Green Market Sentiment Indices
European Union

Semester 2 2021

Climate-KIC

Co-funded by the European Union

Supported by:

Federal Ministry for the Environment, Nature Conservation and Nuclear Safety

based on a decision of the German Bundestag

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About 1in1000

1in1000 is a new research program by 2° Investing Initiative that brings together new & existing research projects on long-termism, climate change, and adjacent future risks for financial markets, the economy, and society. Its objective is to develop evidence, design tools, and build capacity to help financial institutions and supervisors to mitigate and adapt to future risks and challenges. The programme focuses on climate change (inter-) connected risks and challenges, notably risks stemming from ecosystem services and biodiversity loss, as well as risks from social cohesion and resilience. To achieve this objective, 1in1000 operates with three main areas: i) Long-term metrics; (ii) Risk (management) tools and frameworks; and (iii) Policies & incentives.

About 2 Degrees Investing Initiative

The 2° Investing Initiative (2DII) is an international, non-profit think tank working to align financial markets and regulations with the Paris Agreement goals. Working globally with offices in Paris, New York, Berlin, and London, we coordinate the world's largest research projects on climate metrics in financial markets. In order to ensure our independence and the intellectual integrity of our work, we have a multi-stakeholder governance and funding structure, with representatives from a diverse array of financial institutions, regulators, policymakers, universities, and NGOs.

About the funders

This project is part of the International Climate Initiative (IKI). The Federal Ministry for the Environment, Nature Conservation and Nuclear Safety (BMU) supports this initiative on the basis of a decision adopted by the German Bundestag. This report reflects the authors' views only, and the funders are not responsible for any use that may be made of the information it contains. This report also received funding from EIT Climate-KIC.

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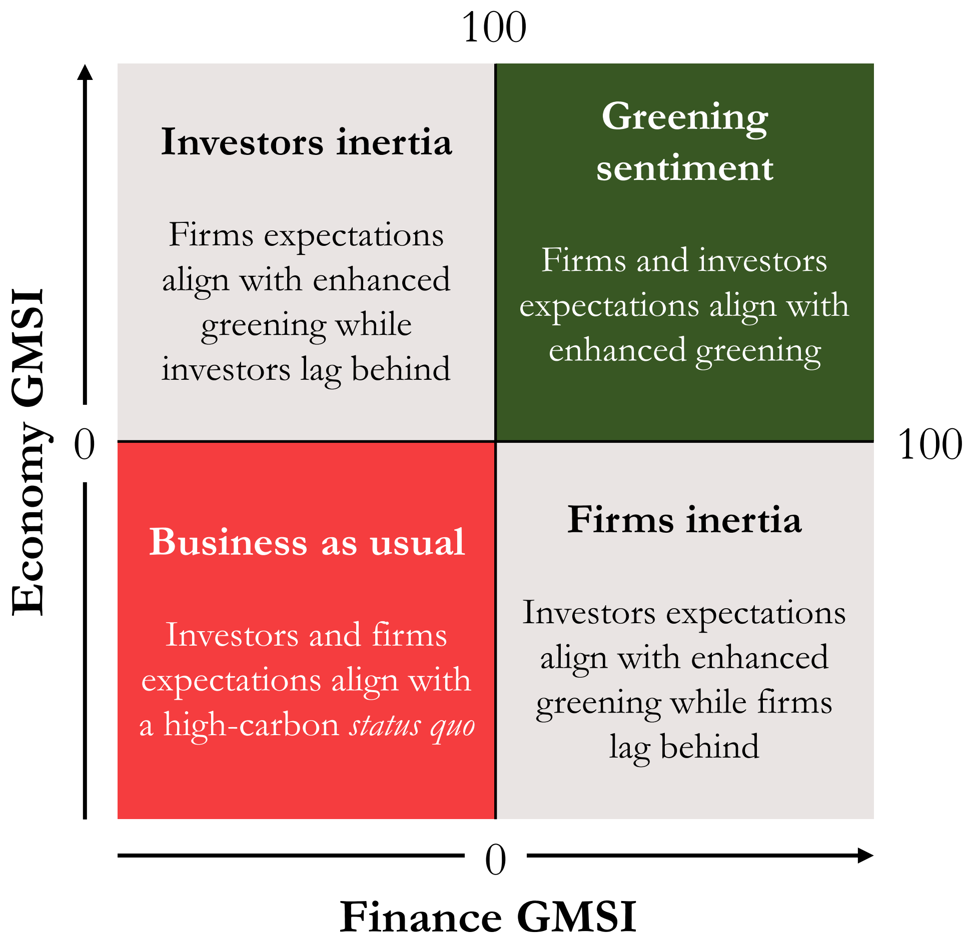
Summary

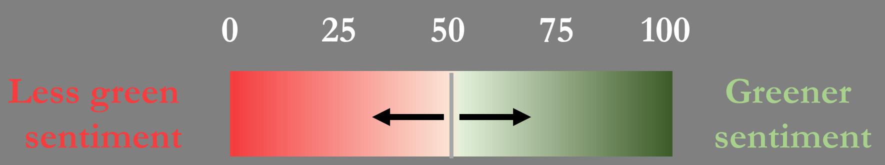
EU firms and investors anticipate a slightly green recovery of the EU economy from the Covid crisis

1in1000 developed a framework of **Green Market Sentiment Indices (GMSIs)** assessing firms (**Economy GMSI**) and investor' sentiments (**Finance GMSI**) related to the **green recovery** of the **auto, power and oil & gas** sectors. This report outlines the application of this index to the European Union.

	Economy GMSI	Finance GMSI	
Automotive	67	50	Greening sentiment
Power	52	54	Greening sentiment
Oil & gas	54	65	Greening sentiment



How to read the GMSIs?



1. The Green Market Sentiment Indices

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The forward-looking Green Market Sentiments Indices (GMSIs) capture sentiments related to the green recovery from the Covid crisis

The Green Market Sentiment Indices (GMSIs) developed by the 1in1000 research programme of 2 Degrees Investing Initiative assesses the sentiments related to the recovery from the Covid crisis.

The indices:

- look at the **real economy** and **financial markets**. These two spheres are examined both separately and in relation to each other.
- focus on the **automotive, power, and oil & gas sectors,** responsible for more than 85% of CO_2 emissions*.
- are geared towards the future rather than the past. To do so, they capture the sentiments of investors and firms around the transition to a green and low-carbon economy.

Through looking at the **evolution of market sentiment,** at both real and financial levels, the indices:

- **assesses how firms** in the three sectors considered plan to develop low-carbon production and reduce high-carbon production **at the economy level,**
- **assesses how investors** anticipate the future of the three sectors considered in terms of profits and risks derived from high-carbon and low-carbon production **at the financial level.**

We first applied the GMSIs to the European Union (EU), without the UK, because it has among the largest and greenest recovery plans in the world[1] along with one of the most ambitious greenhouse gas emissions reduction target for year 2030. We compare the evolution of our indicators, presented on the next slide, through 2020 and 2021.

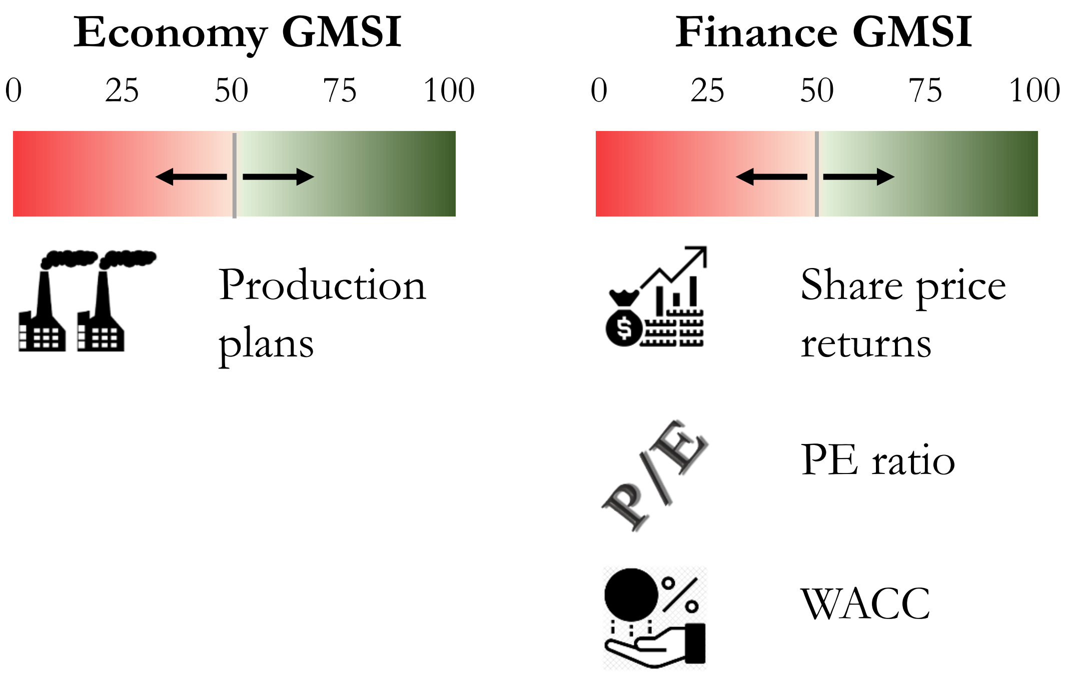
Along with this slide deck, we present the results of this project in an online dashboard on the 1 in 1,000 website. It will be biannually updated to keep track of the green recovery of the EU and other regions of the world, starting with Latin America in April 2022.

*Including indirect emissions. Data is extracted from the International Energy Agency data and is as of 2019.

The GMSIs capture economy and finance sentiments and are inspired by the Purchasing Managers Indices

The GMSIs, inspired by Purchasing Manager's Indices (PMIs), provide an aggregated measure of the forward-looking market's perception of the development of the green recovery. PMIs are aggregated measures of purchases managers' perception of the market trend for the near future, capturing its periodic, usually month-to-month contraction (PMI < 50) or expansion (PMI > 50).

Our indicators are aggregated into two GMSIs, one for the economy, the other for finance. Each of them takes a value between 0 and 100, above 50 reflects strengthened anticipations of the greening of the economy, while a value below 50 reflects a sentiment leaning towards a higher-carbon near future. These GMSIs capture the greening of a sector over a time period, but should *not* be interpreted as a measure of how green a sector is.

