SustainaWeekly

How are companies coping with higher energy costs?

- **Economics Theme: The theoretical profit margin impact for rated corporates of soaring energy prices would have been large, yet so far energy-hungry companies have been very adept in passing higher costs to their customers. However, we argue that given the downturn in demand and the persistence of cost rises, a margin crunch is on the cards.**

- **Strategy Theme: We assess whether the green bonds of utility generators have contributed to the decarbonization of Europe. Our analysis shows a clear relationship between green bond issuance by utility companies and the increase in renewable energy capacity in Europe. We highlight differences in terms of impact reporting between companies.**

- **Sectors: The transition towards a less polluting way of producing steel is gaining traction. High electricity prices are currently hurting many EAF steel producers in particular, and this is harming their competitiveness. In the long run, a more sustainable production process will be decisive for business continuity and will ultimately shape competitiveness.**

- **ESG Bonds: New issuance premiums (NIP) for corporates and financial institutions have been on the rise in the past few months. We investigate whether the green label might have assisted issuers in securing a lower NIP. Following the outbreak of the Russia-Ukraine war, this was not the case, though more recently there are better signs for corporates than FIs.**

- **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 our first edition of the SustainaWeekly after the summer break, we cover a wide range of topics. We first have updated our analysis on how surging energy costs have impacted company margins. Companies have so far been quite successful in protecting their margins, though we judge that this is unlikely to be the case going forward. We go on to review impact reporting from utility companies in Europe, look at decarbonisation of the steel sector and assess the impact of the green label on bond new issue premiums. Enjoy the read and, as always, let us know if you have any feedback!

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Company profits survive energy crunch – but not for long

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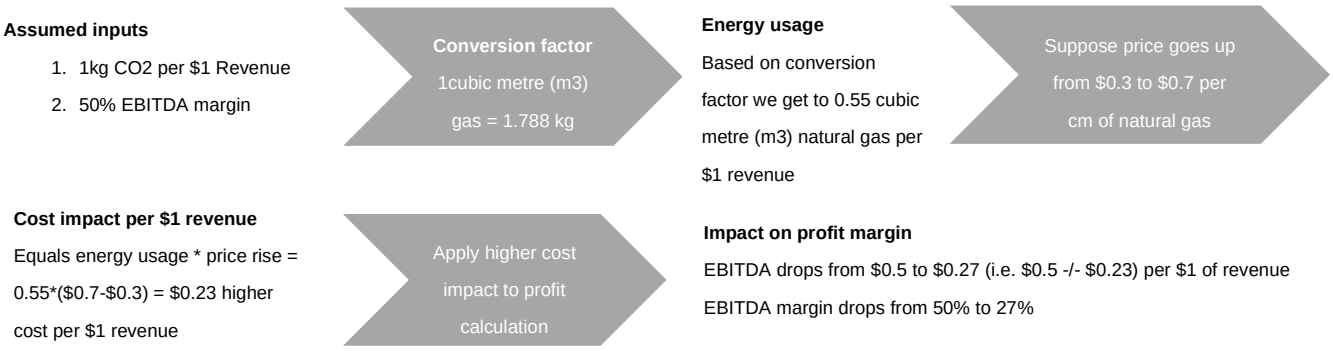
- **The advent of ESG disclosures makes it possible to derive energy use at rated corporates and also allows us to calculate a theoretical profit margin impact based on the rise in energy prices seen this year**
- **The theoretical impact would have been large, yet so far energy-hungry companies have been very adept in passing higher (energy) costs to their consumers**
- **But there is a limit to this pass-through ability. Plummeting consumer sentiment and depleted excess savings will make future price hikes very challenging, while energy prices have continued to crawl upwards and are set to remain high**

In March this year we started showing how much large company profit margins were exposed to the energy crunch (see here). A company's disclosed carbon intensity allowed us to reverse-engineer energy usage per unit of revenue and by combing this with how much the price of fuel or electricity had risen it also allowed us to calculate the impact on profit per unit of revenue. We illustrate this approach in the flow-chart below:

How do we get from carbon data to financial impact from higher energy prices– an example



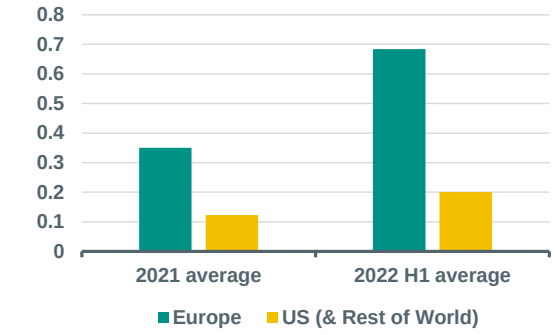
Since our March publication energy prices have continued to rise strongly and last week we even saw the 1y German electricity contract price briefly touch EUR 1,000 per MWh. Therefore we felt it was the perfect time for an update on the **potential** profit impact from higher energy prices, also considering how actual profits have eveloved since the start of this year given that the H1 earnings season is also behind us. We say potential as this would assume no remedy such as pass through of costs is available. In reality this pass-through has taken shape, which we shall show later.

Our focus is on European corporates which have bonds outstanding in the EUR IG corporate index and operate in energy intensive sectors. We arbitrarily classify a sector as being energy intensive when the combined scope 1 & 2 intensity is above 20 tonne CO2 per $1mn of revenues. We assume that natural gas is the key fuel driving the scope 1 emissions for a majority of issuers, as we have checked, unless there is an obvious alternative (such as diesel for the transportation industry). The price difference for natural gas is material between Europe and the rest of the world (for which we assume US prices) and European natural gas prices have obviously gone up much more since the start of this year. Depending on how much revenue an issuer makes in Europe we use the more expensive European gas price as input, otherwise we stick with US prices. With regards to electricity usage derived from scope 2 emissions, we also take into consideration the difference in the electricity mix between Europe and the US (again, we take the US as a proxy for the rest of the world). This actually implies a much stronger use of electricity in Europe, given the larger penetration of carbon free electricity sources.

As in our previous excercise, we leave out the power generation/transport, energy and real estate sectors from our analysis, since they either are the beneficiary of high energy prices, or have zero or limited own energy usage, or given the existing supply shortage of electricity installations, should have no difficulties in passing through higher fuel costs in power rates.

Gas prices used in our calculations

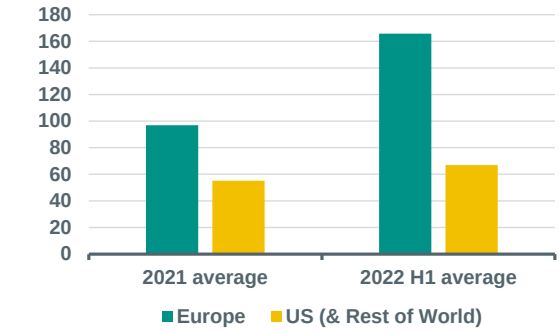
USD per M3



Source: Bloomberg, ABN AMRO Group Economics

Electricity prices used in our calculations

USD per MWh



Source: Bloomberg, ABN AMRO Group Economics

Passing through higher energy costs a piece of cake so far…

We managed to put together carbon, revenue (2021 & H1 2022) and EBITDA (2021 & H1 2022) data for roughly 80 European issuers, which is a decent sample (close to half of total universe). The reason why we selected only European issuers is to confirm whether corporates with a large presence in the region as a whole would underperform, for example, because of a higher expected impact from sky-rocketing European energy prices due to the presence of their operations in Europe.

The conclusion however is that so far the European issuers have managed to pass-though higher costs quite successfully. The 80 issuers come from a variety of heavy energy usage sectors, such as airlines, transport, chemicals and steel production. The table below lists 16 issuers where, in case pass-through of energy costs was impossible, the decline in EBITDA margin would have been in excess of 5%. In some cases profitability would have been entirely (or close to entirely) wiped out, such as at German chemical giant **Evonik**, or Finish paper company **UPM**.

