

Futures of the European Capital Market

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ABOUT THEMIS FORESIGHT

Themis Foresight is a European business think tank that conducts research on future topics and develops future scenarios for companies.

Many entrepreneurs do not have the time in their day-to-day business to deal with possible futures and develop new business for their company in the long term. Yet it is precisely thinking ahead that makes it possible to recognize and exploit future options and avoid risks. We identify the key developments of the next 15 - 20 years. We examine which social, economic and political drivers and new technologies will influence and change the business models of companies and entire industries in the future.

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FOREWORD

This study and the scenarios it outlines concerning potential futures of the European capital market have been produced in close cooperation between Themis Foresight and the capital market department of NORD/LB. Few issues are as urgent as the renewable transition of our economy. We proudly and rightly call ourselves the energy transition bank, since we have been financing the expansion of renewable energies with great conviction for more than 30 years.

However, much greater effort is needed to reach the European Union's climate target of becoming climate-neutral by 2050. Just at the beginning of this year, Bloomberg calculated that USD 4.84tn per annum will have to be invested worldwide in the energy transition. Mobilising such investment sums requires the commitment of all the players in the European capital market.

We have asked ourselves whether the structure of today's European capital market is performing well enough to make the necessary contribution to this task. If it were to remain unchanged, the banking sector alone would have to grow by almost 300% by 2050. That is unrealistic. We therefore analysed in four possible scenarios how financing the energy transition can nevertheless be achieved by 2050.

We see two crucial levers: We need a capital markets union that removes the current uncertainty around investments in climate neutrality in the EU. And, alongside a strong and growing banking sector, we need an even stronger and dynamic asset management industry capable of investing in the climate neutrality of our economy.

For decision-makers in the financial world, industry and politics, this study provides insights and recommendations that we should take into account from now on. Our joint actions today will determine the economic and environmental legacy that we leave behind for future generations. Let's use this opportunity to transform Europe into a model of sustainability and economic resilience.



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EXECUTIVE SUMMARY

This study examines the future role of the European capital market in promoting the economy's transition towards net zero and, in particular, the success of the energy transition. At the beginning of the year, BloombergNEF presented the “New Energy Outlook 2024”. In this, the authors estimate that in order to achieve the 2050 net zero targets, USD 4.8tn will need to be invested in the global energy transition each year between 2024 and 2030. Between 2031 and 2040, the annual figure will increase to USD 6.6tn, before rising to USD 7.6tn in the decade from 2041 to 2050.

Based on these numbers, a team from Themis Foresight and the Capital Market department of NORD/LB broached the subject as to whether the European capital market is performing well enough to make its contribution to achieving this goal. And, if not, what needs to be done to achieve it.

The key findings:

- There is enough capital available to finance the energy transition. Allocation remains the main problem.
- The net zero transition in Europe is currently being largely managed by banks. A bank-centric approach is, however, inefficient and ineffective for moving sufficient capital at the necessary speed. Asset managers, banks and also governments must play a more important role in financing the energy transition.
- Fragmentation of European capital markets limits the system's ability to raise and allocate capital for green investments. Unification is required to bolster the strength of the European capital market.
- The EU member states and the EU itself are the main beneficiaries of climate investments and are in the best position to use their leverage as guarantors.
- Minimising the risk of investments in Europe and in developing markets is a major challenge for net zero financing.

We outline four scenarios to illustrate the possible futures of the European capital market:

- ***“The Great Reform”*** envisions a coherent, innovative financial landscape with a completed capital markets union that enables an efficient flow of capital into sustainable investments. This scenario requires considerable political will and structural changes.
- ***“Capital Market of Two Speeds”*** describes a two-tier system, in which a core group of EU countries drives financial integration, while other member states follow more slowly. Banks hold long-term assets and concentrate on stability.
- ***“Competing National Clusters”*** describes a fragmented market with regional financial centres competing with each other and forming alliances, leading to different approaches to net zero financing and innovation. This scenario puts the emphasis on adaptability and competitive innovation.
- ***“Triumph of Realpolitik”*** reflects a fragmented market dominated by national interests and conservative policies, leading to cautious green investments. This scenario prioritises stability and long-term risk management.



The report concludes that “The Great Reform” scenario offers the most promising solution for reaching climate financing targets. To achieve this future, important measures are needed, such as completing the capital markets union, diversifying the investor base to reduce dependency on banks and minimising the risk of green investments through government guarantees and public-private partnerships. These changes are indispensable for the transition to an integrated, resilient financial system that can support Europe’s net zero transformation and position the EU as a leader in sustainable finance and innovation.

During the study, we repeatedly spoke with 16 experts from six countries as part of in-depth interviews about possible futures for the European capital market and sparred with eleven other experts on the scenarios presented. We would like to thank the experts for their commitment and willingness to give up their time for these interviews and sparring sessions.

Our thanks also go in particular to Martin Hartmann, Head of Markets NORD/LB, and Jens Dierksen, Head of Markets Strategy and Floor Research at NORD/LB, for their close collaboration on this project.



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INTRODUCTION

The British historian Peter Frankopan powerfully demonstrates in his book “The Earth Transformed: An Untold History”¹ that in the history of mankind **the civilisations that prospered were those who adapted the best to changing climatic conditions.**

It is obvious that **the European capital market is currently not efficient enough to guarantee the financing of the necessary net zero transition of the economy.** As this study will explain in detail, fragmentation of the European capital markets, over-reliance on bank financing and insufficient allocation of capital to the energy transition are the main obstacles. Without swift and far-reaching reforms, Europe is in danger of losing its leading role in the area of sustainable investment. This would have serious economic and environmental consequences. While the European capital market can certainly be reformed effectively, it just seems like there is a lack of will to get on with it.

In Europe, there is a glaring discrepancy between political rhetoric and economic reality. After decades of negotiations, ambitious targets have been successfully formulated on a global scale. It is now a matter of finding the best market mechanisms and instruments to best fuel the net zero transition of the economy. In this field, different solutions are competing with each other to find the best way forward. It is true that the European Union occupies a leading position internationally in terms of green investments, but we must be cognisant of the fact that the European capital market is not performing nearly well enough to achieve the defined targets.

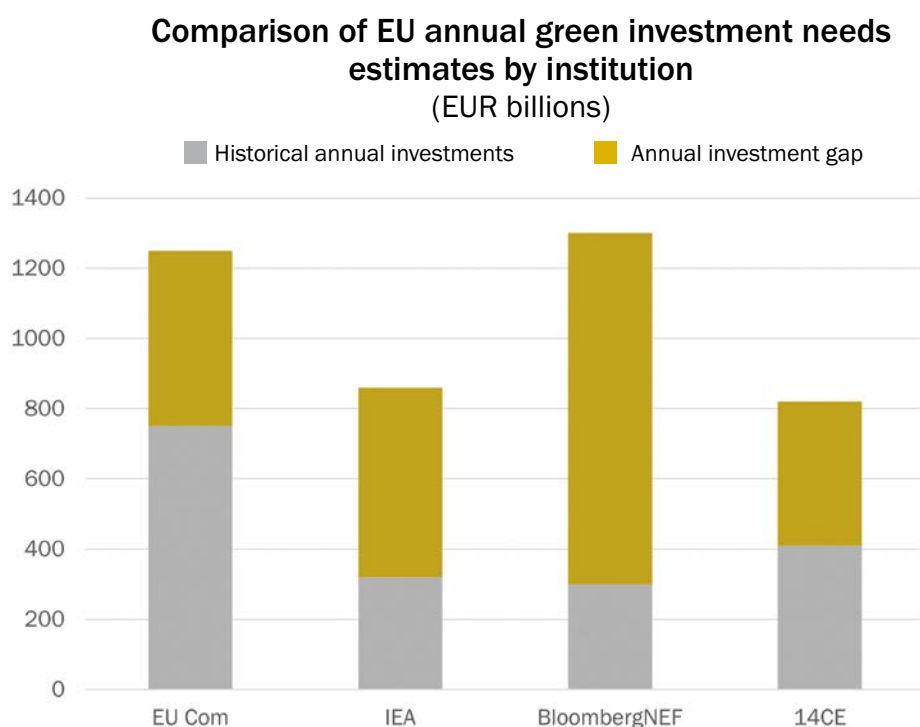
Capital market players now face a defining moment: should they continue to rely on traditional financing mechanisms, or must they innovate to develop and adopt new approaches? The future approach for the European capital market must be clarified quickly because, as the European Central Bank stresses, there is an enormous green investment gap (see Fig. 1).

