible expenditures will be significantly lower than the total of EUR 9.6bn, but there will remain still sufficient eligible expenditures for this new issuance of the DSL 2044. Furthermore, as there will be new eligible expenditures available from the Central Government

Budget in 2024 and beyond, there will be sufficient expenditures available to tap the new green DSL 2044 in the coming years.

As can be seen in the graph below, almost half of the eligible expenses (EUR 4.7bn) are in the Clean Transportation category of which the lion's share comes from railway-related expenses, including maintenance and management of railway infrastructure (excluding freight railway infrastructure). This category also includes (re)development of railway stations and bicycle parking space at railway stations.

The second biggest part of the total eligible expenditures is the Renewable Energy category, including the SDE subsidies for generating renewable energy and the possible direct investment of the Dutch State in TenneT. New on the list is the support of the production and transportation of hydrogen.

Finally, the expenditures related to the Delta fund programme are linked to the Climate Change Adaptation and Sustainable Water Management category.



European firms tend to consider transition risks more important than physical risks

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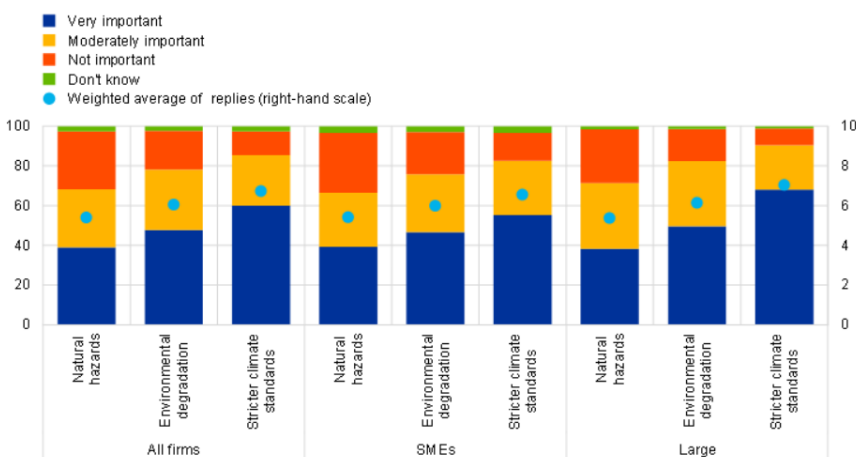
- ▶ The ECB recently published the results of a pilot round of the Survey on the Access to Finance of Enterprises (SAFE). For the first time, the survey included questions regarding climate change
- ▶ The results indicate that 60% of firms attach more importance to transition risks than to physical risks
- ▶ Physical risks tend to be of higher importance to regions, which have recently experienced wildfires or other physical threats
- ▶ Only 24% of firms intend to invest in the next five years to reduce their climate footprint
- ▶ Firms indicate that subsidised loans tend to be the preferred option to finance the green transition

The European Central Bank (ECB) recently published the results of a pilot round of the Survey on the Access to Finance of Enterprises (SAFE), which took place between 25 May and 26 June this year (see [here](#)). For the first time, the survey included questions regarding the impact of climate change on euro area firms. The questions related to:

- The importance that euro area firms attach to the consequences of physical and transition risks;
- Euro area firms' behaviour to mitigate risks or reduce the negative environmental impact of their economic activities;
- Different financing sources chosen to fund climate change-related investments;
- Potential impediments to the necessary financing.

Regarding answers to the first question, 60% of all firms indicated that transition risks related to stricter climate standards (e.g., regulation, carbon pricing) are very important for them, while only 39% of the respondents are very concerned about the physical risks of climate change, (e.g., natural hazards). This might be related to the fact that it is easier for firms to assess and quantify the costs were governments to introduce (further) measures to stem climate change, than to calculate the likelihood and consequences of a natural disaster hitting their firms.

Low Carbon Transition Rating Emissions Projections



Source: European Central Bank.

Furthermore, physical risks were perceived as being of higher importance for coastal areas or regions where the occurrence of wildfires has been more frequent. Moreover, regions that heavily rely on tourism, or heavy industries, are also among those that consider physical risk as being of high importance. On the other hand, transition risk is more uniformly distributed across euro area regions.