Theoretical EBITDA margin pull down from higher energy prices, in some cases extremely

Issuer	Industry	Share of Europe in business	Key Fuel Scope 1	Fuel Volume	Scope 1 (tonne kg per 1mn USD revs)	Margin hit fuel per 1mm USD revs	Scope 2 (tonne kg per 1mn USD revs)	Margin hit electricity per 1mm USD revs	Total margin hit per 1mn USD revenues	EBITDA margin 2021	Revenues 2021 USD mn	Cash operating costs 2021 USD mn	**Pro-forma EBITDA margin***	Pro-forma margin decline*	**Actual H1 2022 EBITDA margin**
Linde	Chemicals	25%	Natgas	M3	596	47,115	738	227,321	274,436	**30.4%**	30,793	21,437	**2.9%**	27.5%	**28.4%**
Air Liquide	Chemicals	35%	Natgas	M3	597	55,715	499	197,654	253,369	**27.1%**	27,600	20,110	**1.8%**	25.3%	**25.4%**
ArcelorMittal	Steel	55%	Coking Coal	MT	2471	141,467	166	94,923	236,390	**25.3%**	76,571	57,167	**1.7%**	23.6%	**25.1%**
Evonik	Chemicals	50%	Natgas	M3	313	35,940	364	191,884	227,824	**16.0%**	17,688	14,858	**-6.8%**	22.8%	**15.1%**
UPM-Kymmene	Forestry/Paper	60%	Natgas	M3	257	33,258	257	158,172	191,429	**19.7%**	11,608	9,323	**0.5%**	19.2%	**19.7%**
Covestro	Chemicals	43%	Natgas	M3	95	10,005	342	159,346	169,351	**19.4%**	18,810	15,153	**2.5%**	16.9%	**16.1%**
Metsa Board	Packaging	70%	Natgas	M3	109	15,632	162	113,619	129,251	**15.5%**	2,465	2,082	**2.6%**	12.9%	**18.0%**
LYB International	Chemicals	20%	Natgas	M3	555	39,849	314	82,848	122,696	**19.9%**	46,173	36,965	**7.7%**	12.2%	**16.8%**
Lanxess	Chemicals	50%	Natgas	M3	171	19,619	173	91,065	110,684	**13.3%**	8,938	7,749	**2.2%**	11.1%	**12.5%**
AP Moller-Maersk	Transport	15%	Diesel	litre	794	105,843	7	1,587	107,430	**38.9%**	61,787	37,750	**28.2%**	10.7%	**45.9%**
Norsk Hydro	Metals/Mining	50%	Natgas	M3	455	52,294	99	52,308	104,603	**17.8%**	17,416	14,322	**7.3%**	10.5%	**19.2%**
Mondi	Packaging	75%	Natgas	M3	453	68,328	47	35,085	103,413	**19.5%**	9,135	7,356	**9.1%**	10.4%	**20.2%**
Solvay	Chemicals	30%	Natgas	M3	749	64,536	101	35,546	100,082	**20.4%**	13,525	10,769	**10.4%**	10.0%	**21.9%**
Stora Enso	Forestry/Paper	70%	Natgas	M3	208	29,929	78	55,088	85,017	**20.5%**	12,022	9,559	**12.0%**	8.5%	**21.3%**
Arkema	Chemicals	35%	Natgas	M3	265	24,706	114	45,238	69,944	**18.8%**	11,259	9,144	**11.8%**	7.0%	**22.3%**
Essity	Forestry/Paper	55%	Natgas	M3	97	11,821	88	50,431	62,253	**17.6%**	14,209	11,712	**11.3%**	6.3%	**13.7%**

Source: Sustainalytics, Bloomberg, ABN AMRO Group Economics. *Assuming that company has to fully bear cost of higher energy prices

But when we look at how much actual EBITDA margin these companies reported recently (final column) it seems that **so far pass-through of higher costs has been a piece of cake**. On average we see only 0.4% negative deviation between the EBITDA margin at the end of 2021 and June 2022 (both on a 12 month basis) for the full sample. In 34 out of the 80 total

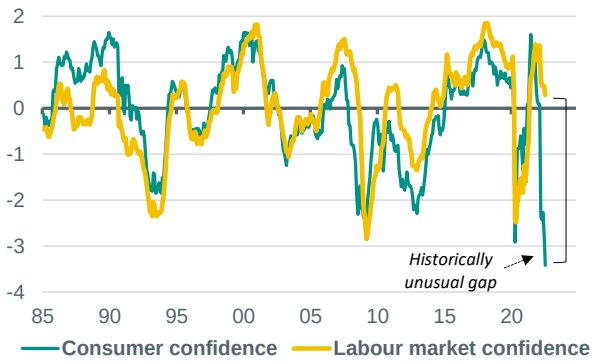
cases the companies even experienced EBITDA margin expansion from last year and only in 17 cases did we see margin contraction in excess of 2 percentage points.

…but consumer pull-back could start to bite soon

Corporates have shown remarkable pricing power and we had actually expected this to crumble in the first half of this year already. Perhaps we under-estimated the (European) consumer base, which basically did not turn down demand as much as prices have risen. This could change soon. Firstly, consumer confidence has recently dropped to unprecedented levels, surpassing the troughs seen during the great financial crisis, Eurozone debt crisis and the early stages of the pandemic. The chart on the left on the next page also shows that consumer confidence and labour market confidence go hand-in-hand, suggesting that unemployment is bound to tick up considerably as well, which obviously will make consumers even more cautious. Also, the chart on the right shows that excess savings accrued during the pandemic have nearly dried-up and based on our macro-economic projections could soon fall below trend (which could perhaps also explain the sour mood expressed by consumers currently). Indeed, we expect the eurozone economy to experience a recession.

European consumer confidence has plummeted

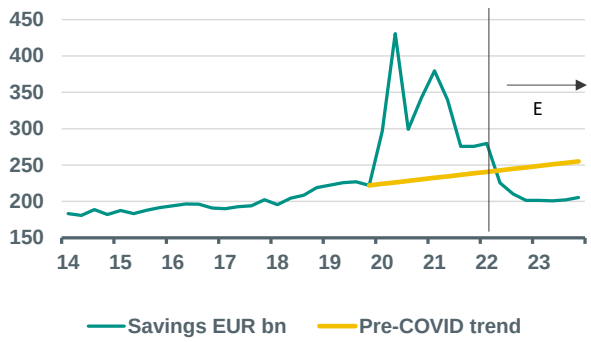
Standardised index (eurozone)



Source: Refinitiv, ABN AMRO Group Economics

Eurozone excess savings have dried-up

Eur Bn



Source: Refinitiv, ABN AMRO Group Economics

Finally, things are loosening again quickly in terms of supply-chains, which should increase price competition amongst companies, and obviously exert pressure on profit margins. With energy prices set to remain high, the likelihood for corporates to continue margin protection will become very challenging and we have likely seen a peak in profit margins. Companies have so far survived the energy crunch – but not for long.

A review of impact reporting from utility companies in Europe

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- **In this summary from a more in-depth piece, we highlight our main findings in terms of green bond impact reporting from utility generators in Europe**
- **Overall across the entire utility sector, there seems to be large differences in terms of methodologies, which might make comparison amongst issuers challenging for investors**
- **This summary includes also our main findings in terms of whether green bonds have contributed to the decarbonization of Europe**
- **Our analysis shows that there seems to be a clear relationship between green bond issuance by utility companies and the increase in renewable energy capacity in Europe**

This piece is a summary of a more extensive note to be published soon in our ESG Strategist series.

Most of the scrutiny around green bonds is undertaken during the issuance process. Post-issuance reporting, such as on the environmental impact, are sometimes overseen by investors. With that in mind, we have taken a look at the green bond impact report issued by utility companies. While our extensive note focuses on utilities across different sub-sectors, for the purpose of this summary we will touch upon exclusively the methodology from pure generators.

Environmental impact methodology

We start our analysis by taking a close look at how the environmental impact was assessed by our selection of utility generator companies. Given the nature of their business, utility companies usually rely on a carbon footprint indicator. Hence, we have taken a look at how the CO2 avoidance of the financed projects has been measured. The table below briefly summarizes the methodology used by the companies in our sample. What immediately stands out from the table is the difference being applied by issuers in terms of reporting. Companies make different assumptions, as well as use different emission factors to calculate their CO2 avoidance.