We discuss exactly what these approaches might look like in four future scenarios in this study. To get straight to the point: each of the approaches involves large and uncomfortable changes that will require bold decisions. However, we shall leave it to the readers of this study to weigh up these approaches and the associated uncertainties.

The uncertainties surrounding the shape of the future European capital market are exacerbated by several factors at a macro level:

1 Frankopan, P.: The Earth Transformed: An Untold History, Rowohlt, 2023

Fig. 1: Comparison of estimates of the EU's annual green investment needs by institution. Source: European Central Bank, Financial Integration and Structure in the Euro Area, 18 June 2024 [[Link](#)].



The global order is undergoing a fundamental change. As explained in detail in our study “The European economy in a New World Order”², the economic, political and military ascendancy of the Global South is calling into question the hierarchy of the global order after the Second World War. It will permanently change trade flows, investment patterns and innovation paradigms. The European economy must navigate this landscape and recalibrate its role in the global trading and financial system.

The concept of economic growth is being tested – especially in the global West. The net zero transformation of the economy is unfolding in the midst of two large competing narratives, with one positing sustainable “green growth” and another advocating a “post-growth” model. The two approaches may have attractive names, but both are engaging in disingenuous window-dressing. Green growth is not, as is often claimed, capable of decoupling economic growth from the use of natural resources. A post-growth economy will not be able to avoid making massive interventions in the democratic mechanisms on which Western societies are based. We need to break through both narratives and replace them with a better one if we want to continue following democratic principles and ensure the financing of democratic development through a strong economy.

² Berger J., Hesjedal, S., Hoefnagels, J., Boehlke, E., The European Economy in a New World Order [[Link](#)] and Five Scenarios for European Business in a New World Order [[Link](#)]

The Western economic model is at a turning point. For seven decades, Europe, the USA and Japan have lived off high-tech exports and benefited long term from keeping developing regions of the world dependent on these technologies. However, the rise of China and, in future, also India³ in mastering the key technologies of the future no longer provide any scope for retaining the current economic model. While new economic powers emerge, Europe must redefine its competitive advantages and innovation areas. What these will look like will be the subject of a coming Themis Foresight study. This shift will strongly influence the focus and structure of its capital market. Important questions must be discussed, such as: What will Europe's new economic model look like? What economic and foreign policy must be pursued to achieve this? And how will European prosperity be safeguarded internationally?

And finally: **The future of European integration remains uncertain.** The European Union must decide whether it wants to remain a union of self-serving states or whether it wants to develop into a coherent economic, political, social and military entity. The direction it chooses will have far-reaching consequences for the integration of capital markets across the continent as a whole.

The above-mentioned factors provide an important context. This study focuses on the ability of the European capital market to rapidly and above all expediently mobilise the enormous amount of capital required for the net zero transformation of the economy. At present, it is probably the most crucial factor for shaping Europe's economic future and global competitiveness. Our future scenarios for the European capital market demonstrate what must be achieved within the key development paradigms on the European capital market in order to make this transition a success.

3 See also Gaida, J., Wong-Leung, J., Robin, S., Cave, D., Critical Technology Tracker – The global race for future power [\[Link\]](#)



THE FINANCING NEEDS FOR THE ENERGY TRANSITION

BloombergNEFs “New Energy Outlook 2024” estimates in its net zero scenario that a fully decarbonised global energy system by 2050 could come at a cost of USD 215tn.⁴ Therefore, accelerated and significant investment is vital to the successful transition to a low-carbon economy.

As of now, for every dollar invested in fossil fuels, three dollars must be put towards low-carbon energy solutions. This represents a significant shift from the current balance between investment in fossil fuels and clean energy. The majority of this capital will be spent on expanding e-mobility, renewable energy sources, improving energy storage capacity and modernising the electricity grids in order to be able to cope with the increased capacity of renewable energies.

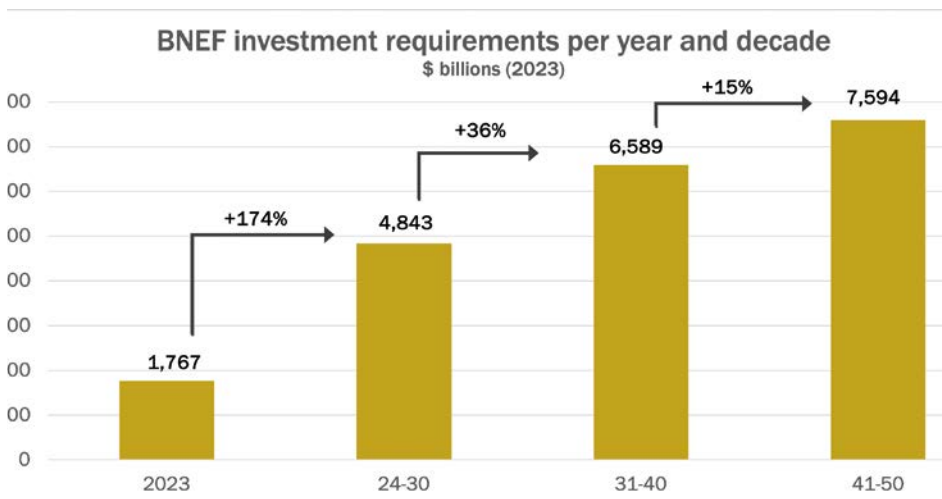


Fig. 2: Investment needs per year and decade according to BNEF.

Global investment in the energy transition hit a record high in 2023 of almost USD 1.8tn, up 17% on the previous year. However, according to BloombergNEF, the world will have to invest USD 4.8tn per year in the years up to 2030 in order to achieve the goals of the Paris Agreement. This is a massive increase of 174% as against 2023. With a share of 20.38%, the EU financial sector contributed USD 360.5bn in 2023. If we take the figures from the BloombergNEF Net Zero Scenario as a basis, **the scale of investment by the EU financial sector would have to increase to USD 987bn per year by 2030.**

⁴ Fargat, A., Rath, A. “Is Net Zero by 2050 Still Possible? Yes, But It’ll Cost 19% More” [\[Link\]](#)

THE POTENTIAL OF THE GLOBAL CAPITAL MARKET

These figures may initially be disconcerting, but there is fundamentally sufficient capital available worldwide. State Street Global Advisors puts the value of global assets available for investment in 2023 at USD 165tn, with sovereign wealth funds alone accounting for USD 10tn of this.⁵ The world's largest asset manager BlackRock manages assets worth USD 9.1tn.⁶ The EU banking sector, which has financed the bulk of the energy transition to date, has assets worth USD 32tn.⁷

The solution to a successful energy transition therefore lies in correctly allocating the capital already available on the capital markets.