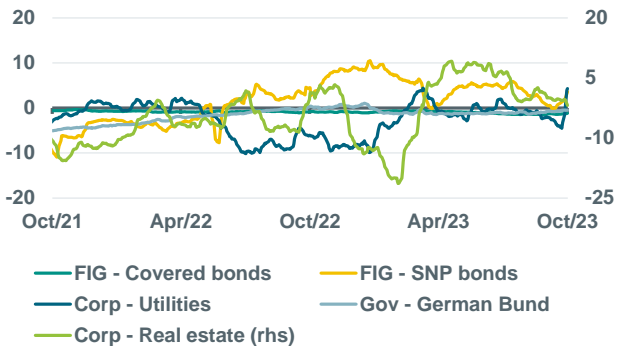
Meanwhile, in a response to the second question, half of euro area firms judged that they had already sufficiently invested to reduce their climate footprint, with 24% of firms planning to invest within the next five years. This comes a bit as a surprise, given recent reports indicating how companies are falling short of their goals – including needed investment - in order to comply with an emission pathway consistent with the 1.5 degrees Celsius goal of the Paris Agreement. It also compares strangely with the amounts needed to meet the climate objectives. In any case, it suggests that many companies might be rather complacent on this matter.

Finally, concerning the sources of financing that firms use to fund the green transition, subsidised loans seem to be the most relevant source of funding, next to non-subsidised loans and retained earnings. This is particularly true for SMEs. Among the obstacles of climate-related investments, euro area firms mentioned high interest rates and financing costs as the most relevant ones. Furthermore, investors also pointed out to the high environmental reporting costs and a lack of investors' willingness to finance green investments. These obstacles are even more exacerbated for SMEs. However, this issue could probably partly be solved by an increase in public guarantees, which will likely accelerate the climate transition process for firms.

ESG in figures

ABN AMRO Secondary Greenium Indicator

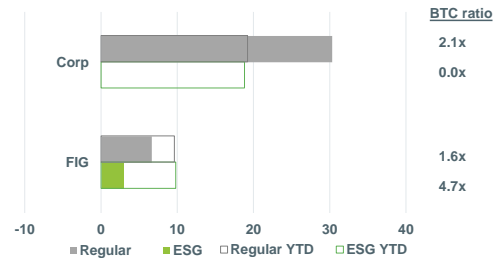
Delta (green I-spread – regular I-spread)



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 29-09-23. BTC = Bid-to-cover orderbook ratio. Source: Bloomberg, ABN AMRO Group Economics

Sustainable debt market overview

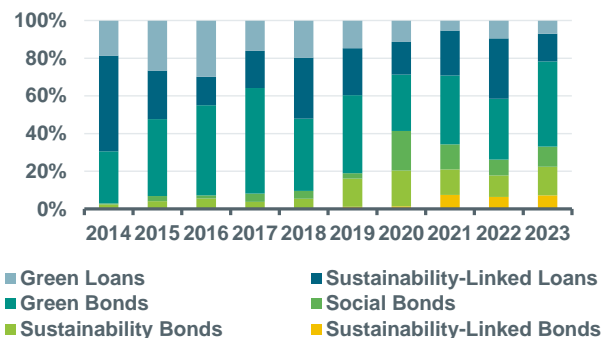
EUR bn



Source: Bloomberg, ABN AMRO Group Economics

Breakdown of sustainable debt by type

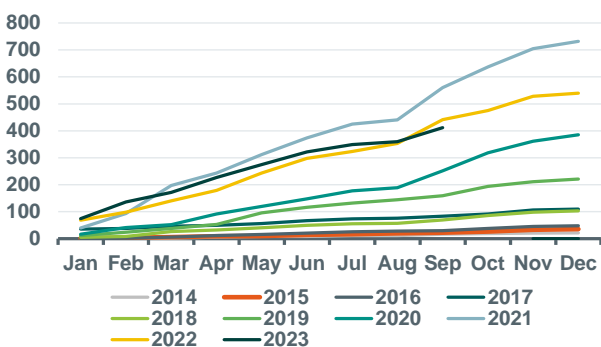
% of total



Source: Bloomberg, ABN AMRO Group Economics

YTD ESG bond issuance

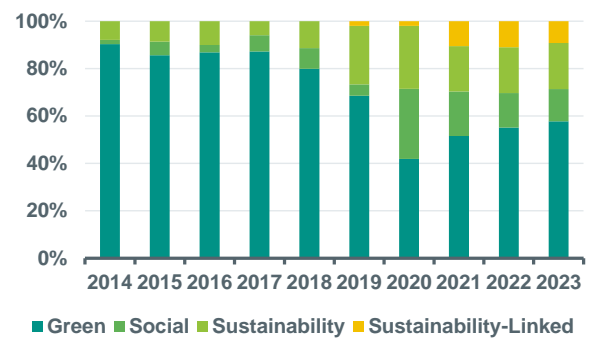
EUR bn (cumulative)