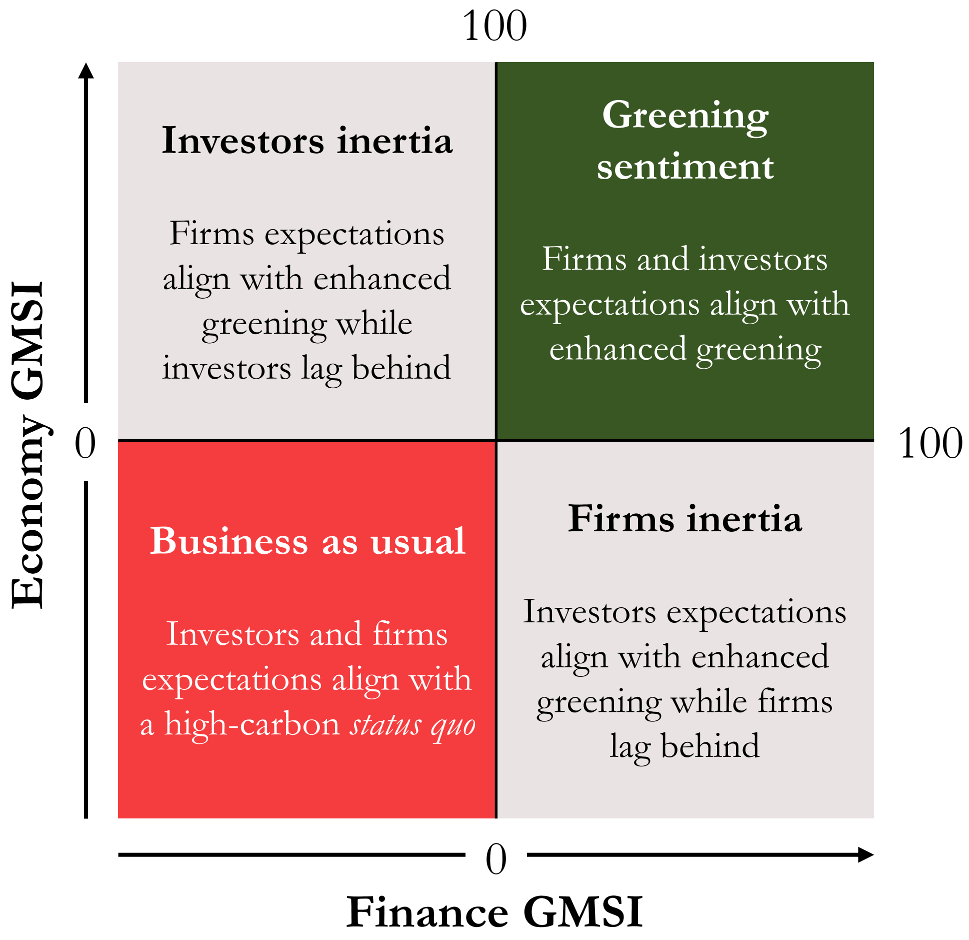


We provide more details on the way the two GMSIs are built in the technical supplement to this slide deck.

The framework will monitor the convergence (or divergence) of real and financial markets' sentiments with regards to the green recovery

The framework focuses on assessing the connection of sentiments of real and financial markets, which are classified into four categories:

- **Greening sentiment:** investors' and firms' sentiments converge, allowing financial and real markets participants' actions to support each other towards decarbonisation.
- **Investors inertia:** firms' sentiment points towards an acceleration of their transition, while investors show more inertia in transitioning capital towards low-carbon production and away from high-carbon.
- **Firms inertia:** investors' sentiment points towards a clean energy transition while firms are slower to build low-carbon production and phase out high-carbon production, potentially giving rise to a green bubble
- **Business as usual:** both investors' and firms' sentiments converge towards a high-carbon *status quo*, potentially giving rise to transition risks across financial markets and the real economy.



The Economy GMSI builds on one indicator and the Finance GMSI on three indicators

The indicators below capture the evolution of market sentiment. Their movement, between two timestamps, allows us to assess whether market sentiment leans towards a less or more high-carbon future. For financial indicators, we classify companies as **leaders** (low-carbon best performers) and **laggards** (worst performers), and compare the evolution of the indicators for these two categories.

Economy GMSI

Indicator 1 – Production plans

Production plans of high-carbon and low-carbon products indicate how firms anticipate future demand.

Finance GMSI*

Indicator 2 – (Nominal) Share price returns

Share prices are, in theory, equal to expected discounted cash flows. Positive returns therefore indicate an expected strengthening performance of the underlying firm**.

Indicator 3 – Price-Earnings (PE) ratio

The PE ratio is the market price of a share divided by earnings per share. It captures dividends and/or price growth anticipations of investors.

Indicator 4 – Weighted Average Cost of Capital (WACC)

The WACC is the weighted average return asked by debt and equity investors for investing in a company. It indicates the risk, as estimated by investors, that the returns fail to materialise and the short-sightedness of investors (a higher WACC means higher discounting of long-term cash flows).

*The three financial indicators are usually relatively correlated. Their aggregation however allows to capture more information than relying only on one of them.
**Share prices are also affected by speculative behaviours. In such situations, positive returns would reflect investors' anticipations of a further price increase.

2. The Green Market Sentiment Indices applied to the European Union

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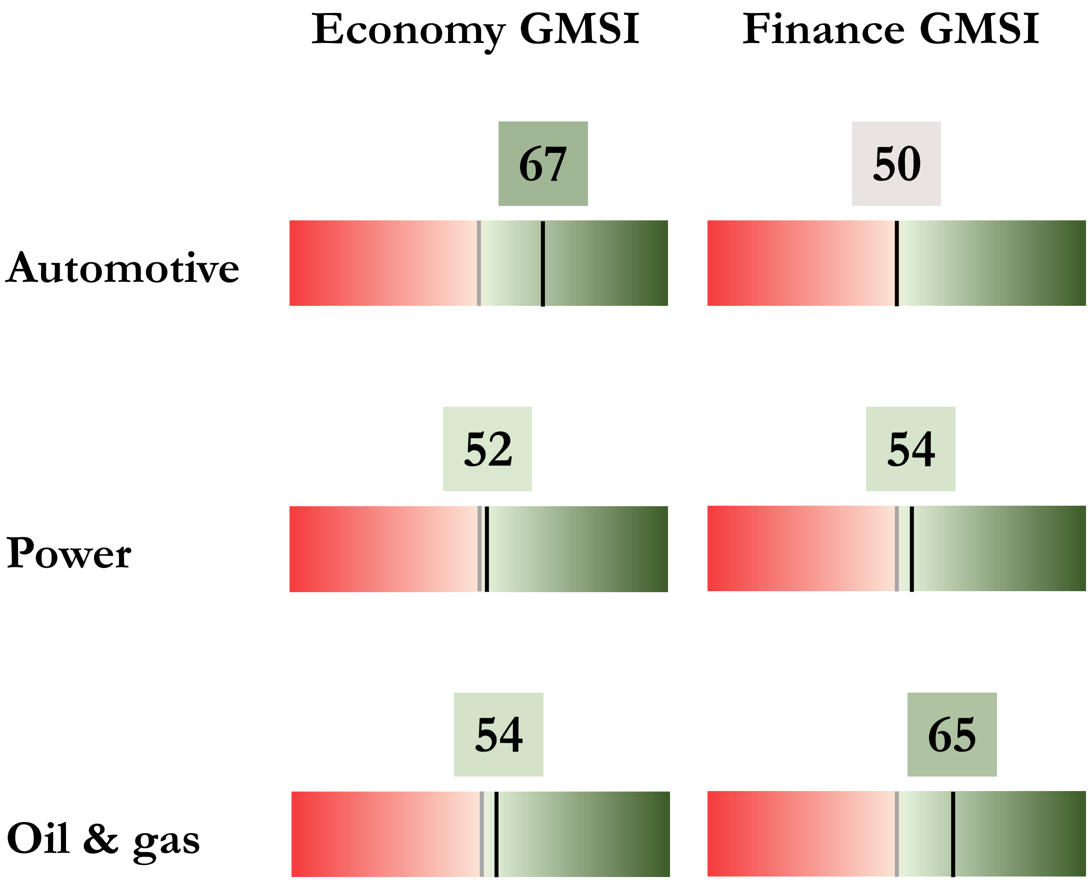
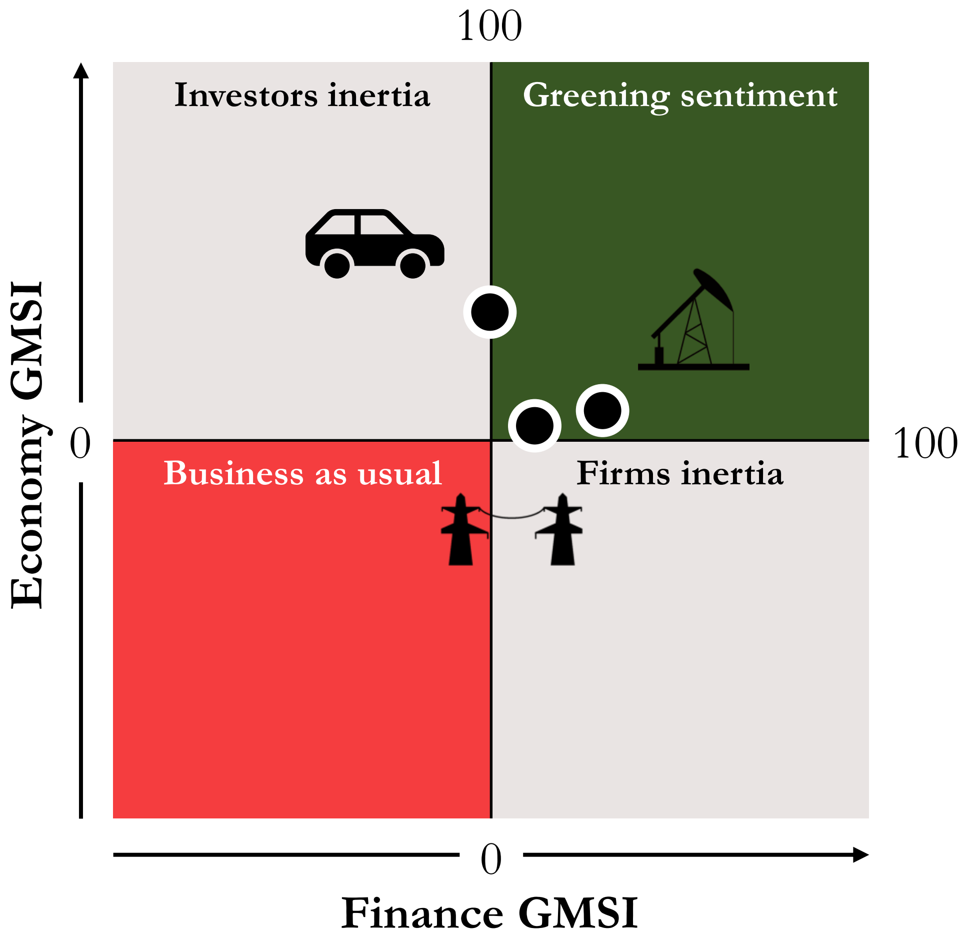
EU firms and investors anticipate a slightly green recovery of the EU economy from the Covid crisis