As will be explained below, particularly non-bank-based capital market players in the EU have an abundance of untapped potential. By way of comparison: the total investments of US long-term investors (private households, pension funds, insurance companies, etc.) amount to 622% of US GDP. The large EU investors only have investments worth 200-300% of their GDP. In Europe, Germany is in last place with only 229%. The Nordic countries, which traditionally have a strong asset management industry, come close to or even surpass the USA. This highlights the EU's diverse landscape.⁸

Direct foreign investment is another crucial aspect of the global energy transition. Already hampered by complicated regulations and high risks, these investments have declined in recent years due to Russia's invasion of Ukraine, the energy price shock and inflation. UNCTAD calculates that foreign investment fell by 10% in 2023 (not taking into account the fluctuations of some EU conduit economies). While developed countries have seen little change, Asian countries have been hit particularly hard with a reduction of 8%.⁹

Knowing that the capital is available for a net zero transformation of the global economy is some consolation, but that is by no means a reason to rest on our laurels. The last few years have shown that capital will not automatically be channelled into climate investments.

⁵ Gorshkov, V., Hentov, E., Investment Trends Among Sovereign Wealth Funds [[Link](#)]

⁶ Braz, P., Largest asset managers by AUM in 2024 [[Link](#)]

⁷ BloombergNEF

⁸ Oliver Wyman, The Capital Flywheel, European Capital Markets Report, May 2024 [[Link](#)]

⁹ UNCTAD, World Investment Report 2024 [[Link](#)]

The mobilisation problem in Europe can be reduced to three main factors, namely

1. the fragmentation of the European capital markets,
2. the disproportionate role of banks in the European capital market
and
3. the risk level for green investments

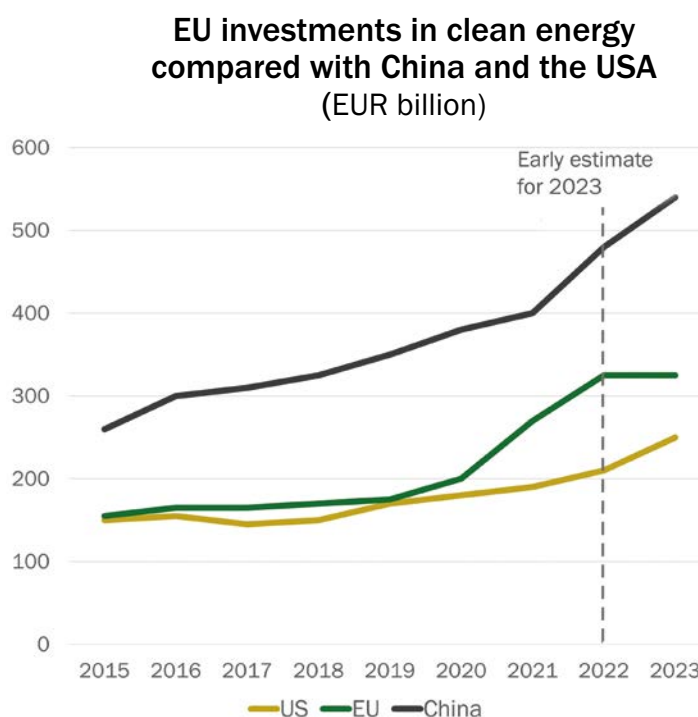
The European capital market must take these aspects into account in order to achieve a desirable future where the investment targets calculated in the BloombergNEF Net Zero Scenario are achieved. We take a closer look at these factors in the following sections.



THE PERFORMANCE OF THE EUROPEAN CAPITAL MARKET

Compared with most other economies, especially the USA, the EU has robust clean energy investment figures. Fig. 3 shows that the EU invests more than the USA, but lags way behind China.¹⁰

Fig. 3: EU investments in clean energy compared with China and the USA.
Source: EIB Investment Report 2023/2024.



The EU's relatively strong investment figures are, however, more likely to be due to stricter climate regulations and a more active central bank than to the success of the capital market. The importance of the political landscape should not be underestimated, as changing market incentives and reliable regulations will play a decisive role in mobilising capital. The EU has the most committed political landscape, which has set itself the most ambitious targets (significantly more than the USA). It is more stable than China, as the resumption of fossil fuel use there and investment in the wake of the coronavirus pandemic has shown.¹¹ Governments will influence activity in the area of green financing in part through an increase in the carbon price, stricter reporting standards and financial risk regulations.

¹⁰ European Investment Bank, Investment Report 2023/2024 [\[Link\]](#)

¹¹ European Investment Bank, Investment Report 2022/2023 [\[Link\]](#)

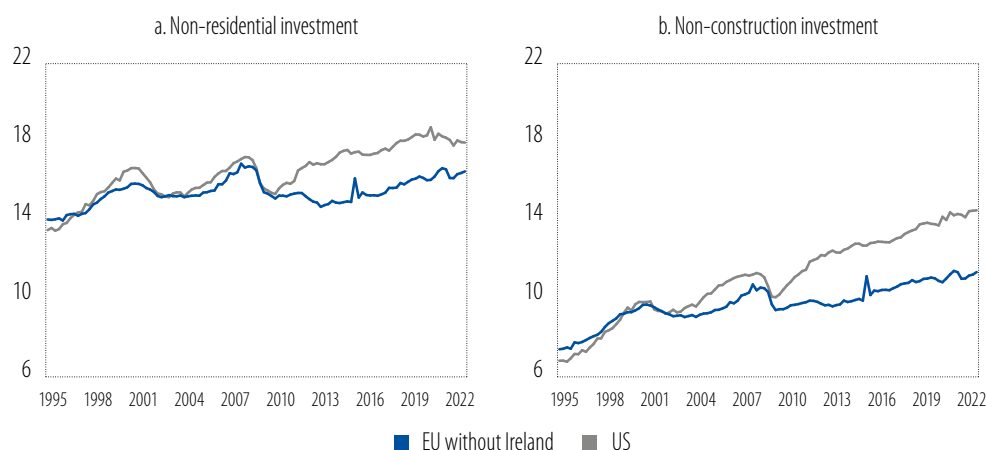


Regulations play an important role. However, the fundamental **ability of the capital markets to mobilise capital** is crucial. **It is in this regard that the European capital market is not nearly as efficient as it should be.** The attitude of the European Commission and the German government towards green investments shows a **tendency to allocate expensive capital to less productive assets.** While this approach is well-intentioned, it is by no means an effective strategy for achieving a substantial net zero effect.