Source: Bloomberg, ABN AMRO Group Economics

Breakdown of ESG bond issuance by type

% of total

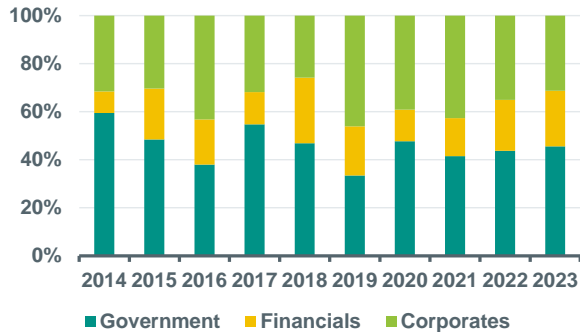


Source: Bloomberg, ABN AMRO Group Economics

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

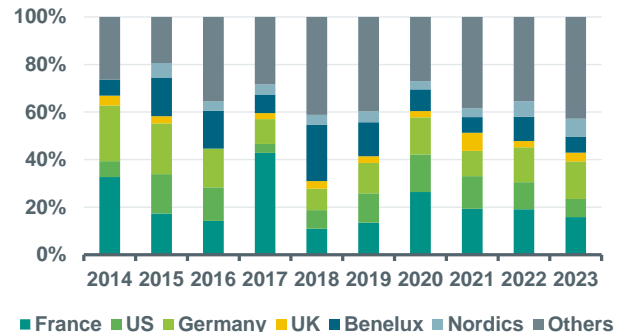
% of total



Source: Bloomberg, ABN AMRO Group Economics

Breakdown of ESG bond issuance by country

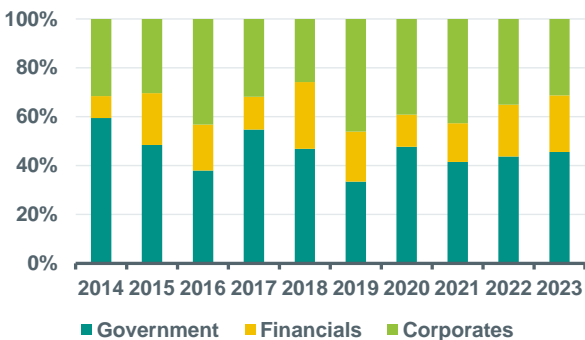
% of total



Source: Bloomberg, ABN AMRO Group Economics

Monthly Green Bonds issuance by sector

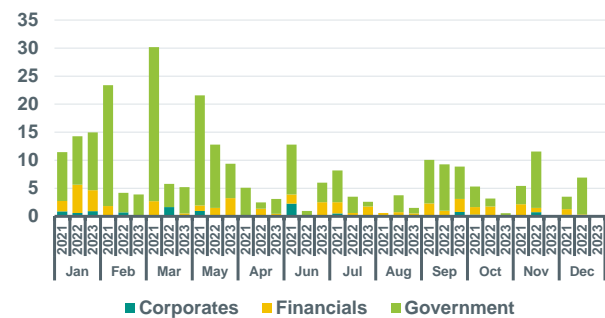
EUR bn



Source: Bloomberg, ABN AMRO Group Economics

Monthly Social Bonds issuance by sector

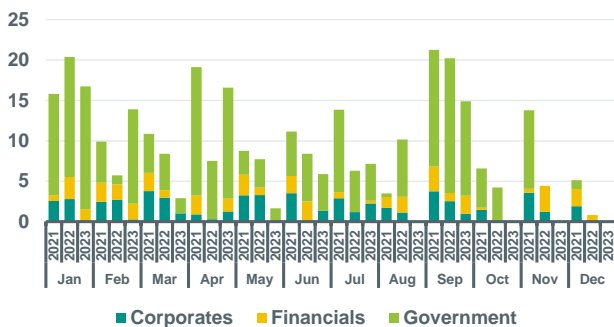
EUR bn



Source: Bloomberg, ABN AMRO Group Economics

Monthly Sustainability Bonds issuance by sector

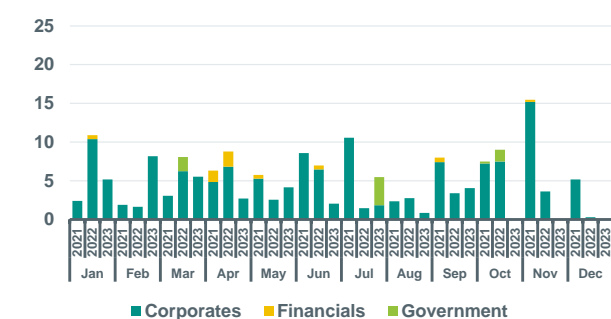
EUR bn



Source: Bloomberg, ABN AMRO Group Economics