Generators

General methodology	Methodology for electricity production	Methodology for emission factor	Companies
CO2 emissions avoided is calculated by multiplying the electricity production from renewables with the average emission factor within a country.	Electricity production is estimated using forecast figures (e.g. the "P50")	Emission factors take into account the energy mix within a certain country.	EDF
	Electricity production refers to the actual production		ERG, Scatec, Verbund
	Electricity production refers to the actual production (if project is completed) or estimated using forecast figures (e.g. the "P50") if project under construction		Orsted
	Electricity production is estimated by using a certain conversion factor per MW of installed capacity		Vattenfall
	Electricity production refers to the actual production (if project is completed) or estimated using forecast figures (e.g. the "P50") if project under construction	Emission factor of approx. 400g CO2/KWh (source is not disclosed)	RWE

However, generator utility companies divergence in terms of methodology is lower when compared to DSO/TSOs and/or integrated companies. The largest differences come from either companies that look at exclusively at the actual production from their renewable energy assets and/or whether they also use forecasted values such as the “P50” (that is, a forecasted average production that is expected to be exceeded with a 50% probability). The choice to use one figure or the other depends mostly on whether the project is concluded (active) or not (yet). The exception in this case is Vattenfall, that uses a certain conversion factor (for example, 2.6 GWh per MW installed for onshore wind) in order to convert installed capacities to energy output. We highlight that Vattenfall also does not transparently disclose the source of these conversion factors.

In the table on the next page, we have summarized our findings in terms of (renewable) energy production, reported CO2 avoidance, corresponding implied (all-in) emission factor, as well as a figure of CO2 avoidance per GWh per EUR 1m invested in green bonds. The CO2/GWh figure allows us for a better comparison between companies, as some may have a higher absolute CO2 avoidance figure, but this is only a result of a larger amount of electricity production. The comparison also in terms of ‘per EUR 1m invested’ also allows us to control for issuers that might have issued many green bonds (and

have therefore higher renewable energy generation and subsequent higher CO2 avoidance). This figure also gives us therefore a better understanding of where investor's money (that is, flat at EUR 1m) would yield the highest impact (in terms of CO2/GWh).

	RES Generation (GWh, py)	Emission factor (tonnes/GWh)	CO2 avoidance (tonnes)	CO2 per 1m/GWh*
Scatec Solar ASA	3,713	510.64	1,896,000	2.07
Verbund AG	370	766.38	283,560	1.53
ERG S.p.A.	1,450	622.76	903,033	0.74
Vattenfall AB	8,139	318.23	2,590,000	0.25
RWE	2,253	399.91	901,000	0.18
Orsted AS	10,166	319.40	3,247,000	0.08
EDF	15,040	430.85	6,480,000	0.06

**Refers to the CO2 avoidance (tonnes) per EUR 1m invested in green bonds per GWh of electricity transported/produced*

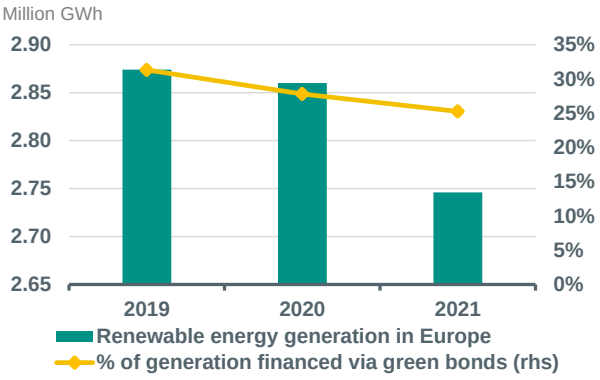
The table above allows us to derive the following conclusions:

- Scatec Solar has the highest impact in terms of CO2 avoidance per EUR 1m per GWh. The significantly higher figure (also compared to DSO/TSOs), is mostly driven by the fact that Scatec managed to finance a significant amount of CO2 avoidance with a relatively small portfolio of eligible assets (to put in perspective: Scatec financed 3,713 GWh of renewable energy with a portfolio of ca. EUR 250m, while RWE financed around 1,000 GWh less in terms of generation with a portfolio of EUR 2.3bn, which is significantly higher than Scatec). In that sense, good to mention that while RWE invests almost exclusively in wind, Scatec Solar's investments are either exclusively towards hydro or solar. According to BNEF, the cost of production of 1MW of wind is around USD 0.93m, while for solar this is almost half, at USD 0.45m (as per 2H21, excl. installation costs). This is largely due to the metals composition of wind vs solar, where wind relies more on aluminium (where prices reached all-time highs in 2021) while solar relies more on iron. Hence, the higher energy production vis-à-vis a lower portfolio of eligible assets could be (at least partially) attributed to the nature of the renewable energy source.
- Verbund has the second highest impact in terms of CO2 avoidance per EUR 1m per GWh, and that seems to be mostly attributed to its higher implied emission factor compared to peers – that is, a large CO2 avoidance figure from a relatively small renewable energy generation. As it was with E.ON, Verbund is largely present in Germany and Austria, whose energy mix still rely heavily on fossil fuels, which can explain the higher emission factor.
- Also ERG reports an implied higher emission factor. Contrary to other peers, ERG discloses for each project the actual production as well as emission factor used, which allows us to analyse that indeed, the higher factor comes from projects located in Germany (emission factor: 749) and Poland (emission factor: 856).
- Hence, the table above leads us conclude that besides Scatec, the majority of the other companies' impact in terms of CO2 avoidance per EUR 1m per GWh is mostly driven by the emission factor used. This also means that largely the relative size of eligible portfolios is the same, with the largest difference coming instead from the emission factor. Hence, for generators, a company with operations in countries that still rely more heavily on fossil fuel will also yield a higher impact. We note of course that also the fact that some companies use forecast production figures (e.g. EDF and RWE) can also drive the lower impact despite relatively higher emission factors. We nevertheless expect this figure to increase once projects are in full operation.

Have green bonds contributed to the decarbonization of Europe?

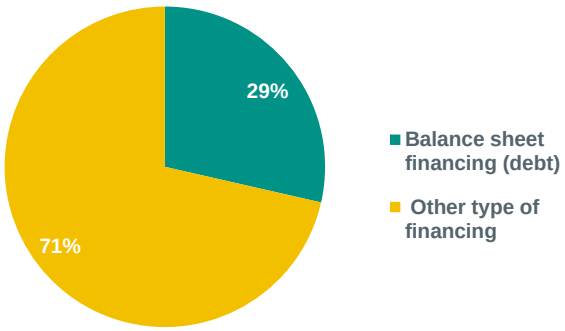
Applying similar exercise for the other sub-sectors, such as integrated, we are able to have a more complete picture on the total reported renewable energy generation financed via green bonds in Europe. We have as a next step compared the reported production to the total amount of renewable energy produced in Europe. The chart on the next page shows that renewable energy generated via projects that were financed via green bonds represent around 25% of all renewable energy production in Europe. The figure is (as expected) lower per year as some companies reported actual renewable energy generation for projects that were likely not commissioned until recently.

Green bonds have financed around 25% of all European wind and solar production…



Source: Companies green bond impact reports, ABN AMRO Group Economics. Note: Renewable energy generation considers only solar and wind. Amount financed via green bonds as of latest company's reporting.

…And this represents nearly all of the balance sheet debt investments towards renewable energy projects



Source: IRENA, ABN AMRO Group Economics. Note: latest data available is as of 2018.

As a next step, we would also like to evaluate what is the share of total renewable energy financed that is coming from companies' balance sheets. As several projects are financed via either project-financing or government grants, we have tried to estimate what share green bonds play in terms of total financing of renewable energy projects within Europe, or as well, how much green bonds account for the total renewable energy investment of utility companies. Using data from IRENA, we can see that in 2018 (latest data available) around 29% of all investment towards renewable energy was financed via companies' debt (average of the last 3 years is 26%). This figure also seems to be increasing per year.

Hence, this leads us to our conclusion that every investment from an utility company towards renewable energy projects is currently financed via green bonds. This ultimately means that more green bonds will ultimately translate into more investments towards renewable energy projects. We acknowledge, as previously stated, the fact that investments can be backward-looking (that is, was undertaken a few years ago). Nevertheless, as more investments are directed towards renewable energy projects, one could therefore expect more issuances from green bonds by utility companies. We deem therefore there to be a clear relationship between green bonds issuance by utility companies and the decarbonization of Europe.

Please note: our full piece also touches upon topics such as the influence of green bonds on the decarbonization of companies, as well as whether companies with a larger CO2 impact also secure a higher greenium on the secondary market. It includes also our key recommendations in terms of reporting for issuers and investors. Please reach out in case you have not received the full piece.