A closer look at investment patterns in the EU compared with the USA illustrates this problem. For example, although the general rate of investment (ratio of investment to GDP) in the EU is somewhat higher than in the USA,¹² a closer examination shows a different picture. If you isolate productive investments - i.e. assets that are used directly for the production of economic output, such as equipment, intangible business capital and infrastructure - the USA invests 2% of GDP more than the EU. Focusing more on investments outside the construction industry (i.e. machinery, equipment and IP products), the gap widens to 3.8% of GDP (see Fig. 4).¹³ US investments were more effective at generating medium to long-term economic growth. This disparity suggests that there is a different culture and mindset on where the capital should be invested. **The limited green capital available must be used as productively as possible.**

Rates of productive investments in the European Union and the United States

Fig. 4: Comparison of productive investments EU – USA, source: EIB Investment Report 2022/2023 [\[Link\]](#)



¹² *ibid.*

¹³ *ibid.*

The approach within the EU cannot lead to an efficient use of capital. Substantial funds are tied up in projects that do not bring the greatest benefit in relation to their costs. For climate investments this specifically means that while large sums of money are spent, **the environmental and economic returns are unfavourable in relation to the capital invested**. This approach slows down the overall pace of net zero transformation and limits the development of more efficient, cost-effective solutions.

To achieve a greater climate impact, the political decision-makers in the EU and Germany should consider prioritising productive investments (including abroad). In specific terms, this means concentrating on innovative technologies, infrastructure for low-carbon industries and projects with a high potential for economic output and environmental benefits. **Redistributing capital from low to high-productivity green assets** could speed up the EU's progress in net zero transformation and simultaneously boost economic growth. This would be a sustainable and effective long-term approach to the climate transition.

Japan, for example, demonstrates what such a programme could look like: The Climate Transition Bond Framework provides for the issue of Climate Transition Bonds to promote decarbonisation and strengthen Japan's industrial competitiveness by investing in clean energy. The country is planning more than JPY 150tn (approx. USD 959bn) in private and public investments over the next 10 years. Of this figure, JPY 20tn will come from the issue of Japanese GX bonds, which are the world's first sovereign climate transition bond.¹⁴

A further element limiting the efficiency of the European capital market is its composition. In the EU, bank assets account for 163 percent of GDP¹⁵¹⁶. In the USA, the equivalent figure stands at just 87 percent by comparison.¹⁷¹⁸ Moreover, the share of equity capital financing in the EU as a proportion of GDP is only 66%. By contrast, it is 157% in the USA. This illustrates the considerable difference in the market structure (see Fig. 5).¹⁹ In the USA, there is also a more active secondary market with a constant equity turnover rate of around 145%. This suggests an extremely liquid trading environment, highlighting the EU's more bank-oriented financial system.

14 GR Japan, Overview of Japan's Green Transformation. 2023. [\[Link\]](#)

15 Trading Economics, European GDP [\[Link\]](#)

16 Statista, Total assets of the European Union (EU) banking sector from 1st quarter 2015 to 4th quarter 2023 [\[Link\]](#)

17 Trading Economics, US GDP [\[Link\]](#)

18 YCharts, US Banks Total Assets [\[Link\]](#)

19 Oliver Wyman, The Capital Flywheel, European Capital Markets Report, May 2024 [\[Link\]](#)

US and European capital markets

Fig. 5: Comparison of the European and US capital market. Source: Oliver Wyman, *The Capital Flywheel*.

		EU27		US	
		2016	2022	2016	2022
Primary market	Equity funding (% GDP)	48%	→ 66%	104%	→ 157%
	Corp. debt funding (% GDP)	74%	→ 69%	100%	→ 96%
Secondary market	Equity turnover velocity	68%	→ 52%	145%	→ 145%
	Equity turnover (% of GDP)	33%	→ 34%	151%	→ 227%
	Corp. debt turnover velocity	21%	→ 20%	40%	→ 39%
	Corp. debt turnover (% of GDP)	16%	→ 14%	40%	→ 37%
	Notional value traded (x cash sec.)	3x	→ 2x	32x	→ 32x
	Notional value traded (% GDP)	3x	→ 3x	80x	→ 82x
	Market share of global FX market	11%	→ 8%	20%	→ 19%
	Market share of global commodity	<1%	→ <1%	60%	→ 39%

Although the European market has gradually improved, it is still too small. And when capital markets are underdeveloped, companies struggle with increased and irregular financing costs due to their dependency on banks.²⁰ The EU's problems with a system dominated by banks, a fragmented market and unanswered questions on risk distribution are causing additional costs and high inefficiencies when it comes to climate investments.

²⁰ Pradhan, M. et al., A Capital market union for Europe [[Link](#)]

THE COST OF BANK FINANCING

The disproportionate influence of the banking sector on the capital market has a significant impact on the amount and speed of capital allocation. Both banks and asset managers, such as pension funds or insurance companies, must take into account risks that limit the amount of capital that can be deployed. However, banks operate within a stricter regulatory framework than asset managers for good reason, which restricts their flexibility and investment potential. Basel III forces banks to increase the amount of capital they have available, in particular higher levels of hard core (CET1) capital. Banks must meet the minimum requirements for the CET1 ratio to their risk-weighted assets (RWA). RWA serves as a benchmark for determining the minimum capital requirements for a bank in relation to its risk exposure. The current aggregated CET1 ratio for banks is 15.61%²¹, i.e. if a bank has risk-weighted assets of EUR 100bn, EUR 15.61bn must be held as CET1 capital. This means that if the bank's risk-weighted assets increase, its CET1 capital also has to go up.

Asset managers, on the other hand, also have to meet regulatory requirements. However, generally speaking, these are motivated purely by returns in their actions. Unlike banks, they do not have to build up equity if they want to increase their balance sheet total. This means asset managers can make investments without any capital requirements. This additional flexibility not only means that they can take more risks, but that they also have more capital available for investments.



21 European Central Bank, press release 12 January 2024 [\[Link\]](#)

*So, if the energy transition
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twenty years.*



So, if the energy transition is to be largely managed by banks, then the banking sector in Europe will have to achieve gigantic growth over the next twenty years. To illustrate this point further: assuming that until 2045

- the current structure of the EU capital market remains unchanged with 65% of the assets in the hands of banks²² and
- the EU takes on 25% of the USD 7.6tn needed in 2045 according to the BNEF Net-Zero Scenario,

then the EU banking sector's energy investments would have to **grow by 300%** between 2023 and 2045. This does not even take into account the additional capital needed for the CET1 requirement.

In principle, such a development is possible through a number of different decisions. However, we are currently not picking up any signals from either politicians or the banking sector that suggest such a trend is likely. It is, however, also conceivable - and this would be the best news for the net zero transformation of the economy - **that the composition of the EU capital market will change and that banks will cede some influence on the capital market in favour of asset managers.** Even in such a scenario, the banking sector would still have to grow significantly in absolute terms.

The bank-centric model is not only costly, but also slower for mobilising capital due to structural limitations. Banks are heavily reliant on customer deposits, which requires a high level of liquidity to cover withdrawal needs. This liquidity requirement limits the amount of capital that banks can provide for **long-term** investments and slows down the speed with which they can mobilise funds for large projects such as climate financing. In addition, the highly regulated nature of banks leads to lengthy approval processes for loans and investments, which entails additional time delays compared with the more flexible processes of asset managers.

By contrast, a more balanced market with a robust asset management industry can speed up the mobilisation of capital. Asset managers typically work with a variety of funding sources, including private equity, venture capital and institutional investments, which are not subject to the same liquidity constraints as bank deposits. This diversity enables them to make larger sums of money available more quickly for long-term investments. In addition, asset managers often have expertise in niche sectors and advanced risk management techniques. This means they can spot and exploit investment opportunities more quickly and efficiently. This agility and sector-specific knowledge

22 Climate Policy Initiative, Global Landscape of Climate Finance 2023, November 2023

[\[Link\]](#)

enables asset managers to better support the rapid deployment of capital, particularly in areas critical to the energy transition and other green investments.