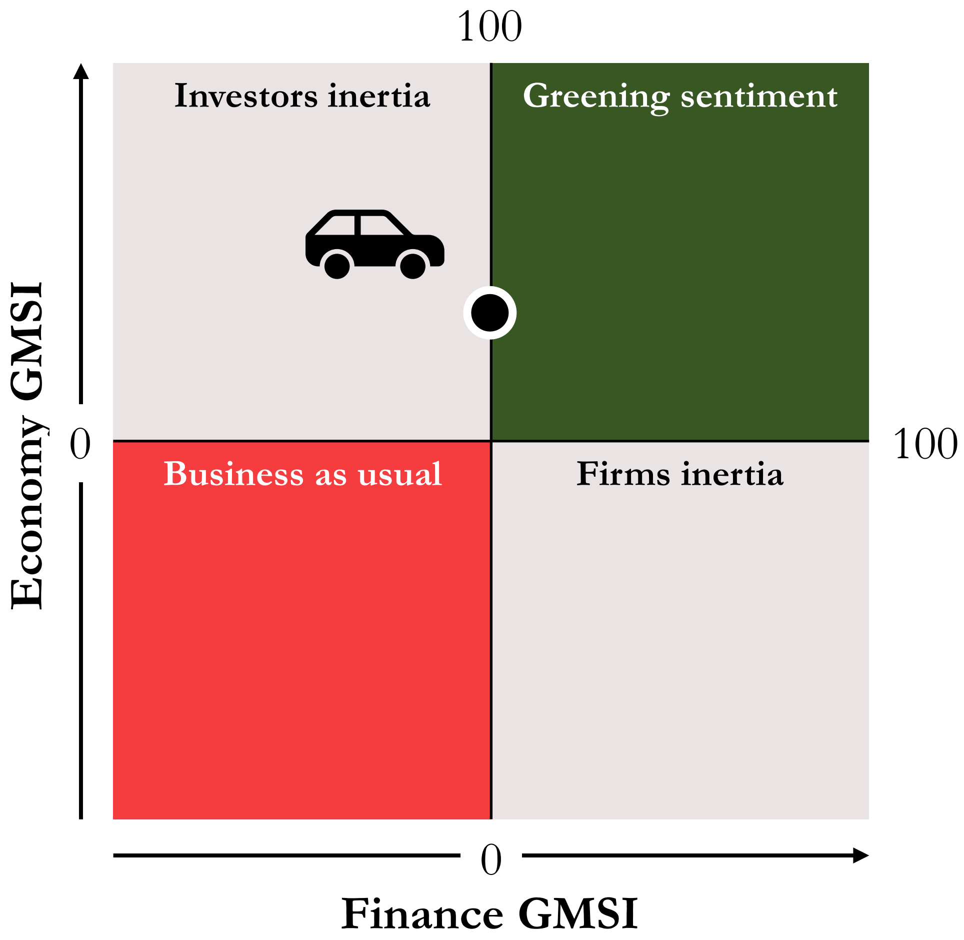


Automotive sector

A slight greening sentiment characterises the recovery of the EU auto sector, although the indicator is at the border of investors inertia

At the real economy level, automakers show strongly greening sentiment over 2020 and 2021. Their plans of production lean more towards the low-carbon transition in 2021 than they did before the crisis. **Financial markets only slightly accompany this movement at the real economy level.** Over 2020 and 2021, anticipated performance of the leader increased more than for the laggard. However, over the same time period, the perceived riskiness of the leader increased more than for the laggard. Moreover, a relatively equivalent reduction in PE ratios reveals little difference in anticipated dividends/price growth evolution.

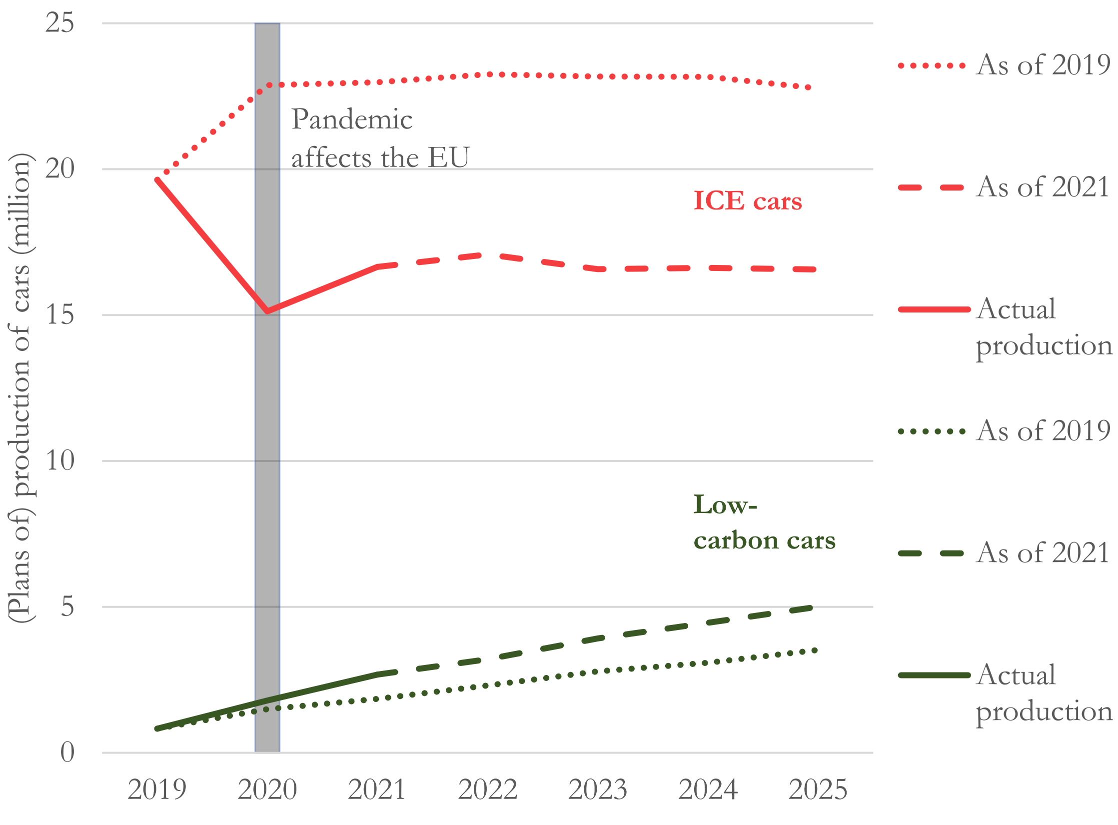
We characterise the situation as a slight greening sentiment. Firms and investors sentiments lean towards the greening of the sector, but investors seem less confident than firms. The greening of anticipations is limited by relatively positive investors' anticipations of performance and growth of the laggard and by a stronger risk perception of the leader than the laggard.



Compared to before the crisis, EU automakers anticipate an acceleration of the greening of the auto market

Economy GMSI 67

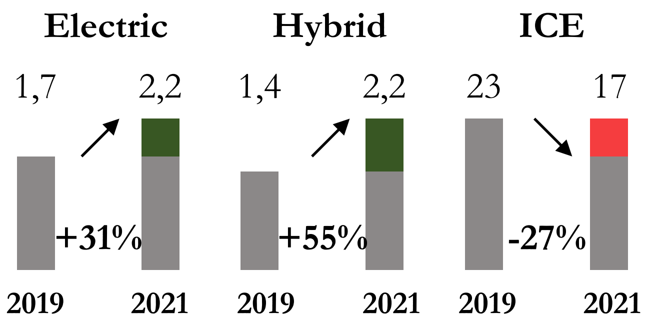
Figure 1: Plans of production of ICE and low-carbon cars by EU automakers



Over 2020 and 2021, plans of production for Internal Combustion Engine cars decreased significantly, while low-carbon cars production plans strongly increased.

The firms' greening anticipations align with a very supportive policy context in the EU:

- The European Commission set fleet CO_2 target for 2020-2024, which is a strong driver of the greening of the sector.[2]
- Recovery policies contained schemes (subsidies, public investments) aimed at boosting low-carbon cars demand in the EU.[3]



Planned production of cars for 2024, as of 2019 and 2021, in million.

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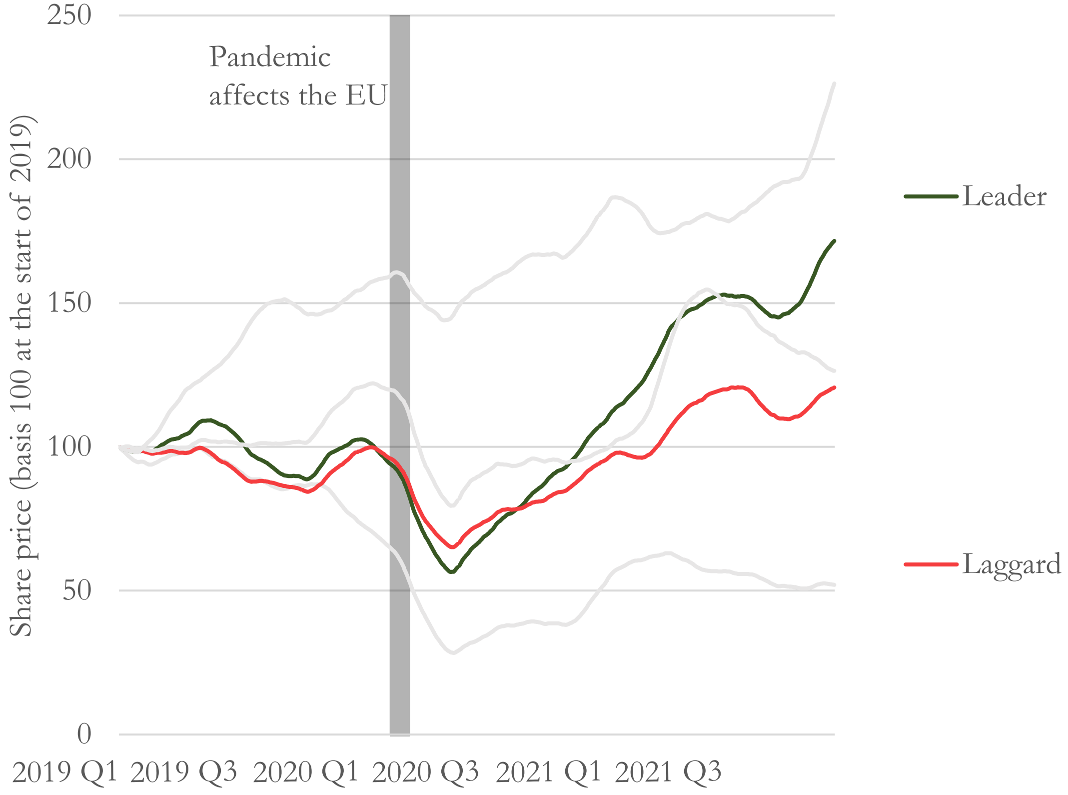
Compared to before the Covid crisis, financial markets expect stronger performance of both the laggard and leader

Finance GMSI 50

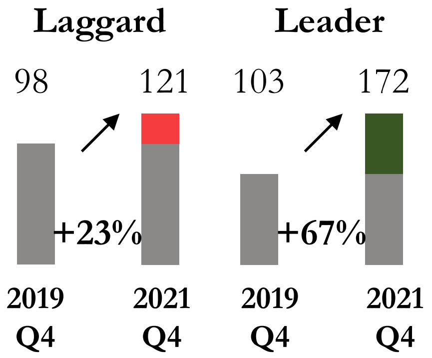
Figure 2: Share price returns of EU automakers (50 days moving average)



Lines show underlying companies' share prices (the green line shows the leader, the red one the laggard, the grey the other companies in our sample), brought to a basis of 100 at the start of 2019.