Primary market greeniums under pressure since the outbreak of the war (Corporates)

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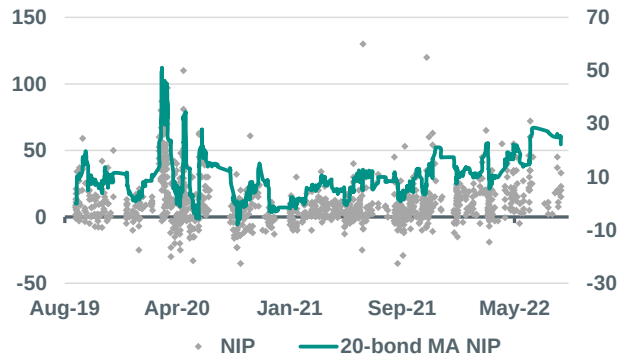
- **New issuance premiums (NIP) for corporates have been on the rise in the past few months**
- **We investigate whether the green label might have assisted issuers in securing a lower NIP**
- **Our analysis shows that while this was indeed historically the case, immediately following the outbreak of the Russia-Ukraine war, this relationship broke**
- **As the market momentum slowly restored in the months of June-August, we see however this situation being re-established**

On the corporate Investment Grade side, issuance remained very calm over the summer, with only 6 issuers coming to the market between 4th of July and 21st of August (and from these 6, only 1 in green format). There was also a notable period of 3 consecutive weeks in July where there has been no corporate issuance at all, a record if we look back 3 years. Post-summer period new issuance has once again restarted, but lagging behind previous years, with only a total of EUR 6.8bn being issued since the 22nd of August - only one, however, was done in green format (Eurogrid's 9yr EUR 750m). We are therefore taking a quick look at whether the green label might have assisted issuers in reducing issuance costs (that is, secure a lower new issuance premium, or NIP) in moments where market volatility remains relatively high, as it is at the moment. We look exclusively at green bonds, as given the larger amount of dedicated green bond funds (compared to other ESG labels, such as social), we would expect green to have also the largest influence on NIP. The time horizon of our analysis is 3 years.

Firstly, we note that we have seen a significant rise in NIPs over the last months, and more specifically following the outbreak of the Russia-Ukraine war – although these have also proven to be volatile depending on market momentum (see chart below on the left side). Nevertheless, recent issuances have shown that even more stable, well-rated companies in defensive sectors are required to pay high NIPs the get deals done.

NIPs for corporates are on the rise

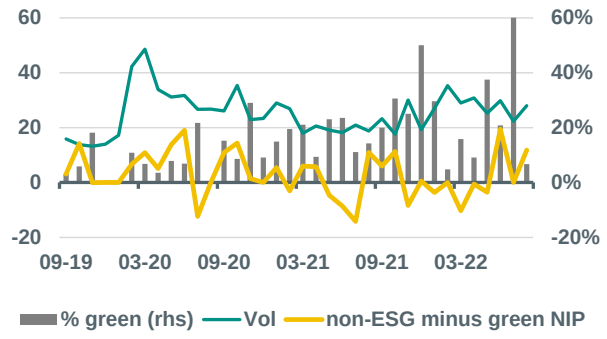
Bps



Source: ABN AMRO Group Economics. Note: MA refers to "moving average"

Green label seems to assist in volatile markets

Equity Vol, extra NIP (bps)



Source: ABN AMRO Group Economics. Note: NIP refers to monthly averages. August 2022 data until 30-8-2022.

Looking back until mid-2019, we can see that the green label seems to have assisted corporates to secure a lower NIP in moments where market volatility remains high (see chart above on the right hand side). If the yellow line on this chart is positive, it indicates that the NIP paid in green bonds was lower than the ones paid in regular (non-ESG) bonds. We see that in the majority of cases there seems to be a clear relationship between market volatility and this difference, which means that the green label clearly assisted issuers to secure lower issuance costs in moments where market volatility has been high.

However, a closer look at the graph allows us to also deduce the following: if the share of green bonds coming to the market (% of green bonds relative to total issuance within a certain month) is high, then the green label seemed to have not provided too much advantage.

We note as well that immediately following the outbreak of the Russia-Ukraine war, this relationship broke. Despite the higher market volatility and relatively low share of green issuances, we see that in the months of February to May there seems to have been almost no cost advantage of issuing in a green format. This does make sense to us, as investors seem to have become more selective on their investments, and other factors might have come into play here, such as an issuer's credit rating, industry cyclicality and the duration of the bond.

We note however that thereafter, the situation seems to have been slightly restored. Months in which there was higher market volatility and lower share of green issuance, provided green bond issuers with a lower NIP (or vice-versa). Looking specifically at August, we can see that the relatively low share of green issuance, in combination with higher market volatility, seems to have played out in favour of green bond issuers, which have managed to secure a lower NIP vis-à-vis regular issuers. As we slowly move towards more bearish market sentiment, however, it is likely that once again other variables, such as credit rating, industry cyclicality and the duration of the bond, will once again become dominant over the green label.

Primary market greeniums under pressure since the outbreak of the war (Financials)

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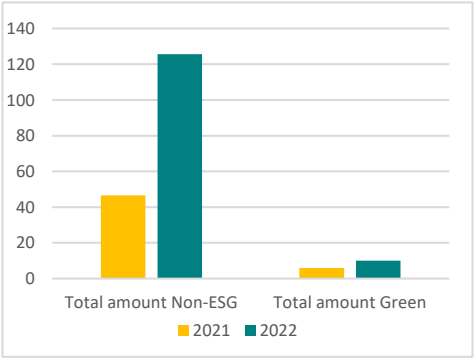
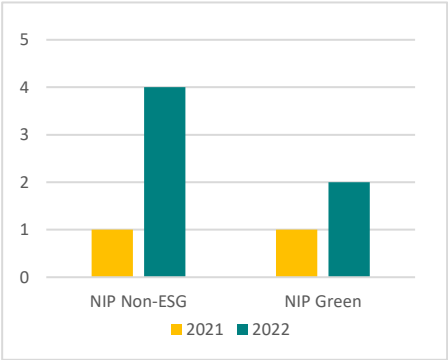
- **New issuance premiums (NIP) for financial institutions have risen for all ranks of debt since the beginning of the year**
- **We investigate whether the green label might have assisted issuers in securing a lower NIP**
- **Our analysis shows that for riskier ranks of debt, in the face of unprecedent levels of volatility, the greenium seems to have vanished**

There is a lot of evidence from different research that an ESG label brings advantages to issuers when pricing a new ESG labelled-bond when compared to bonds with no ESG label (the so-called greenium). Furthermore, one would perhaps expect that this is especially true in turbulent times, given that ESG investors are commited to the asset class. We assess whether this is true, or whether it is the case that investors prioritize different features in unpredictable times, by comparing the first 8 months of 2021 and 2022. While the former was indeed a stable and predictable period, with investors taking, on average, risk-on positions for most of the year, the same cannot be said about 2022. This year was characterized by several investor mood swings due to monetary policy reversal in most developed economies, and record inflation levels. We cover the four different ranks of debt, ranging from covered bonds to senior-preferred (SP), senior non-preferred (SNP) and Tier 2 bonds.

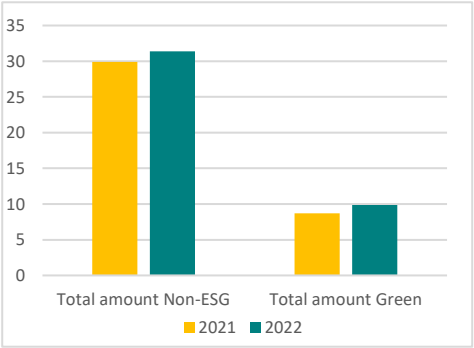
So far in 2022, a total of 51 green bonds, across all ranks of euro bank debt, were issued, bringing supply to a total of EUR 35.9bn. Similar numbers were registered for the same period in 2021, when a total of 50 green bonds were issued, with a total volume of supply of EUR 31.35bn. Surprisingly, demand for green bonds in 2022 actually surpassed demand in 2021 (EUR 82.9bn vs EUR 77.3bn). Nonetheless, issuers had to pay, on average, larger new issue premiums in 2022 than they did in 2021. Our analysis indicates that, on average, in 2022, issuers paid 12bp for bringing a new green deal to the market. While in 2021, the new issue premium paid was, on average, 1bp. Nevertheless, the question remains whether green deals performed better in comparison to non-ESG deals. Below we present the figures concerning the four different ranks of debt, where we compare total amount issued, bid-to-cover ratio and new issue premiums.