THE COST OF A FRAGMENTED EU CAPITAL MARKET

The European capital markets are currently restricted by fragmentation. It hampers their potential to drive economic growth and be globally competitive. This fragmentation is the result of regulatory discrepancies, different market practices and inconsistent political framework conditions in the EU member states. The consequences are significant, with irregular capital flows, higher costs for companies, limited innovation and missed opportunities for macroeconomic stability. As global competition is intensifying and the need for sustainable financing is growing, fragmented European markets run the risk of falling behind. This underlines the urgency for unification.

To overcome these challenges, a concentrated effort to unify the European capital markets is crucial. The Capital Markets Union is an example of this initiative. It is aimed at creating a unified, integrated market for all member states. Important steps for unification are harmonising regulations, improving access to capital, centralising the infrastructure and aligning with global standards. Standardising securities legislation, disclosure requirements and insolvency procedures across the EU would drastically reduce cross-border investment barriers and promote a more coherent and efficient market environment.

Improving access to capital would be a further important consequence of a capital markets union. Creating standardised channels for venture capital, private equity and crowdfunding would serve to strengthen SMEs and start-ups, in addition to driving innovation and growth. This would not only increase economic momentum, but also improve the EU's competitiveness on the global stage. In addition, centralising infrastructure through standardised market data and setting up central clearing houses would improve transparency and efficiency, cut transaction costs and make European markets more attractive for domestic and international investors.

The effects of a unified European capital market would be transformative. Optimistic estimates assume that an additional 4,400 EU companies could raise EUR 470bn per year, while the long-term capital for climate finance could increase by EUR 12tn. The harmonised market would also improve financial stability, create more varied financing options and accelerate the use of green technologies. This would position the EU as a leader in sustainable finance

and innovation, in addition to driving the transition to a low-carbon economy.²³

By overcoming these barriers to unification, the EU can realise its full economic potential, drive innovation and lead the transition to a sustainable future. A unified capital market would not only benefit companies and investors, but also contribute to the broader goals of economic resilience, technological progress and climate protection. Given the increasing global challenges, a coherent European capital market is not only desirable, but also essential to safeguard the EU's future prosperity and influence.



23 Breen, C, Bierbaum, M., Wright, W., A Renewed Vision for EU Capital Markets, January 2024 [[Link](#)]

WHY EU GOVERNMENTS SHOULD TAKE RISKS

European governments are focusing on putting in place supporting regulatory frameworks, such as improving the availability of data on climate risks and using targeted public investments to promote private sector participation. However, they are reluctant to act as risk carriers for green investment. The reasons given for this are manifold:

- The already high level of public debt does not allow any further risks to be assumed or legal hurdles such as the German “debt brake” to be overcome.
- The complexity of the risk assessment is outside the government’s expertise.
- State intervention could lead to market distortions and therefore to inefficacy and unfairness.

These statements can be summarised under the motto: “It is not the job of a government to be a risk carrier for the high-risk investments of others.” However, this does not take into account the fact that **society and governments are the main beneficiaries of green investments**. While some investments do involve risk, **government budgets as a whole will benefit from participating in green finance**. Several central government areas would be positively impacted if state players were to step in as guarantors.

1. As a result of a lack of investment, European industry has fallen behind the international competition in many technologies – whether green or not. Significant market interventions by the US (IRA, CHIPS Act...) and Chinese (e.g. “Made in China 2025”) governments are already leading to advantages over European companies. Helping European companies by guaranteeing their investments creates a level playing field, strengthens domestic industry and increases tax revenues. Deloitte predicts that the global economy will grow by USD 43tn from 2021 to 2070 due to the green transition alone, which underlines the enormous return potential.²⁴ In addition, promoting investment is a less provocative strategy than punitive tariffs.
2. One of the EU’s core objectives is to reduce emissions by at least 55% by 2030 compared with 1990 and to become climate-neu-

²⁴ Deloitte, Financing the Green Transition – a US\$50 trillion catch, November 2023 [\[Link\]](#)

tral by 2050.²⁵ As there have arguably been few other notable ambitions that have been actively pursued in the last decade, this is a target that most Europeans and their governments can rally behind. Therefore, promoting climate investments should be of paramount importance for all governments striving for a united Europe.

3. Social tensions are evident throughout the EU. This was clearly reflected in the European elections in 2024: Political forces advocating a conservative spending policy are growing stronger. Most EU governments are resorting to direct investment as the most important financing instrument. This is causing resentment amongst a large section of the population because they would like to see the money invested in direct national problems. One approach that takes account of this discontentment would be a reasonable assumption of risk by the state. It would only bear the risk. The capital would come from other sources.
4. Green investments are often high and for long periods of time. However, they are primarily needed to provide impetus for the transition to low-carbon production. Governments can assume that the energy transition will be more of a one-off than a permanent investment endeavour. As soon as industry has been restructured, government budgets will no longer only have risk on their balance sheets, but rather have achieved returns.
5. The financial policy instruments that can be used for the energy transition can be used in a similar way for investments in the urgently needed expansion of a European defence industry.

The role of governments in taking on risk for green investments has a significant impact on the capital markets and financial institutions, especially banks. When governments step in to provide guarantees or risk participation mechanisms for green projects, this can fundamentally change the risk-return profile of these investments. This government support can lead to a reduction in the risk-weighted assets associated with the green financing of banks. In this way, it can free up capital that can be used for additional sustainable projects. If, for example, a government guarantee reduces the risk weight of a green loan from 100% to 50%, a bank can double its green lending capacity without increasing its capital needs. Such a shift can double the injection of private capital into the net zero transition, as financing sustainable projects is then a more attractive proposition for banks and other financial institutions.

25 European Commission, Delivering the European Green Deal, 14 July 2021 [\[Link\]](#)

India, for instance, successfully uses blended finance to mobilise private capital for achieving its climate goals. Blended finance includes the strategic use of low-interest funds from donors, governments or third parties, combined with standard financing from development banks and commercial investments. This approach supports private sector growth, contributes to achieving sustainable development targets and promotes the mobilisation of private re-



sources.²⁶

The capital market can be structured in a more layered way than is the case today. Asset managers need investable and scalable securities, as they invest in the debt-to-equity ratio of projects from the outset. If, for example, the state were to raise equity capital of 20% for energy transition projects with the help of its promotional or investment banks, this would mobilise further capital donors. This capital can be provided by specialised companies who have a high level of expertise in financing solar parks, power lines, electrolyzers, etc.

In addition, the risk landscape for green as opposed to brown investments would turn around over time. As green technologies and the projects realised with them mature, their risk profile will decrease. This maturing process, coupled with increasing political support and market demand for sustainable solutions, will lead to stable and more predictable returns on green investments. Conversely, brown investments are exposed to increasing risks due to expected regulatory changes, changing consumer preferences and the physical effects of climate change. Assets that do not take into account the effects of climate change will be lost, leading to significant write-downs and losses. This divergence in risk trends indicates that the risk-adjusted returns on green investments will become more and more favourable in terms of refinancing over time compared with their brown counterparts.