Monthly Sust.-Linked Bonds issuance by sector

EUR bn



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.

Carbon contract current prices (EU Allowance)

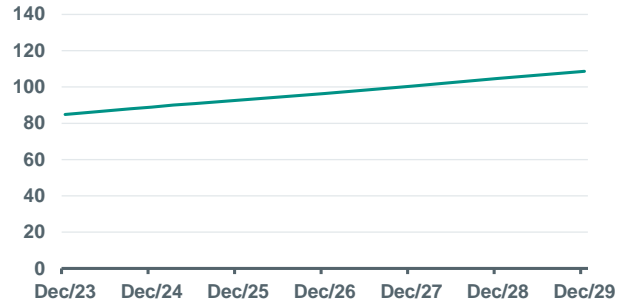
EUR/MT



Source: Bloomberg, ABN AMRO Group Economics

Carbon contract futures curve (EU Allowance)

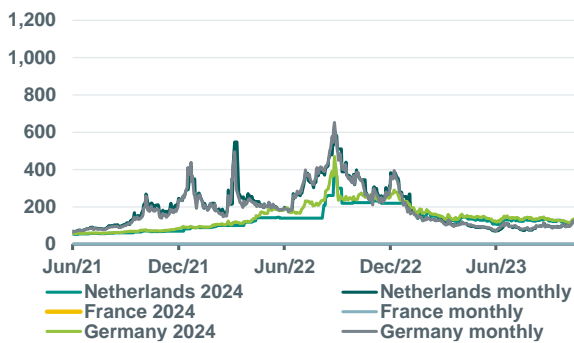
EUR/MT



Source: Bloomberg, ABN AMRO Group Economics

Electricity power prices (monthly & cal+1 contracts)

EUR/MWh

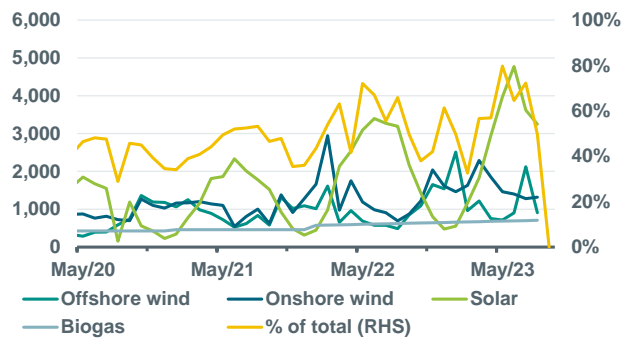


Source: Bloomberg, ABN AMRO Group Economics. Note: 2024 contracts refer to cal+1

Electricity generation from renewable sources (NL)

GW

% of total



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

TTF Natgas prices

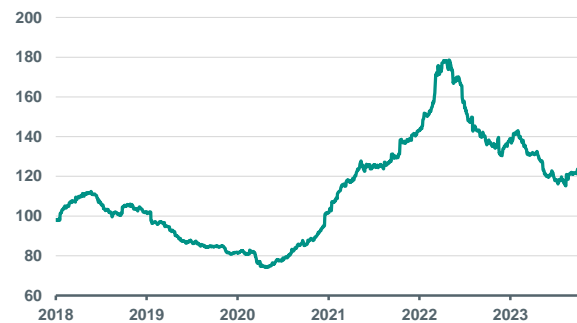
EUR/MWh



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

DISCLAIMER

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