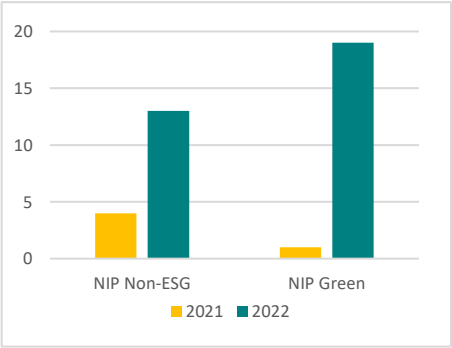
Covered bonds



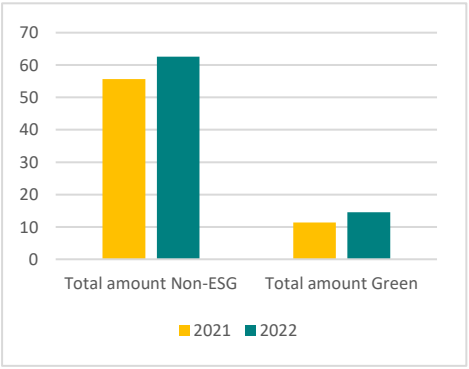


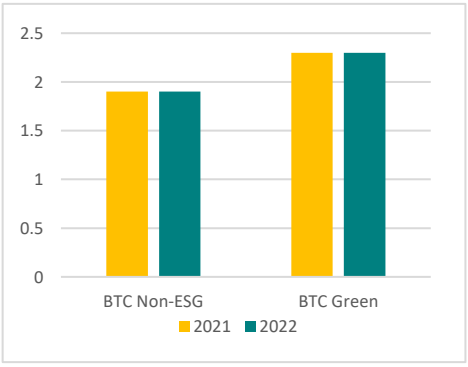
Senior Preferred

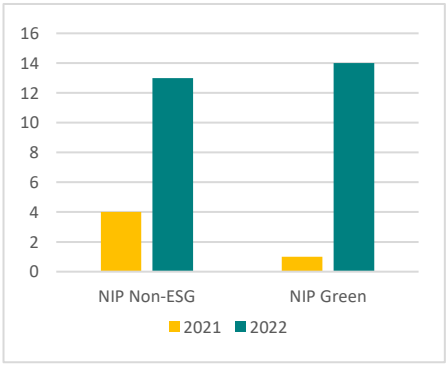




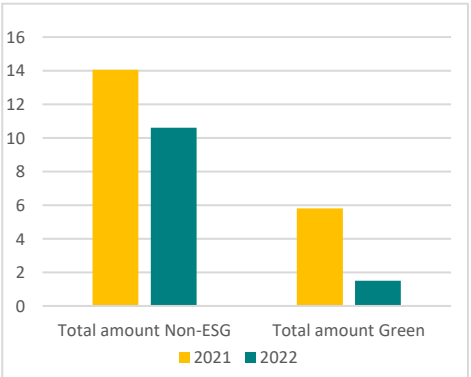
Senior non-preferred

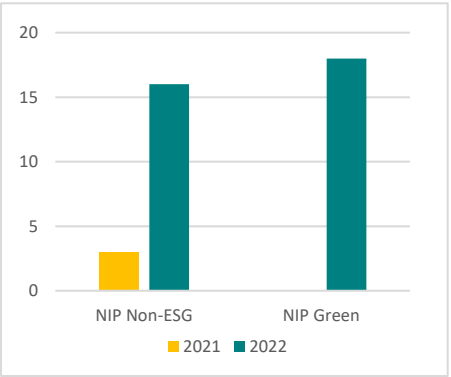






Tier 2

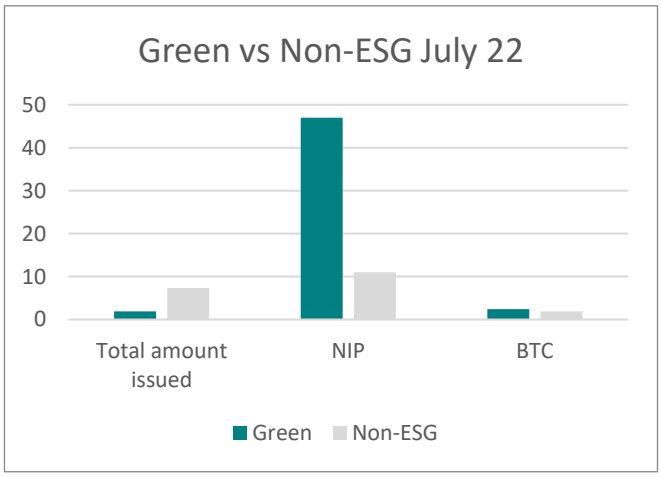


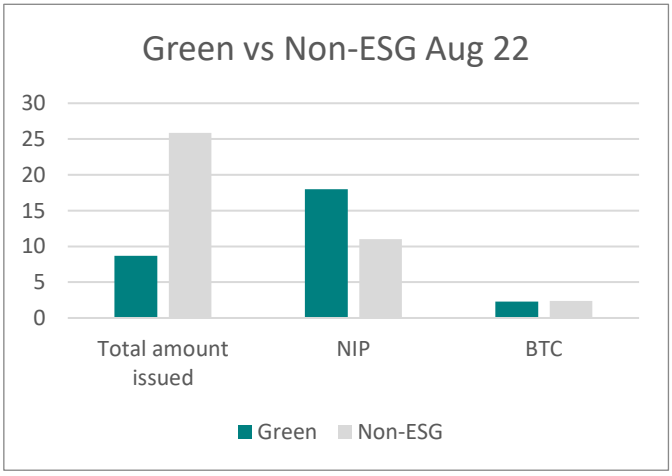


The graphs above show that demand as reflected by bid-to-cover ratios (BTC), remained quite stable in both senior preferred and senior non-preferred markets, just increasing for covered green bonds, and decreasing for green tier 2 bonds. Despite these sustained levels of demand, new issuance premiums (NIP) have increased across all ranks of debt regardless of the ESG label. This makes sense given this year's risk-off positioning of investors.

Nonetheless, what is surprising is this year's reversal between green bonds and non-ESG bonds. Except for covered bonds, issuers had, on average, to pay a higher new issue premium for green bonds when compared to non-ESG issuers. For instance, in the senior preferred debt market, in 2021, new issue premium for green issuers was on average 1bp while for non-ESG issuers it was 4bp. But in 2022, the NIP for green issuers equalled 19bp, while for non-ESG issuers that number is 13bp. A similar picture, albeit to a lesser extent, arises for senior nonpreferred paper as well as Tier 2 debt. This suggest that in times of stress, the green label may lose its relevance, not bringing a pricing advantage to issuers. A reason may be that investors now weigh the various features differently, outweighing for instance a bonds' tenor, the issuer itself, or the credit rating.

Finally, we have analysed whether our conclusions also hold for the summer period, following the same analysis as for corporate bonds (see above). It may be difficult to draw any meaningful conclusions, given the low issuance in these past two months. In July, for instance, only 12 deals were closed, from which three were green labelled (20% of all the deals). In August, issuance jump started again, with 42 new bonds coming to the market. But, again, only 25% of these (11 out of 42 deals) were green. And, our estimates for these two months confirmed once again that the green label doesn't seem to bring a pricing advantage in troubled times. The numbers registered still indicate that the NIP paid for green bonds is, on average, higher than the NIP paid for non-ESG bonds – as shown in the graphs below.





Overall, we think it is too early to draw any firm conclusions, as the dataset as well as period is limited. Still, it seems for now fair to assume that the advantage of green bonds in the primary market is less strong, or even absent, during times of ongoing turbulence.