The urgency for governments to act as risk carriers for green financing cannot be emphasised enough. By intervening, they are not only accelerating the transition to a sustainable economy. They also unlock considerable economic potential, promote innovation and tackle urgent social challenges. The evolving risk landscape favours pioneers, with green investments becoming increasingly attractive as they mature. Therefore, the European governments must recognise their unique position to act as a catalyst for change and seize this opportunity to secure a competitive, sustainable and united future for the EU.

26 IFC, Blended Finance for Climate Investments in India, 2023 [\[Link\]](#)

One of the experts we interviewed for this study used a handy hypothetical example to illustrate the potential of a unified European capital market and risk-sharing by European states in the energy transition:

“Germany and the Netherlands have high savings rates and low unemployment. Spain and Greece have low savings rates and high unemployment. However, Spain and Greece have plenty of sunshine and private households are still heated with gas. Why should capital not flow from Germany and the Netherlands to Greece and Spain to install solar production and storage systems there on an unprecedented scale? This could trigger the need for tens of thousands of installers and electricians in one fell swoop, thereby noticeably alleviating the problem of unemployment and making a huge and measurable contribution to reducing carbon emissions within a reasonable period of time. Such measures would truly be European solidarity in action!”

– Dr Florian Herzog, Founder & Chairman Deon Digital

APPROACHES OF FOREIGN MARKETS

The European model is the focus of this study and has already been discussed. It is also worth outlining the approaches of foreign markets. This provides European decision-makers with insights and ideas to consider when analysing possible future paths.

The United States

The strong capital markets in the USA were extremely effective in mobilising capital in the past. However, this effectiveness also comes with trade-offs. At the end of the 90s, for example, enormous amounts of capital were poured into internet companies and start-ups. This turned out to be a key area for the future. However, the resulting dotcom bubble led to a huge crash. Although this crash temporarily damaged the economy, the USA remains a leader in this sector. This example is emblematic of the US model. Its depth, breadth and variety of funding sources are undoubtedly a global strength, although it also has disadvantages that need to be ironed out.

The duality of the US model is omnipresent if you look at climate change financing. In 2023, the USA invested USD 303bn in the energy transition, putting it in second place among individual countries, but third behind the EU 27.²⁷ The USA was the leader in venture capital and private equity financing and secondary placements, way ahead of China and the EU.²⁸ This reflects the range of financing sources. A key aspect of the US model is the relatively minor role played by banks in corporate finance compared to Europe. Although banks are still important players, in particular for small and medium-sized companies, larger corporates tend to more often conduct refinancing activities via the capital market. In the USA, companies mainly raise funds via equity and credit markets instead of relying heavily on bank loans.

The growth of the asset management industry began in the 1980s.²⁹ This model is driven by the diverse and large pool of institutional and private investors in the USA who are willing to invest in a wide range of securities. The presence of large institutional investors such as investment funds, pension funds and hedge funds further contributes to the liquidity and efficiency of the markets and offers investors stability and confidence.

²⁷ BloombergNEF, Energy Transition Investment Trends 2024

²⁸ *ibid.*

²⁹ Ben-David, I., Developments in the Asset Management Industry, The Reporter, 1 July 2017 [[Link](#)]

The US model also benefits from a highly liquid secondary market, which enables efficient pricing and transfer of risk. This liquidity is supported by a wide range of market players, including private investors, investment funds, pension funds and hedge funds. The prevalence of 401(k) pension plans and the cultural emphasis on investing in the stock market have created a large pool of private investors and developed the market further.

The USA has been the leader in developing new financial instruments, from mortgage-backed securities to exchange-traded funds (ETFs) and complex derivatives. While these innovations have sometimes led to excesses and crises (as in 2008), they have also enabled more efficient risk management and more effective capital allocation. The flexibility and adaptability of the model have enabled it to evolve with changing economic conditions and technological advances and maintain its position as the world's leading financial market.

Despite the larger size and effectiveness of the US capital market, it still lags behind the EU in terms of green investment. This lays bare both the limitations of the broader US system and the complexity of financing the green transition. While the US model stands out in terms of mobilising capital and fostering innovation, the leading role of the EU in green investment underlines the importance of political frameworks, regulatory environments and societal priorities in promoting sustainable finance.

China

In 2023, China invested around USD 675bn in clean energy, which reflects a rise of +36% on the previous year. This represents 13% of its entire fixed-asset investments, compared with 9% in 2022.³⁰ These investments in clean energy contributed to approximately 40% of China's GDP growth.³¹ The “new three” sectors – solar energy, electric vehicles (EVs) and energy storage – dominated these investments. Solar energy saw significant growth in both generation capacity and production infrastructure. This rapid expansion underlines China's commitment to reducing CO2 emissions and its ambition to be a global leader in these sectors.

China's green finance strategy is strongly supported by government policies aimed at “dual CO2 targets”, namely limiting carbon emissions by 2030 and achieving carbon neutrality by 2060.

30 BloombergNEF, Energy Transition Investment Trends 2024

31 Carbon Brief, Analysis: Clean energy was top driver of China's economic growth in 2023, 25 January 2024 [\[Link\]](#)



Incentives and regulatory frameworks have mobilised both public and private capital for green projects, driving economic growth and restructuring China's industrial landscape.³² Despite this progress, Bloomberg points out that China will need to raise USD 1.6tn annually for investments in clean energy by 2030, 2.4 times the investment in 2023.³³

Public markets and venture capital play a limited role in financing new technologies in China. Venture capital investments amount to only 1% of GDP, compared with 2% in the EU, 7% in the US and 6% in the UK.³⁴ Government mechanisms, including fiscal and tax incentives, primarily fund these technologies. State-owned companies benefit considerably from these measures and favour equity financing due to lower costs and tax benefits.

Non-state-owned companies are more heavily reliant on market-based finance and take greater financial risks. Consequently, they generally have a higher risk tolerance and prioritise the economic benefits of external funding over the costs associated with external financing. Therefore, non-state-owned companies are frequently reliant on external financing methods such as bank loans to fund their research and development activities.³⁵

China's green finance policy has had a mixed impact on technological innovation. While heavily polluting enterprises have been deterred from technological innovation due to pessimism about the returns, digital financing has had a positive effect on technological innovation in the energy sector.³⁶ Digital finance has complemented traditional financial markets by addressing problems with "difficult and expensive financing" and encouraging risk-taking behaviour.³⁷ Traditional financial markets have, however, often marginalised non-state-owned small and medium-sized enterprises (SMEs) because these companies are more dependent on internal funding for innovation, especially in the energy sector.³⁸

32 Green Finance & Development Center, FISF Fudan University, Nedopil, C, Song, Z., China Green Finance Status and Trends 2022-23, January 2023 [\[Link\]](#)

33 BloombergNEF, Energy Transition Investment Trends 2024

34 European Investment Bank, Investment Report 2023/2024 [\[Link\]](#)

35 Han, H., Gu, X., Linkage Between Inclusive Digital Finance and High-Tech Enterprise Innovation Performance: Role of Debt and Equity Financing, *Frontiers in Psychology*, 28 December 2021 [\[Link\]](#)

36 Wang, B., Wang, C., Green Finance and Technological Innovation in Heavily Polluting Enterprises: Evidence from China, 14 February 2023 [\[Link\]](#)

37 Guo, Z., Peng, Y., Chen, Y., How Digital Finance Affects the Continuous Technological Innovation of Chinese Energy Companies?, *Frontiers in Energy Research*, 16 March 2022 [\[Link\]](#)

38 *ibid.*



THE SCENARIOS

Scenario analysis is a strategic foresight method used to determine future prospects by examining alternative possible outcomes. In this analysis, we apply the traditional 2x2 scenario method, which identifies two critical uncertainties in order to create four possible outcomes.