The company leading the low-carbon transition of the auto sector (*leader*) shows more positive share price returns than the company lagging behind it (*laggard*) over 2020 and 2021. Increasing returns show increasing performance expectations by financial markets.

After showing negative returns when the pandemic hit the EU, most automakers returned to positive share price returns. The leader's share price gained 67% throughout 2020 and 2021, and the laggard's share price also increased by 23%. The increase in share price returns indicates that both firms – especially the leader - are expected to perform better than pre-crisis.

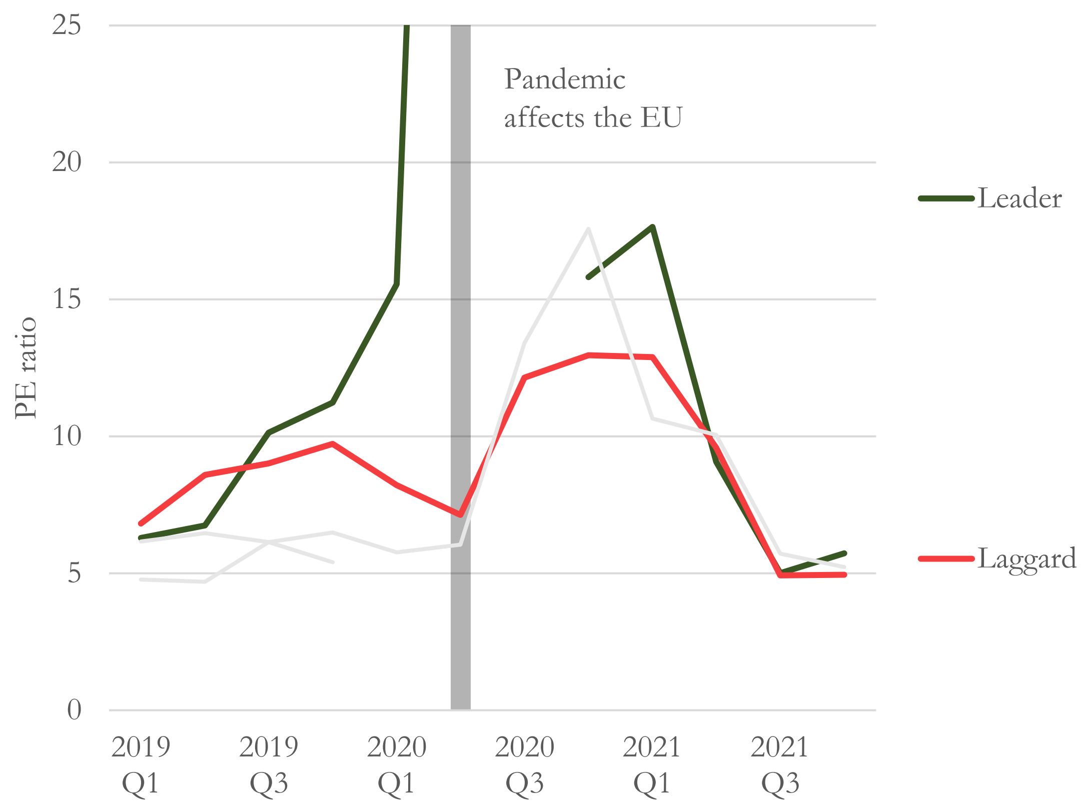


Share price returns per category, from 2019 Q4 (left bar) to 2021 Q4 (right bar). Share prices = 100 at the start of 2019.

Compared to before the Covid crisis, investors expect less dividends or price growth from both the laggard and leader

Finance GMSI 50

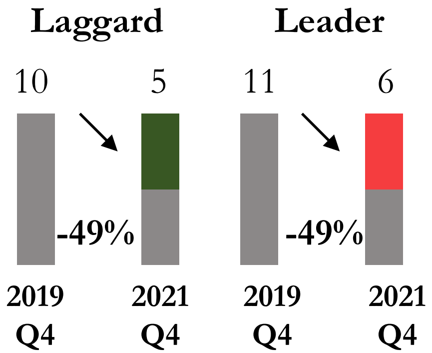
Figure 3: PE ratio of EU automakers (3-month average)



Lines show underlying companies' PE ratio (the green line shows the leader, the red one the laggard, the grey the other companies in our sample). Absence of observation means the ratio is negative, and therefore not applicable.

Price-Earnings (PE) ratios of the laggard and leader decreased by the same percentage from the end of 2019 to the end of 2021. A decreasing PE ratio usually shows decreasing dividends or price growth expectations by financial markets.

Despite this decrease, PE ratios of the laggard and leader are in line with their levels at the beginning of 2021. Moreover, equity investors are ready to pay about the same amount for a euro of earnings of the laggard or the leader.

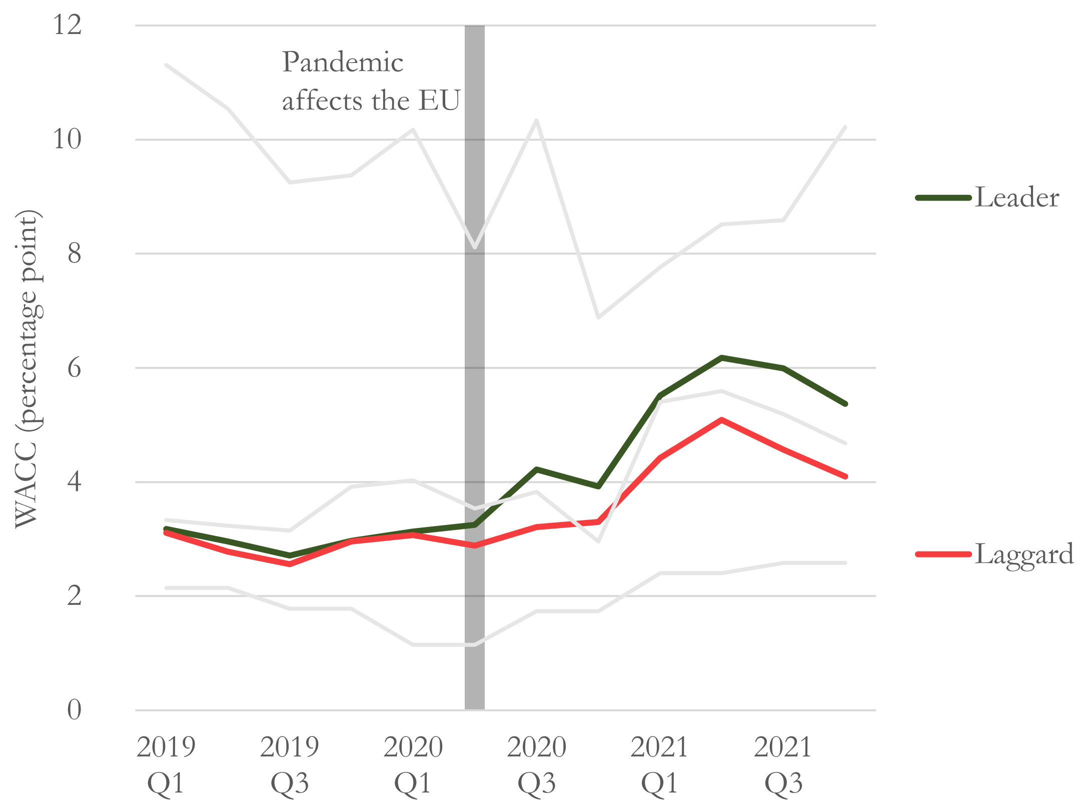


PE ratio per category, from 2019 Q4 (left bar) to 2021 Q4 (right bar).

Compared to before the Covid crisis, financial markets deem both the laggard and leader riskier

Finance GMSI 50

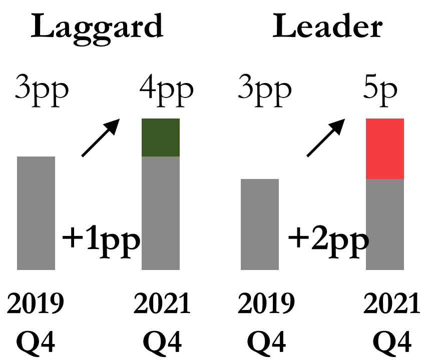
Figure 4: WACC of EU automakers (3-month average)



Lines show underlying companies' WACCs (the green line shows the leader, the red one the laggard, the grey the other companies in our sample).

The leader's Weighted Average Cost of Capital (WACC) increased more over 2020 and 2021 than the laggard's. An increasing WACC shows that financial markets are perceiving a company as more risky.

The WACC of the leader almost doubled during 2020 and 2021, while the laggard's WACC increased at a slightly slower pace. Moreover, financial markets deem the leader riskier than the laggard, which suggest higher costs of capital for green investments.



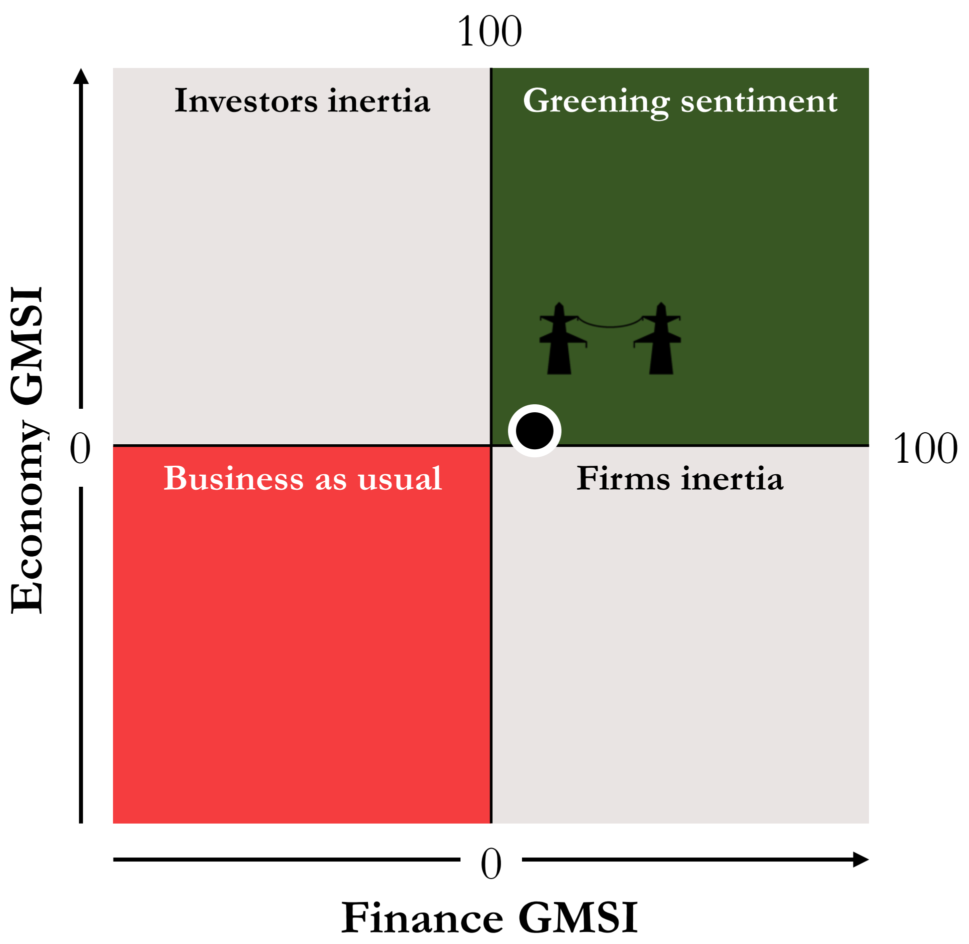
WACC per category, from 2019 Q4 (left bar) to 2021 Q4 (right bar). Pp = percentage point.