Sustainable steel provides competitive advantage in the long run

Casper Burgering – Economic Transition Economist | casper.burgering@nl.abnamro.com

- **The transition towards a less polluting way of producing steel is gaining traction**
- **High electricity prices are currently hurting many European steel producers in particular, and this is harming their competitiveness**
- **In the long run, a more sustainable production process will be decisive for business continuity and will ultimately shape competitiveness**

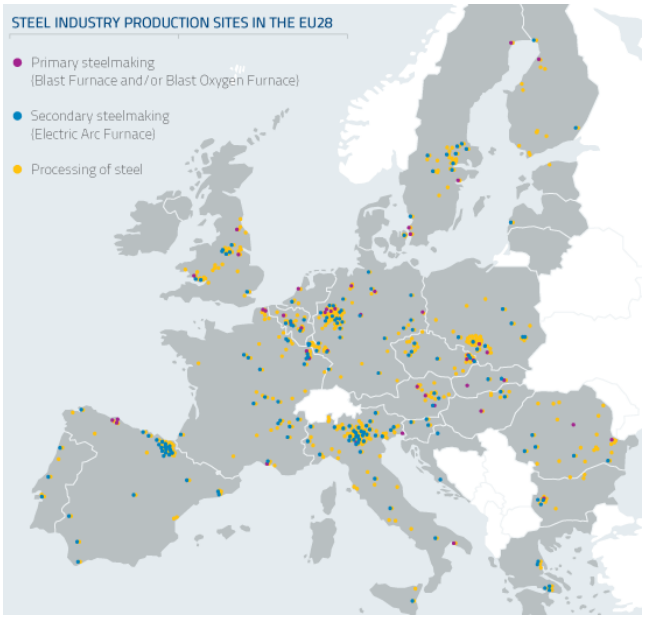
The steel industry is one of the world's most energy-intensive sectors, accounting for about 8% of global CO2 emissions. This ensures that the sector is often in the spotlight. For steel producers, making processes more sustainable and reducing emissions is crucial. The sooner steel producers take concrete steps to improve sustainability, the sooner this can result in a competitive advantage.

Technical complex processes

Roughly speaking, there are two routes to produce steel. The integrated route is based on the production of iron from iron ore. This is the primary route of steel production, via the so-called 'Blast Oxygen Furnace' (BOF). There is also the recycling route, where scrap metal is used as the main ferrous raw material. This is called the secondary route of steel production, which runs via the Electric Arc Furnace (EAF). The energy consumed via the BOF-route is mainly fossil fuel (mainly coking coal) and for the EAF-route it is mainly electricity. However, the recycling route consumes on balance much less energy (about 80%) than the integrated route.

Production locations Europe

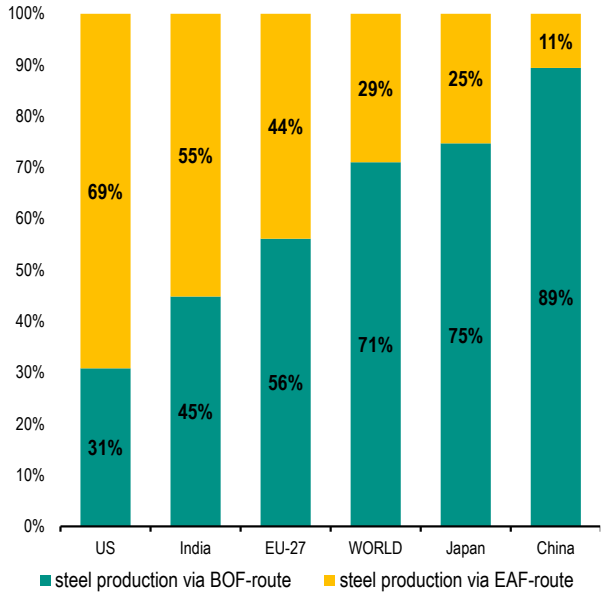
locations by production process



Source: Eurofer

Production process steel industry

share production process (in %) in five largest steel producing regions



Source: World Steel Association, ABN AMRO Group Economics

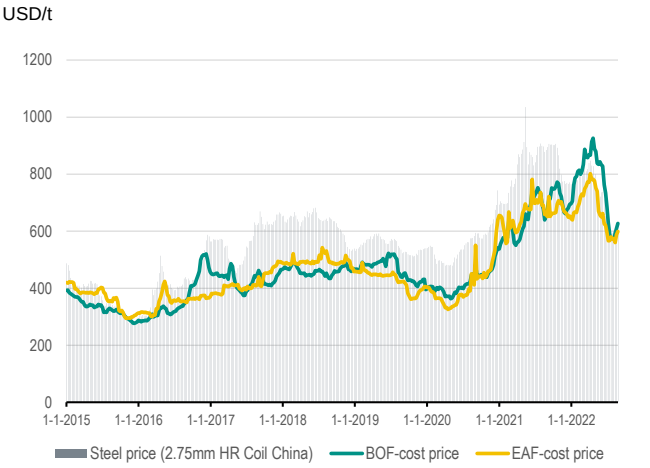
In the United States (US), approximately 31% of total steel production goes through the BOF-route, while the majority goes through the EAF-route. In China, the reverse is true. There, the bulk of steel is produced via the BOF-route, while only 11% goes via the - less polluting – EAF-route. This is because China is originally rich in raw materials such as coking coal and iron ore, so the choice for BOF-route was the economically sensible option. In the US, producers were largely dependent on foreign countries for the supply of raw materials. In order to limit this dependency, the EAF-route was chosen. This choice originates from both an economic and strategic point of view. In Europe, the ratio is unbalanced at 6 percentage points, which, incidentally, is roughly what it has been for the past ten years.

In any case, it is clear that the movement towards a less polluting way of producing steel - via the EAF-route - is gaining traction all over the world. However, the sector is facing a long investment cycle due to the large capital-intensive installations. This makes the transition to a more sustainable way of producing relatively slow compared to the less capital-intensive sectors.

Cost prices

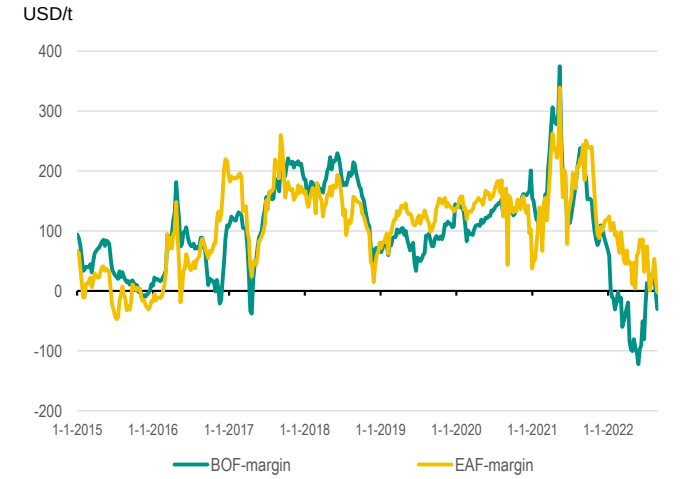
The cost structure of the BOF-route and the EAF-route differ. While the BOF-route has raw materials (such as coking coal, iron ore and partly scrap) as the main cost item, the EAF-route has the scrap cost and the electricity cost as the dominant cost items. In addition, the BOF-route not only faces higher costs for greenhouse gas emissions compared to the EAF-route, but also the transportation costs of the many types of raw materials are significantly higher in the BOF-route. But despite these differences in the cost structure, the cost prices of both routes of steel production have been running almost parallel since 2015. On balance, the EAF-route shows a slightly more positive trend than the BOF-route, but the differences remain generally small. The figures below show the trends of a global average situation. However, per region the levels of prices for steel and the raw materials (such as raw materials and energy) differ significantly.

Cost price BOF- and EAF-route versus steel price



Source: Refinitiv, Steel-on-the-net, ABN AMRO Group Economics

Margins BOF- and EAF-route



Source: Refinitiv, Steel-on-the-net, ABN AMRO Group Economics

Volatility in commodity prices mainly determines the trends in margins over time. For instance, the negative margins in the case of the BOF-route early 2022 were mainly caused by the sharply rising prices for coking coal. From June 2022 onwards, these prices then fell sharply again, causing the margins to recover. And the peak in margins in early 2021 was caused by a stronger increase in the price of steel, while the prices for raw materials did not increase as much in this period. The high electricity prices are currently hurting European steel producers with EAF production processes in particular, and this is hurting their competitiveness. Electricity prices in the US, Japan, China and India are significantly lower than in Europe for the business sector.

Competitive advantage

Gaining a competitive edge on price with sustainable steel - through the EAF-route - is currently a difficult story for European steel producers. It is the high electricity prices that make steel via the EAF route relatively expensive. The advantage of lower CO2 emission costs cannot compensate for the increase in energy costs. But in the long run, competitive advantage can – for example – also be achieved at product level, such as with carbon-free steel products.