In our analysis of possible futures for the European capital market, we consider on the one hand the **unity or fragmentation of the EU capital market** and, on the other hand, **the proportion of bank financing** for the energy transition.

By combining the extreme ends of these uncertainties, we generate four different scenarios covering the range of possible future scenarios. This approach enables us to analyse the consequences of different outcomes and provide a structured framework for strategic decisions. Whilst the actual future probably lies within the spectrum and does not perfectly match a single scenario, this method provides valuable insights into potential challenges and opportunities that may arise under different circumstances.

Basic assumptions

In our scenario analysis, we have made several key assumptions to create a framework for understanding possible future prospects for the European capital markets in the context of the climate transition. **In all the scenarios, we assume that the financing targets for the energy transition will be achieved**, so that we can concentrate on **the requirements for the success of the scenario**.

Our calculations are based on the Bloomberg New Energy Finance (BNEF) targets. The EU share of global climate investments is set at 25%, which gives it more responsibility than at present (20% in 2023). We assume a distribution of green financing sources where 65% comes from bank financing,³⁹ 30% from asset managers⁴⁰ and 5% from government financing such as grants and subsidies. In this case, the asset management sector mentioned covers all other non-bank investors, such as private equity companies, pension funds, sovereign wealth funds, insurance companies and venture capital.

39 Climate Policy Initiative, Global Landscape of Climate Finance 2023, November 2023

[\[Link\]](#)

40 Truchet, M. Eurofi Regulatory Update, April 2023 [\[Link\]](#)

For the balance sheet calculations, we assume that the current (2024) total assets of EU banks are USD 31.9tn⁴¹, 15% of which in the form of energy assets, subject to an annual decrease of 5%. We track the ratio of green to brown investments, starting at 0.73 and moving towards BNEF target ratios of 4 (2024–30), 6 (2031–40) and 10 (2041–50). A key assumption is that each scenario significantly impacts the ratio of financing by banks, asset managers and governments in green energy investments. Our calculations extend over three decades and are based on the BNEF framework. We assume different changes under different scenarios. These are described in detail.

To improve visual clarity, the charts are smoothed by converting the annual BNEF amounts (see Fig. 2) into a degressive chart. However, there is still a significant jump between 2023 and 2024 due to the steep 174% increase in Bloomberg's target figures by 2024. **We should stress that these charts do not represent forecasts**, but should rather be understood as possible future scenarios. The presented charts and figures illustrate the operational framework that banks and asset managers may be confronted with if these scenarios materialise. They serve as a tool for strategic thinking, not as a prediction.

Scenario axes

The scenarios in this study are based on two axes that represent the critical uncertainties in the future of the European capital markets. These axes capture key variables that will influence the structure and dynamics of net-zero financing in Europe in the coming decades.

The x-axis contrasts a low share of bank financing with a high share of bank financing in relation to financing by asset managers. This uncertainty captures the evolving role of traditional banks versus asset managers in financing the energy transition. It analyses how long banks will hold assets on their balance sheets and to what extent alternative financing methods, in particular via asset managers, will gain in importance. This axis reflects the ongoing debate over the optimum structure of capital markets to ensure an effective and efficient flow of capital towards green investments.

The y-axis contrasts an active, unified EU capital market with the image of conservative, fragmented national capital markets in the EU. This dimension takes into account the level of integration and harmonisation of the European capital markets as well as the extent of state intervention in shaping the mar-

⁴¹ BloombergNEF

ket framework. At one end of the spectrum, we envision a scenario where a robust capital markets union is achieved in addition to pro-active measures at EU level to facilitate climate financing. On the other end, we envisage a future where national vested interests continue to dominate. A highly fragmented and less dynamic capital market landscape, as it exists in the EU today, will be maintained. Individual political forces can belong to any current or future political camp. What unites them is a reluctance or outright rejection of developing the EU into a more centralised entity. The y axis captures the tension between the drive for greater European financial integration and the persistent forces for national economic sovereignty.





Scenario 1: The Great Reform

Basic assumptions:

- 25% of investments are made via the EU capital market.
- In 2023, banks made 65%, asset managers 30%, and governments 5% of net zero-relevant investments.
- 15% of bank assets are related to the energy sector.
- Repayment reduces the energy assets by 5% p.a.
- The starting point is the Bloomberg net zero scenario figures.

Scenario-specific assumptions:

Annual change in the shares in investment by the capital market players:

- 2024-2030: Banks -3%, asset managers +2%, governments +1%
- 2031-2040: Banks -1.75%, asset managers +2%, governments +0.25%
- 2041-2045: Banks -0.75%, asset managers +1%, governments +0.25%

In 2045, the European Union is a global leader in financial innovation and net zero investments. The successful implementation of the capital markets union has changed the economic landscape of Europe and created a seamless, integrated financial market spanning the whole continent. This radical transformation took place as part of a wider package of reforms that centralised significant power within the EU, reshaping not only financial policy, but also economic and defence strategies. The core logic of this scenario lies in the power of unity and reform. It shows how concerted action and bold policy decisions can revitalise an entire continent's approach to finance and sustainability.

The path to this future was paved by several key events and trends. The completion of the capital markets union in 2025 was a turning point that broke down long-standing barriers between national financial markets. This was accompanied by an increase in cross-border investments, as companies and investors found new opportunities outside their national borders. The banking sector underwent a transformation and switched to a more dynamic model for financing green projects. In the meantime, asset managers experienced strong growth and became the strongest cornerstone of long-term green investment.

Total EU Green Energy Investment

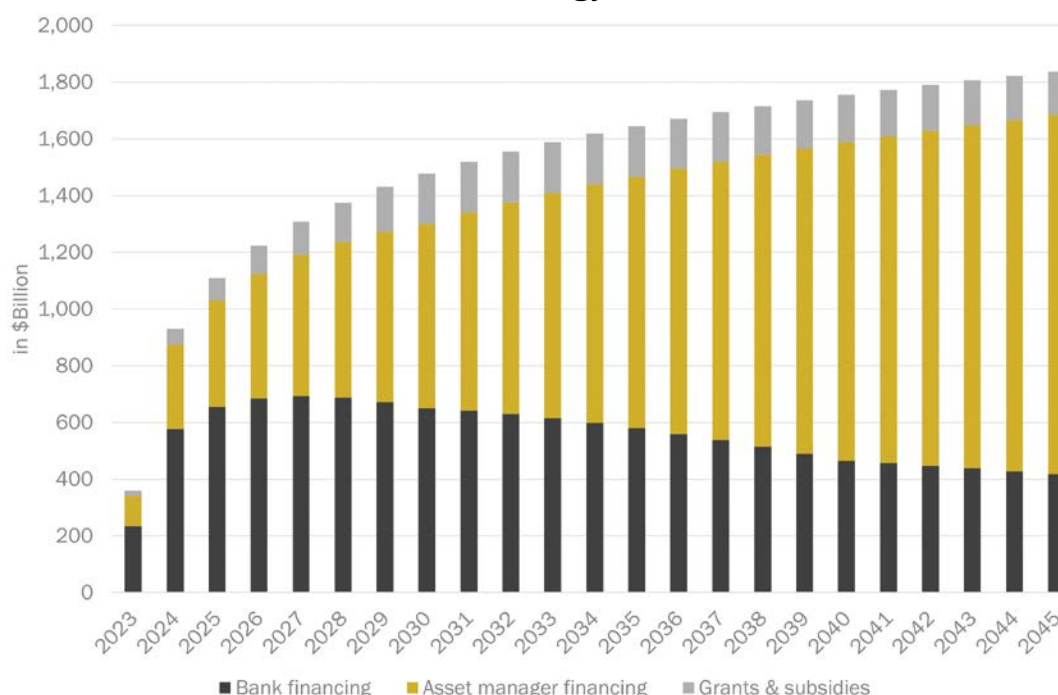


Fig. 6: Scenario 1. The chart reflects the change where incentivised asset managers are investing more heavily in the energy transition. By the end of this decade, they will reach the same asset volume as banks in the capital market. Governments promote investments and become more active in the first few years in order to sell their investments to other players later on, as a result of which the government share will shrink again by 2045.