Power sector

A very slight greening sentiment characterises the recovery of the power sector from the Covid crisis

Power firms show a slightly greening sentiment over 2020 and 2021. In 2021 their production plans lean more towards the low-carbon transition than they did before the crisis. This improvement is due to the anticipated higher development of low-carbon capacity. **Our results suggest that financial markets are aligning with real markets' sentiments**. Capital flows indeed relatively more to leaders than laggards. However, financial markets expect laggards to be *more* profitable at the end of 2021 than at the end of 2019 (returns, PE ratio). Moreover, the average change in perceived riskiness during the crisis is similar for both leaders and laggards.

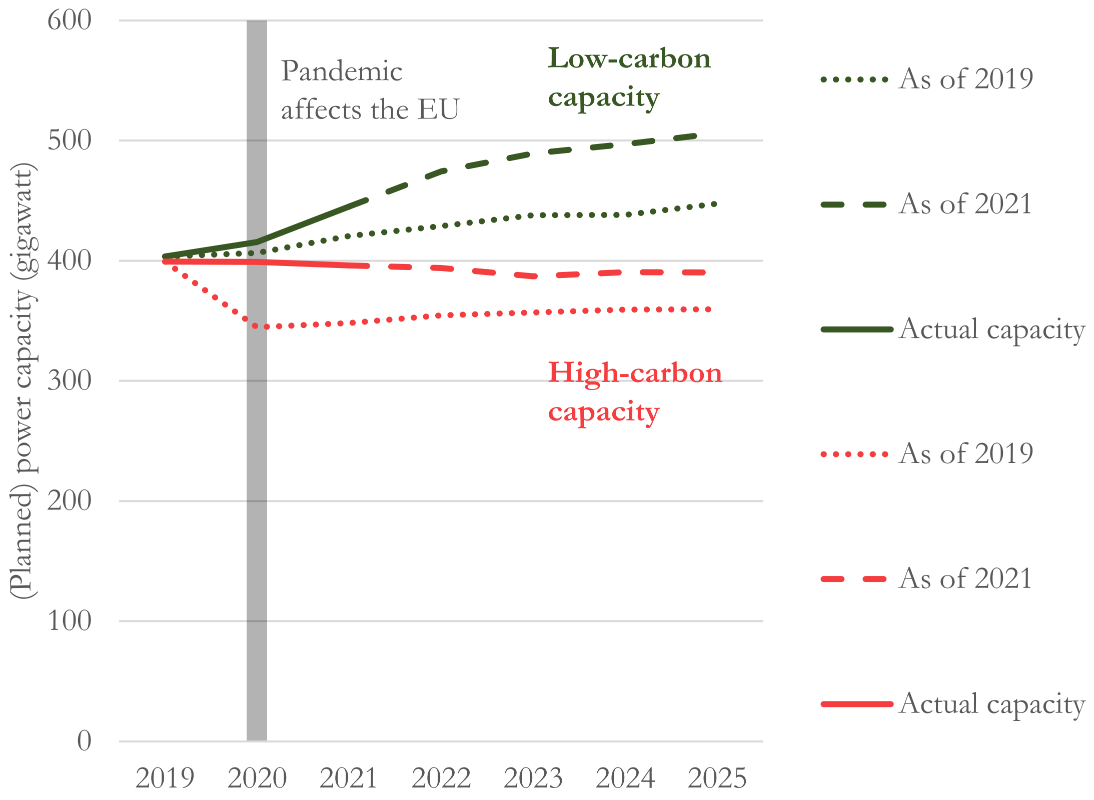
We characterise the situation as a very slight greening sentiment. Firms' and investors' sentiments lean towards a slight acceleration of the greening of the sector. Capital is looking for low-carbon opportunities, while firms are, overall, looking at developing low-carbon capacity. The greening of anticipations is however strongly limited by an increase in planned high-carbon capacity, by relatively positive anticipations of laggards' performance and growth (returns, PE ratio), and by an increase in perceived riskiness of leaders (WACC).



Compared to before the crisis, EU power firms' anticipations are slightly greener

Economy GMSI 52

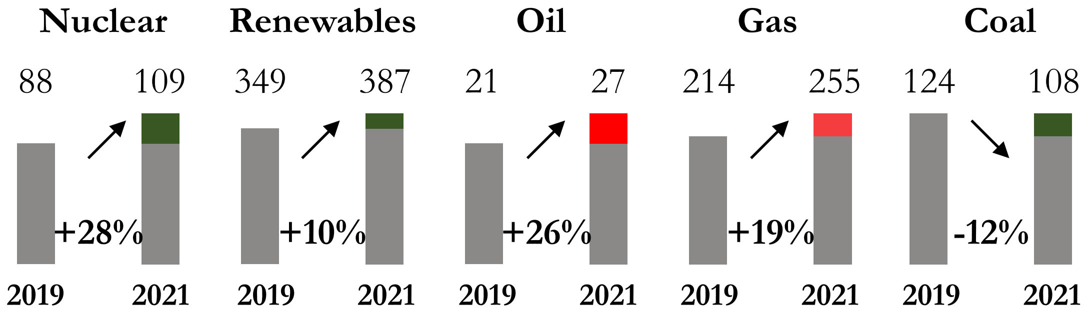
Figure 5: Planned high- and low-carbon power capacity by EU power firms



Over 2020 and 2021, EU firms significantly increased planned low-carbon capacity but also increased high-carbon capacity.

This relates to the EU policy context:

- EU countries invested or plan to invest at least €25 billion in renewables capacity as part of recovery policies, likely contributing to the observed expansion of planned capacity.[4]
- EU governments also support the development of gas capacity to replace coal or in search of standby or baseload capacity.[5]

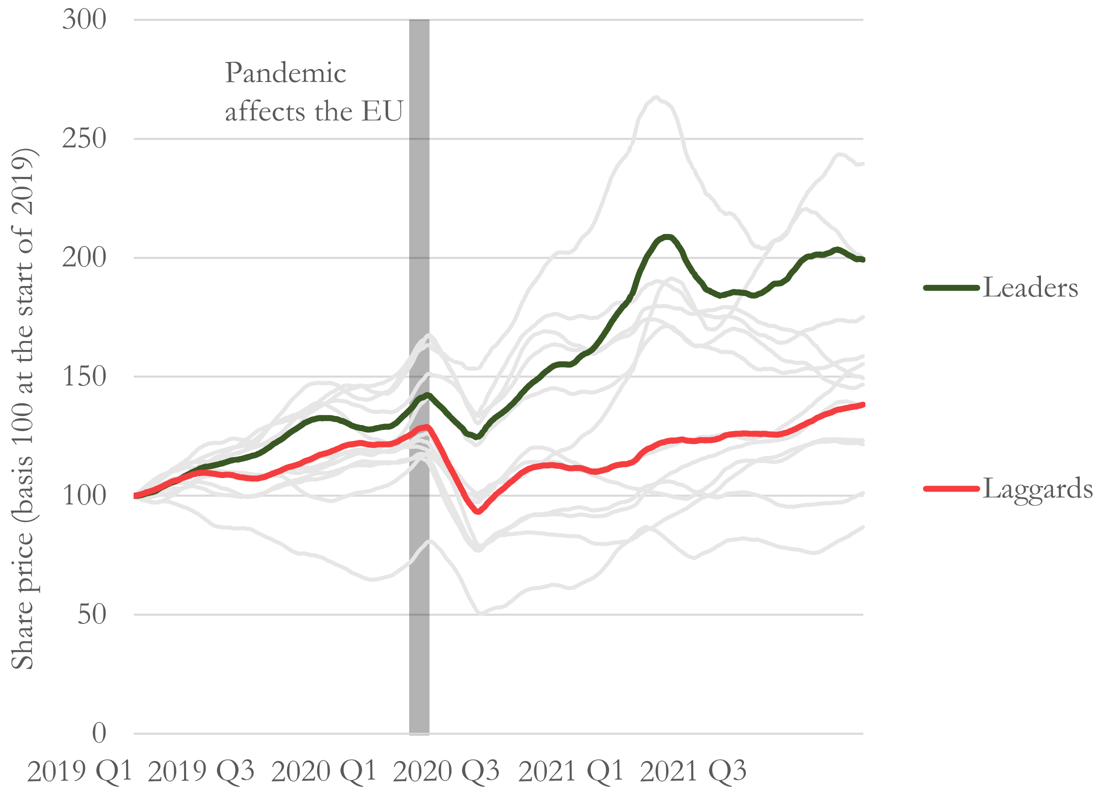


Planned capacity for 2024, as of 2019 and 2021, in GW.

Compared to before the Covid crisis, financial markets are more confident in leaders but also laggards performance

Finance GMSI 54

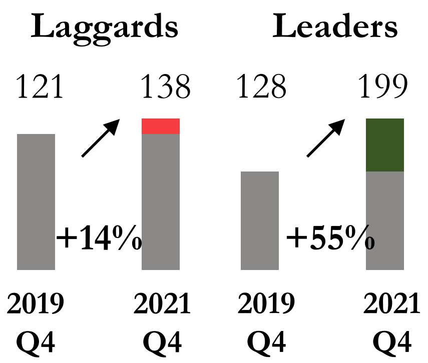
Figure 6: Share price returns of EU power firms listed in the Stoxx Europe 600 (50 days moving average)



Grey lines show underlying companies' share prices, brought to a basis of 100 at the start of 2019. The green line is the average of leaders, the red line is the average of laggards.

Share price returns of leaders over 2020 and 2021 are stronger than for laggards.

After facing negative price returns when the pandemic reached the EU, power firms mostly enjoyed positive price returns over 2020 and 2021. Among them, leaders enjoyed, on average, very strong positive returns and largely overperformed laggards.