Steel is also partly a sustainable material. It is one of the most recycled materials in the world and can be reused practically forever. However, the production process - especially via the BOF-route - is heavily polluting. In the past, the wide availability of the raw materials (coking coal and iron ore) ensured that the BOF-route was the preferred choice. With the need for more sustainability, the demand for greener steel - via the EAF-route, for example - is gaining traction. A higher CO2 price will also help convince steel producers more quickly to switch to lower CO2 technologies to avoid CO2 costs,

despite the high capital costs needed for these technologies. A rising CO2 price in the long run will increasingly benefit producers who use low-carbon technologies more intensively (such as EAF). The CO2 price has risen since the end of 2020, but the impact on profitability was marginal for a long time because the steel price was relatively high. Steel production via the BOF-route is more emission-intensive and thus erosion of the margins will take place as soon as the CO2 price rises further. And the greener and lower-carbon steel producers will be able to sell their excess allowances with increasing value until 2035. Between 2026 and 2035, the number of free emission allowances in the sector will decrease. Ultimately, these emission rights will be a thing of the past in 2036. Steel producers would then have to pay the full amount of their emissions at the then-current carbon prices. This should then lead to potentially more low-carbon investments.

But shifts in end-user and investor preferences, for example, will also gain more influence. End-users and investors will reward companies that have clear emission reduction targets, if supported by clear implementation schemes and investment plans. In this way, the company can build on more distinctive capacity and character. However, the problem is that if every steel producer in Europe were to switch to an EAF production process, the supply of scrap would fall far short.

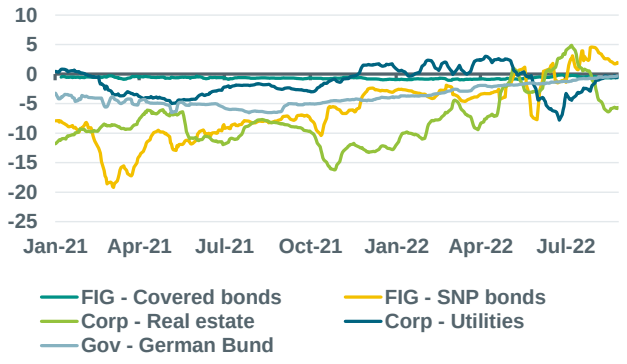
Apart from the EAF-route, other ways of producing steel are emerging. There are already numerous technologies available for reducing greenhouse gases and new techniques will became available in the medium to long term. The so-called *Direct Reduced Iron* (DRI) production process is considered a future important way of making steel with much lower emissions. This production process uses green hydrogen as a reducing agent instead of fossil fuels. However, the problem is that green hydrogen is not yet available on a large scale. Moreover, this process requires very high quality iron ore, which is relatively scarce (and therefore expensive). It could become a technique of the future in the steel sector, but there are still some obstacles to overcome. There are also many other innovative techniques to reduce emissions within the BOF and EAF pathways of steel making. New techniques and innovations - such as iron electrolysis - also have great reduction potential, but are still in the laboratory phase.

It is clear that the transition to a carbon-free or low-carbon steel production process will not be the same in all regions. Steel producers who have already invested relatively heavily in improving sustainability (such as in Europe and the US) will experience a much smoother transition to low-carbon production than those who have invested much less (such as in China and India). In any case, building and investing in a more sustainable steel production process will not only bring many environmental benefits in the long run, but also the unique steel products that end users and society are demanding today. And this proposition, in the long run, will be decisive for business continuity and will eventually recharge more and more the competitive edge.

ESG in figures

ABN AMRO Secondary Greenium Indicator

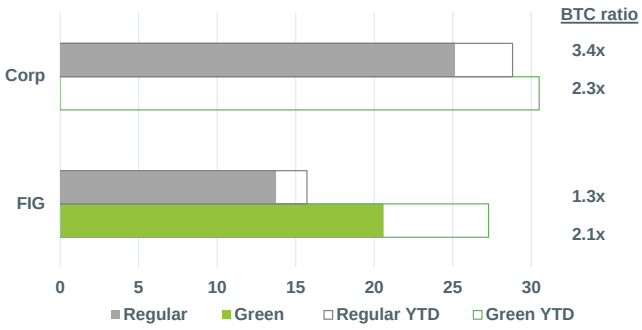
Delta (green I-spread – regular I-spread)



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

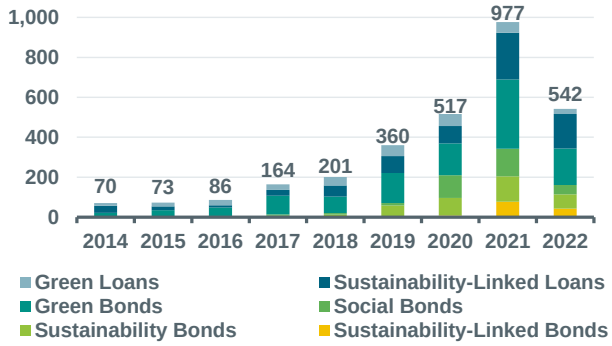
NIP in bps



Note: Data until 01-09-22. BTC = Bid-to-cover orderbook ratio. Source: Bloomberg, ABN AMRO Group Economics.

Sustainable debt market overview

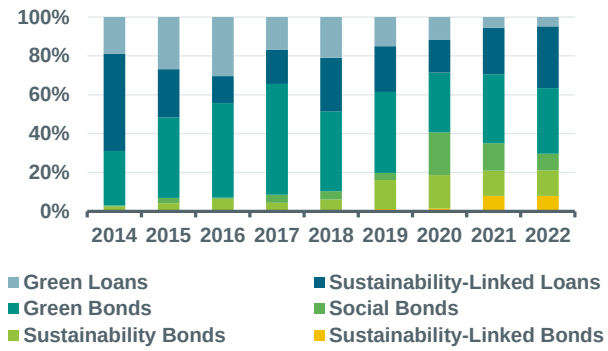
EUR bn



Source: Bloomberg, ABN AMRO Group Economics

Breakdown of sustainable debt by type

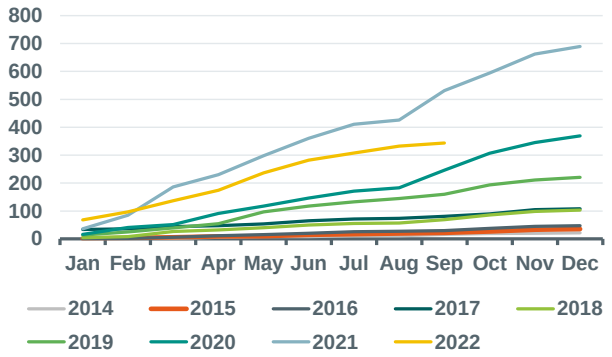
% of total



Source: Bloomberg, ABN AMRO Group Economics

YTD ESG bond issuance

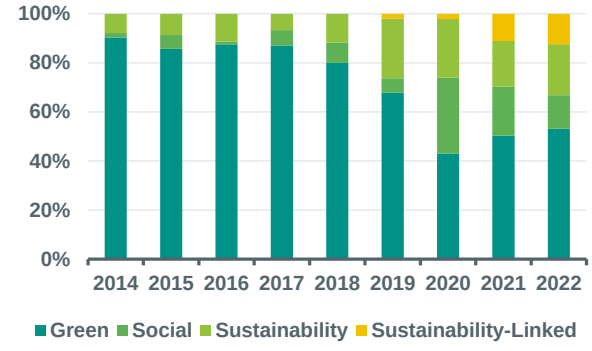
EUR bn



Source: Bloomberg, ABN AMRO Group Economics

Breakdown of ESG bond issuance by type

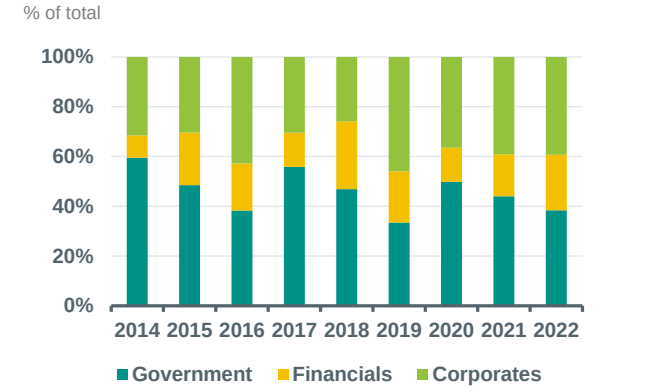
% of total



Source: Bloomberg, ABN AMRO Group Economics

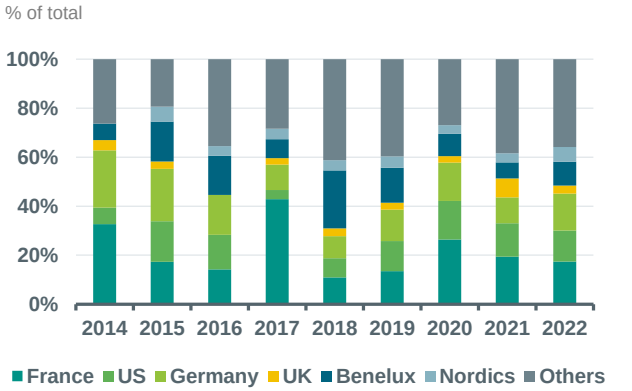
Figures hereby presented take into account only issuances larger than EUR 250m and in the following currencies: EUR, USD and GBP.