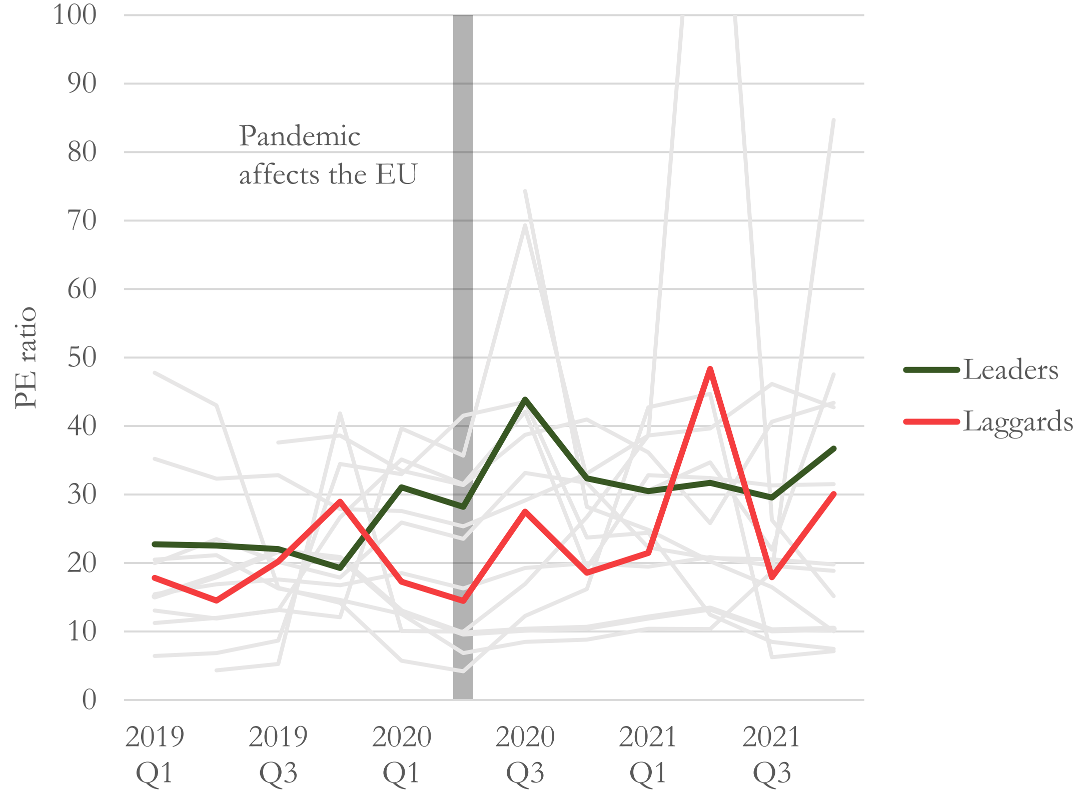


Share price returns per category, from 2019 Q4 (left bar) to 2021 Q4 (right bar). Share prices = 100 at the start of 2019.

Compared to before the Covid crisis, financial markets expect leaders to deliver more dividends/share price growth

Finance GMSI 54

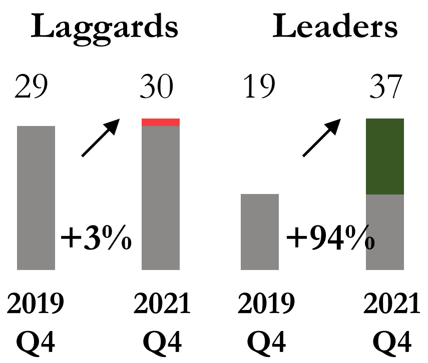
Figure 7: PE ratio of EU power firms listed in the Stoxx Europe 600 (3-month average)



Grey lines show underlying companies' PE ratios. The green line is the average of leaders, the red line is the average of laggards. Absence of observation means the ratio is negative, and therefore not applicable.

Compared to before the Covid crisis, the average PE ratio of leaders nearly doubled, while it remained stagnant for laggards.

Moreover, the average PE ratio of leaders is slightly above the one of laggards, indicating that investors are ready to pay more for a euro of earnings of a leader than a laggard. This indicates that equity investors seem to expect higher dividends or share price growth of the leader than the laggard in the near future.

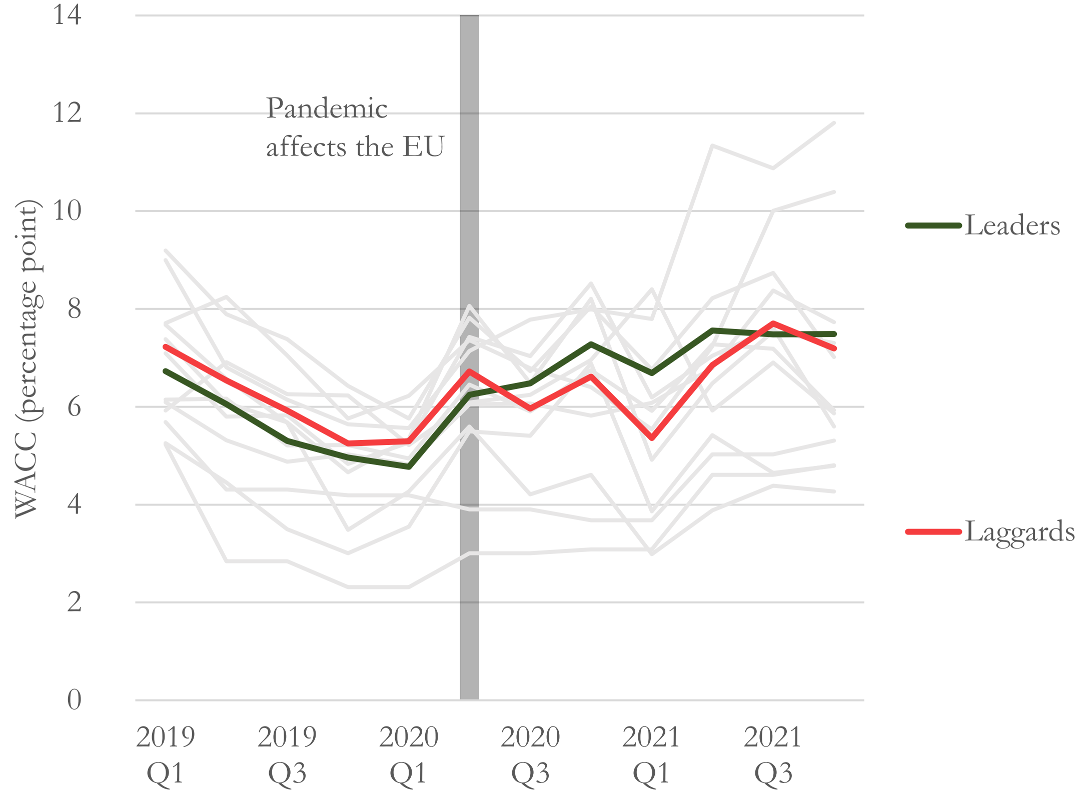


PE ratio per category, from 2019 Q4 (left bar) to 2021 Q4 (right bar).

Compared to before the Covid crisis, financial markets deem laggards and leaders, in average, riskier

Finance GMSI 54

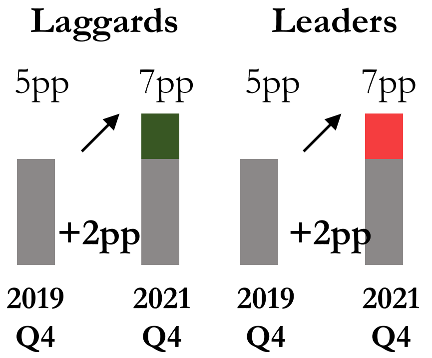
Figure 8: WACC of EU power firms listed in the Stoxx Europe 600 (3-month average)



Grey lines show underlying companies' WACCs. The green line is the average of leaders, the red line is the average of laggards.

On average, both leaders and laggards' WACCs increased during 2020 and 2021.

Current average WACC levels of laggards and leaders are however broadly in line with beginning of 2019 level. Moreover, investors do not seem to consider companies lagging behind the low-carbon transition as riskier than companies leading it. Their respective average WACCs are very similar throughout the analysed period.



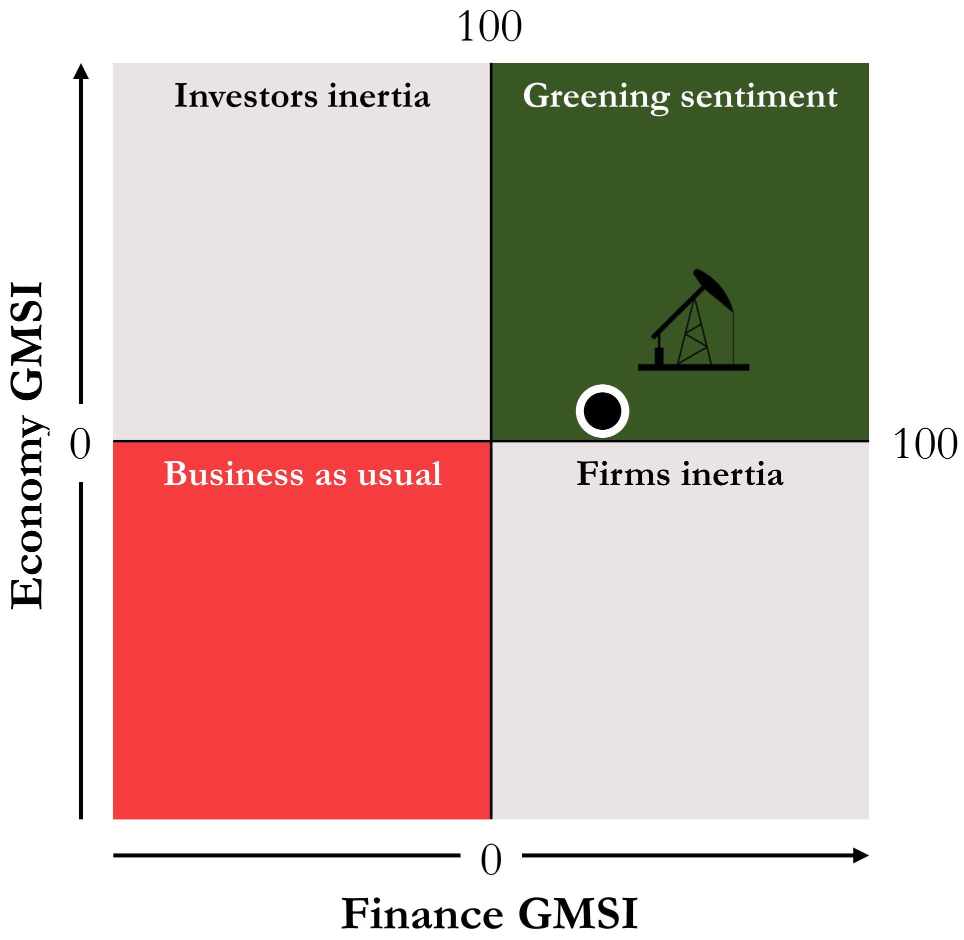
WACC per category, from 2019 Q4 (left bar) to 2021 Q4 (right bar). Pp = percentage point.

Oil & gas sector

A slight greening sentiment characterises the recovery of the oil & gas sector, although the indicator is at the border of firms inertia

Oil & gas firms show a slight greening sentiment over 2020 and 2021. Their plans of extraction are lower in 2021 than in 2019, despite oil extraction being planned to increase *compared to its actual 2021 level*. This is likely tied to reduced demand due to the lasting crisis rather than to the low-carbon transition. **Our results suggest that financial markets have relatively pessimistic anticipations concerning the oil & gas market**. Compared to before the Covid crisis, they expect less performance and more risk linked to oil & gas firms.

We characterise the situation as a slight greening sentiment. Firms' and investors' sentiments are converging towards a sluggish recovery of the sector. This greening of anticipations is however limited by a planned increase in oil extraction *compared to its actual 2021 level* and by a progressive recovery of oil & gas firms' equity prices in 2021. As a result of this recovery of equity prices, the trend is pointing towards the indicator moving to investors inertia over the course of the next months / year.



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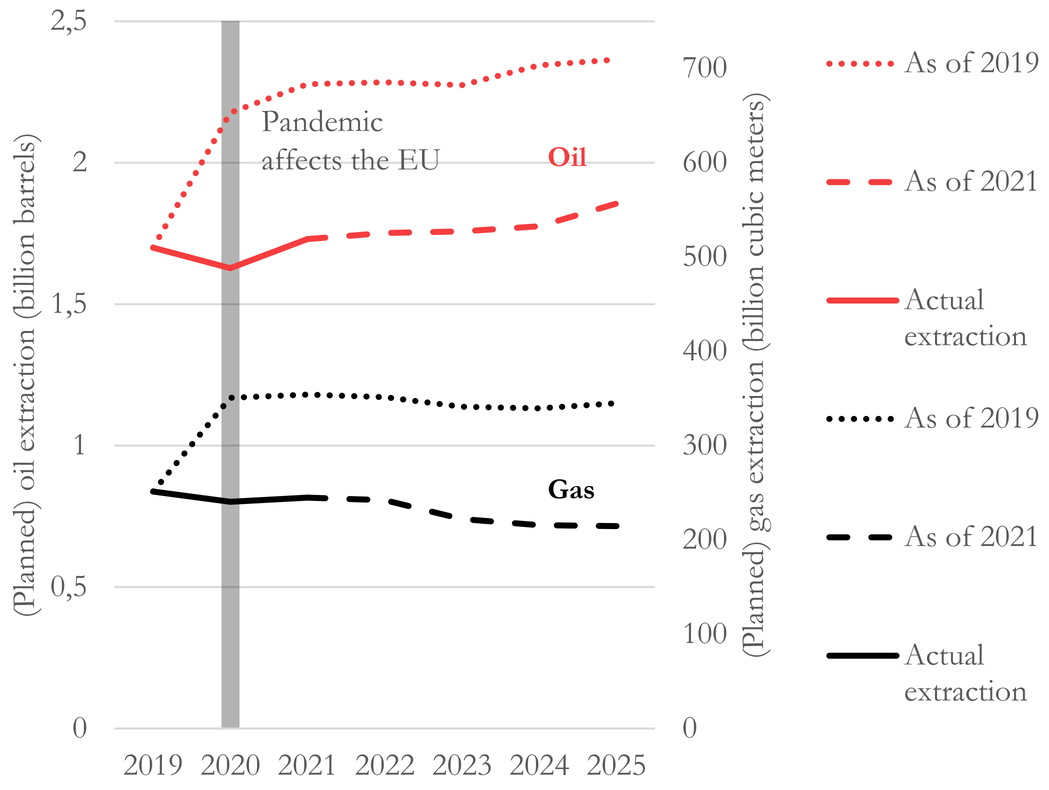
Compared to before the crisis, EU oil & gas firms anticipate a less dynamic market

Economy GMSI 54

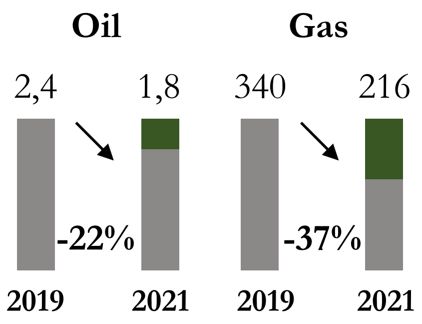
Figure 9: Planned extraction of oil & gas by EU oil & gas firms



Over 2020 and 2021, planned extraction of oil & gas decreased significantly.

The anticipations of oil & gas firms likely reflect downward pressures on demand:

- Covid may have lasting effects on oil & gas demand (lasting impact on the economy and behaviours).[6]
- EU firms still plan to increase oil extraction *compared to its actual 2021 level,* likely tied to the fact that demand is expected to progressively recover.[7]



Planned extraction for 2024 as of 2019 and 2021, in billion barrels (oil) and billion cubic meters (gas).

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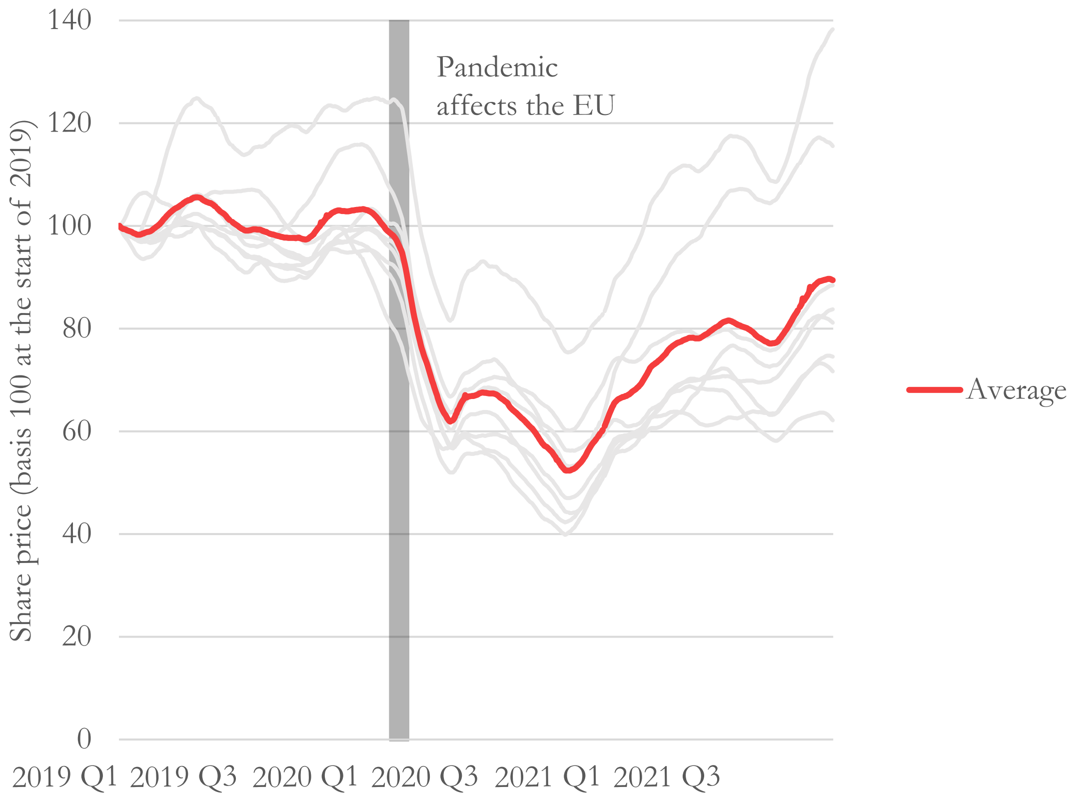
Compared to before the Covid crisis, financial markets expect a weaker performance of oil & gas firms

Finance GMSI 65

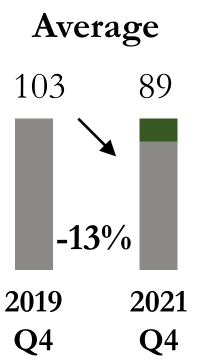
Figure 10: Share price returns of EU oil & gas firms listed in the Stoxx Europe 600 (50 days moving average)



Grey lines show underlying companies' share prices, brought to a basis of 100 at the start of 2019. The red line is the average of laggards.

On average, oil & gas firms lost close to 50% of their equity value during the crisis.

Their equity prices are however progressively recovering. At the end of 2021, the average equity price of EU oil & gas firms is *only* 13% less than at the end of 2019.



Average share price returns of oil & gas firms, from 2019 Q4 (left bar) to 2021 Q4 (right bar). Share prices = 100 at the start of 2019.

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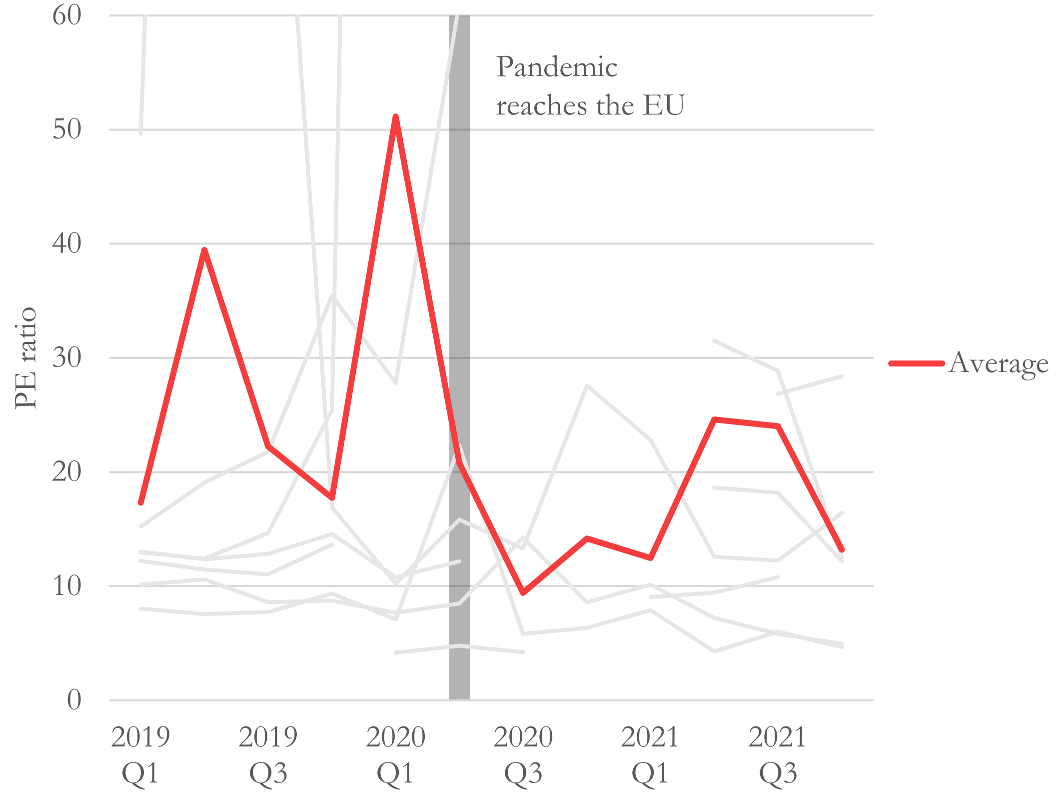
Compared to before the Covid crisis, financial markets expect lower dividends or price growth of oil & gas firms

Finance GMSI 65

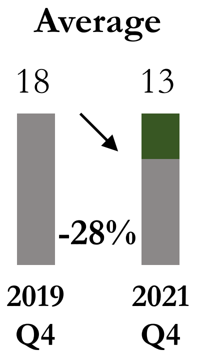
Figure 11: PE ratio of EU oil & gas firms listed in the Stoxx Europe 600 (3-month average)



Grey lines show underlying companies' PE ratios. The red line is the average of laggards. Absence of observation means the ratio is negative, and therefore not applicable.