Breakdown of ESG bond issuance by sector



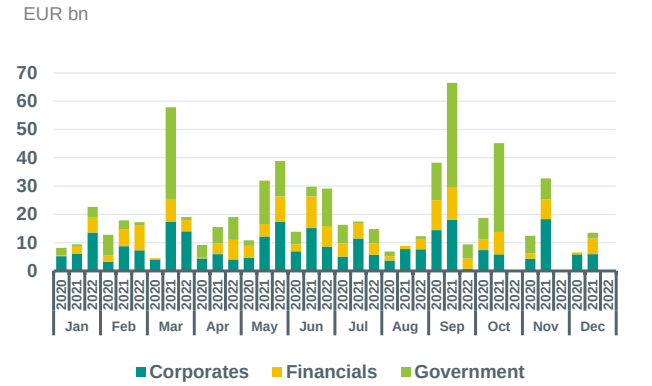
Source: Bloomberg, ABN AMRO Group Economics

Breakdown of ESG bond issuance by country



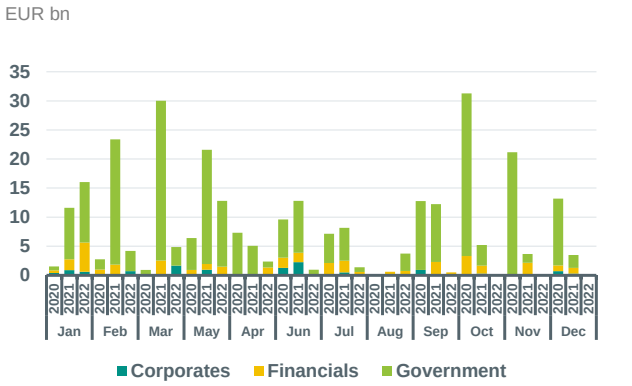
Source: Bloomberg, ABN AMRO Group Economics

Monthly Green Bonds issuance by sector



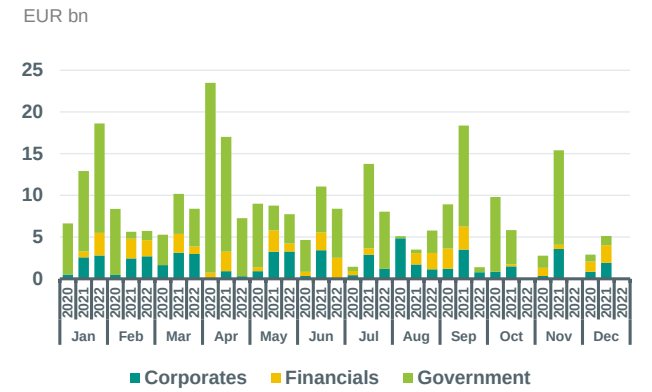
Source: Bloomberg, ABN AMRO Group Economics

Monthly Social Bonds issuance by sector



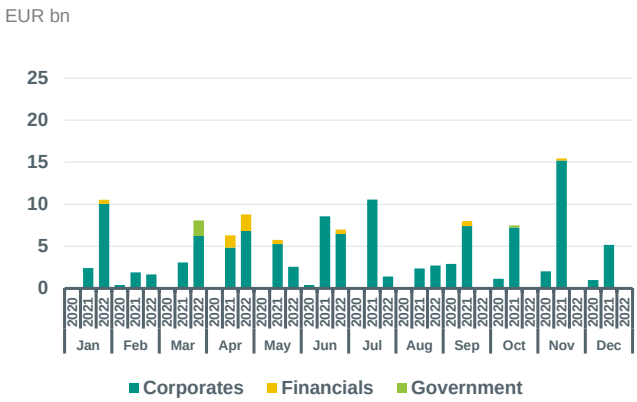
Source: Bloomberg, ABN AMRO Group Economics

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

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

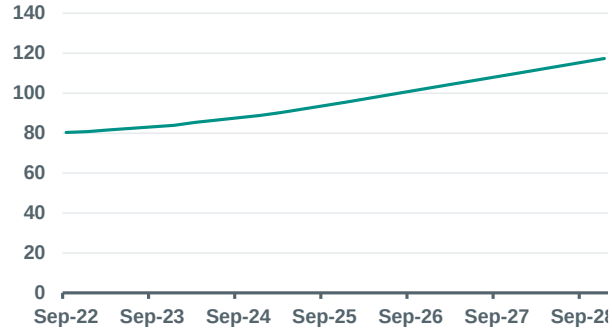
Carbon contract current prices (EU Allowance)

EUR/MT

Source: Bloomberg, ABN AMRO Group Economics

Carbon contract future prices (EU Allowance)

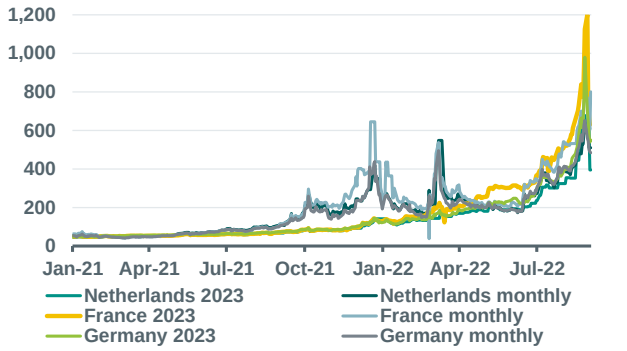
EUR/MT



Source: Bloomberg, ABN AMRO Group Economics

Electricity power prices (monthly & cal+1 contracts)

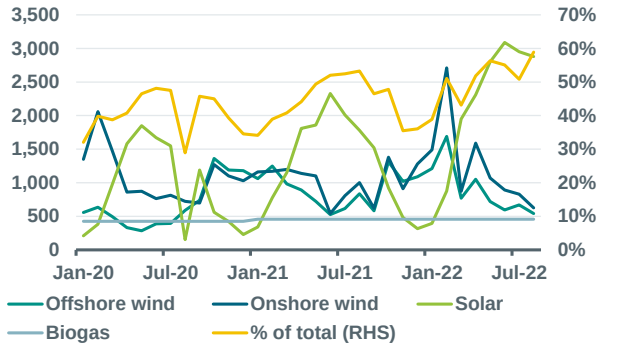
EUR/MWh



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

Electricity generation from renewable sources (NL)

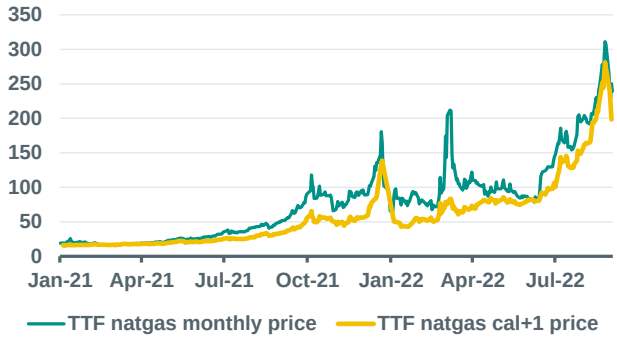
GW % of total



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

TTF Natgas prices

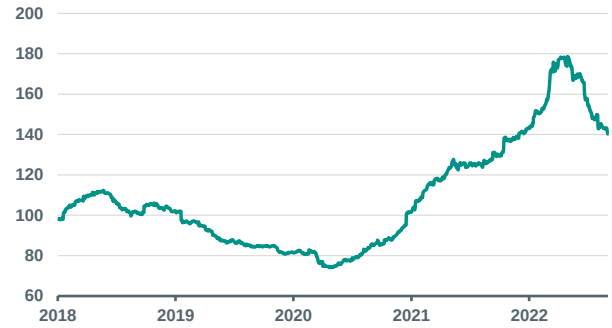
EUR/MWh



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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