The average PE ratio of oil & gas firms is lower at the end of 2021 than at the end of 2019.

The PE ratio of oil & gas firms increased significantly at the beginning of 2020, driven by a drop in earnings (not shown on this graph). At the end of 2021, it is lower than what it was at the end of 2019, likely showing a reduced attractiveness of the sector to investors.



Average PE ratio of oil & gas companies, from 2019 Q4 (left bar) to 2021 Q4 (right bar).

Compared to before the Covid crisis, financial markets consider investments in oil & gas firms as riskier

Finance GMSI

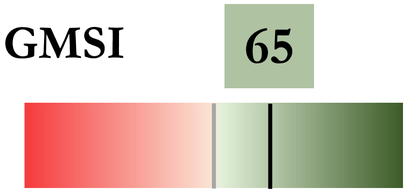
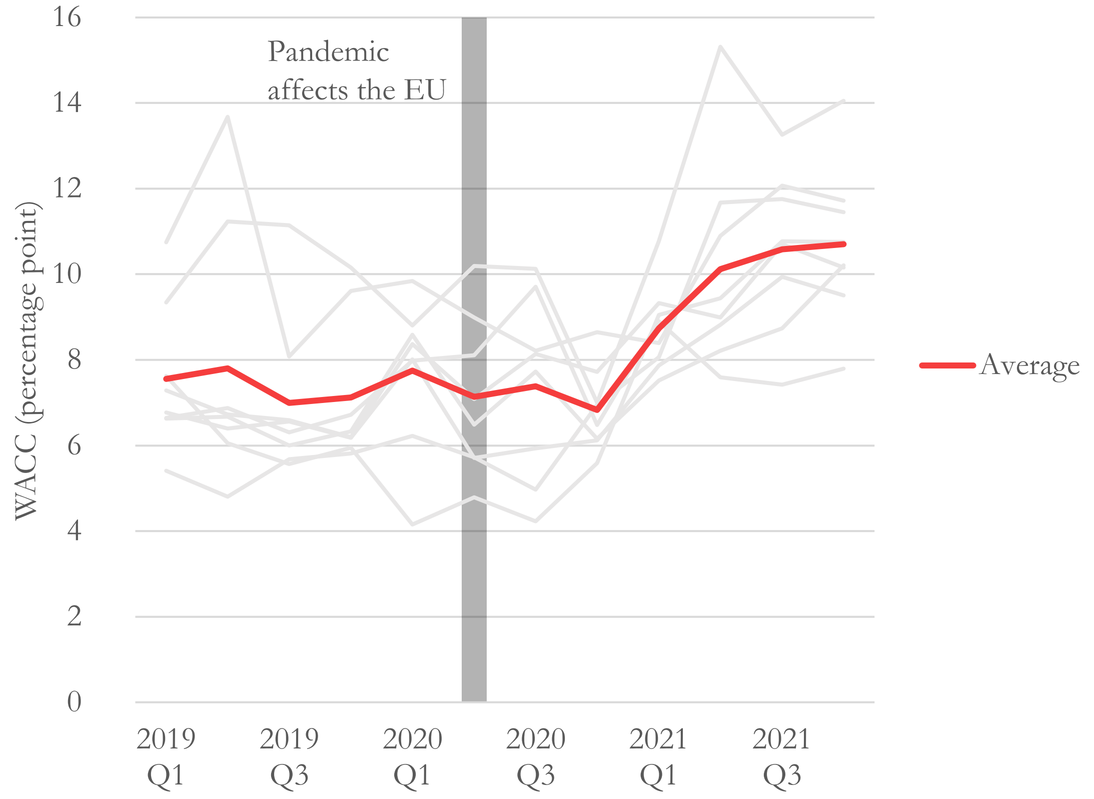


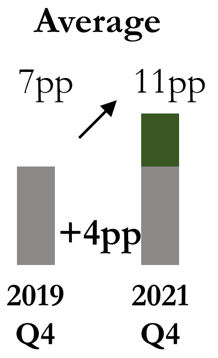
Figure 12: WACC of EU oil & gas firms listed in the Stoxx Europe 600 (3-month average)



Grey lines show underlying companies' WACCs. The red line is the average of laggards.

Oil & gas firms' average WACC shows a clear upward trend over 2021.

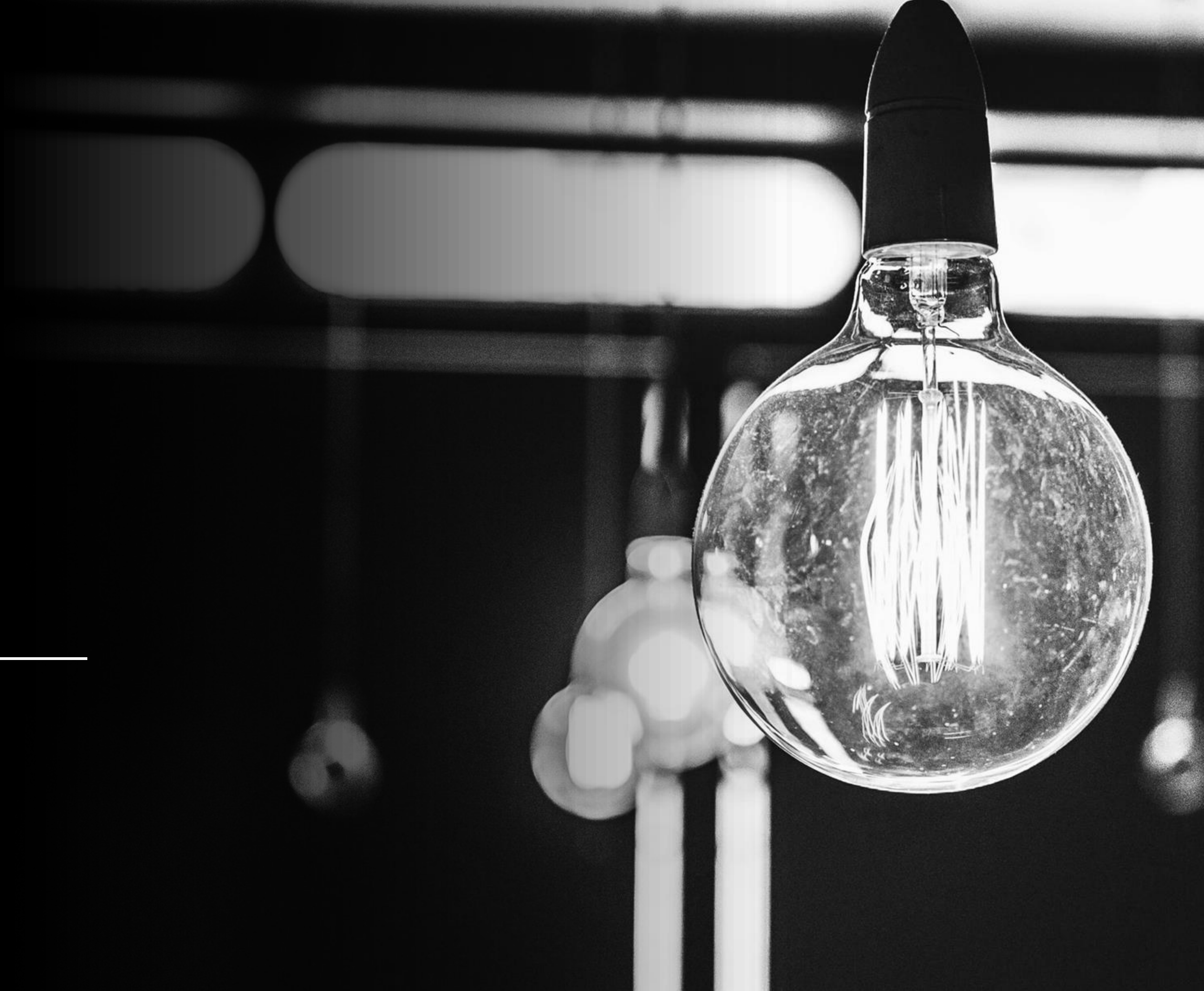
The average WACC of oil & gas firms reached 11% compared at the end of 2021, compared to a relatively stable WACC between 7% and 8% in 2019.



Average WACC of oil & gas companies, from 2019 Q4 (left bar) to 2021 Q4 (right bar). Pp = percentage point.

1 IN 1000

Insights for the green recovery of the EU



Based on our framework, we identified three risks that may jeopardise further greening of the economy as part of the EU's recovery from Covid

- **The risk of adding low-carbon to high-carbon power capacity rather than replacing the latter with the former.**

By 2024/2025, EU power companies will have built up their low-carbon capacity. In the meantime, they will broadly maintain high-carbon power capacity *to its actual 2021 level*. Decarbonisation requires, primarily, to phase out high-carbon production, which, based on our results, is overlooked by EU power firms.

- **The risk of seeing a reduction in oil & gas extraction wiped out by demand recovery.**

In the oil & gas sector, the reduction of high-carbon sales and production is likely tied to the economic turmoil triggered by government responses to the pandemic, rather than to a deliberate transformation of production. When such development is the case, oil & gas supply is likely to increase again when the economy recovers, as was the case after the 2008 financial crisis.

We will keep track of the green recovery of the EU, by publishing semi-annual updates of the Green Market Sentiment Indices in our **online dashboard.**

- **The risk that, despite broadly greening sentiments of financial markets, specific high-carbon activities remain well-financed.**

Our results suggest that financial markets have greening sentiments, but very slightly in the case of the auto sector (Finance GMSI = 50) and quite slightly for the power sector (Finance GMSI = 54). The detailed analysis of our financial indicators, *ie* the individual analysis of share price returns, PE ratio, WACC, reveals that, if financial markets show broadly greening sentiments, specific indicators are not fully aligned with a greening of the economy. For instance, financial markets expect a stronger performance of high-carbon power companies (share price returns indicator) as of the end of 2021 compared to as of the end of 2019. This implies that some laggards power companies have relatively better access to financing their (high-carbon) activities as of the end of 2021 compared to before the crisis.

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