Banking Energy Investments & Total Assets EU Banks

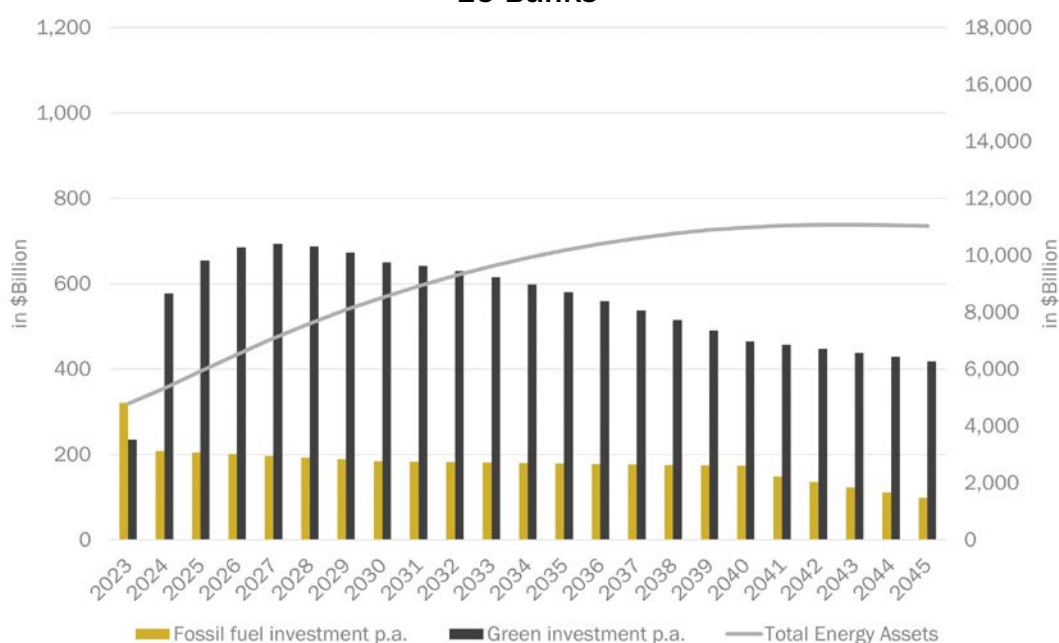


Fig. 7: While the banking sector still has to grow significantly in the first four years, its share of the capital market will peak in the mid-2030s due to the increasing proportion of asset managers. In this scenario, the total energy investments of EU banks must increase by 130%.



In this scenario, the roles of financial institutions have evolved significantly. Banks have become agile facilitators for green projects, focusing more on financing the construction phase and the quick sale of assets after financing. This shift has enabled them to maintain leaner balance sheets while increasing their overall project throughput.

The asset management sector has grown considerably to become the major long-term holder of green assets, channelling unprecedented amounts of capital into sustainable initiatives. Governments, both at the national and EU level, have taken on a more active role in shaping markets, promoting public-private partnerships and harmonising regulations to create a truly unified financial ecosystem.

In this scenario, financial institutions are operating with a new-found dynamism. Banking regulators have backed net zero assets with a lower capital charge, which is why they are performing better than traditional assets. The banking sector in the EU has grown and become more profitable. It is focusing on transaction volumes and rapid settlement rather than safer long-term asset management.

Asset managers have become experienced players in green finance and have developed expertise in valuing and managing long-term sustainable investments. The line between traditional banking and asset management has become blurred, as many institutions offer hybrid services in order to meet the diverse demands of the green economy.

This scenario achieves its ambitious climate goals through a multi-pronged approach. The more efficient allocation of capital facilitated by the capital markets union enables the faster provision of funds for green projects. At the same time, the robust asset management sector ensures a steady inflow of long-term capital to maintain and expand these initiatives. Public-private partnerships have become a key innovation driver, especially for nascent green technologies that might be too risky for traditional financing models.

For this scenario to become a reality, several crucial elements need to come together. The political will for a deep integration must overcome nationalist or otherwise (small c) conservative tendencies. A shared vision of a green, prosperous Europe must motivate public support in all member states. The financial sector must be willing to accept significant structural changes, while the regulatory framework must evolve to support this new model at the same time as maintaining stability.

Early indicators and signposts to look out for include gradual progress with financial integration, such as harmonising the tax treatment of financial products across EU countries. Important political indicators would be the success of unionist forces, the rise of supranational parties, growing support for an EU army and the introduction of euro bonds. An increase in cross-border green investments and the growth of pan-European asset managers would also signal a development in the direction of this scenario.

A common European industrial policy which, alongside the energy transition, promotes industries that produce in a climate-neutral way and operate globally, and an increase in public-private partnerships for the net zero transformation of the economy, would be key indicators. In addition, changes in banking activities that reflect more dynamic project financing and a more dynamic asset turnover, as well as the consolidation of banks across national borders, would support the development of this scenario.



2

Scenario 2: Capital Market of Two Speeds

Basic assumptions:

- 25% of investments are made via the EU capital market.
- In 2023, banks made 65%, asset managers 30%, and governments 5% of net zero-relevant investments.
- 15% of bank assets are related to the energy sector.
- Repayment reduces the energy assets by 5% p.a.
- The starting point is the Bloomberg net zero scenario figures.

Annual change in the shares in investment by the capital market players:

- 2024-2030: Banks -1%, asset managers +0%, governments +1%
- 2031-2040: Banks -1.5%, asset managers +1%, governments +0.5%
- 2041-2045: Banks -1.5%, asset managers +1%, governments +0.5%

In 2045, the European Union presents a unique, two-tier landscape of financial integration and net zero innovation. The core logic of this scenario revolves around a cautious but progressive approach to financial reform and sustainable development. A capital markets union has been established, but it only comprises a willing core of EU members. As a result, a pioneer group is created that takes the lead in financial integration, while others follow at a more moderate pace. This two-tier system reflects a compromise between the goal of a single market and the political realities of the different preferences of the member states.

The partial implementation of the capital markets union was an important milestone that enabled a group of countries to deepen their financial relationships and harmonise the regulations. At the same time, the banking sector continued its conservative approach to green finance, prioritising the long-term holding and stability of assets over a quick turnover. This shift was accompanied by comprehensive policies that support mature green technologies and drive steady but cautious progress in sustainable development.

Total EU Green Energy Investment

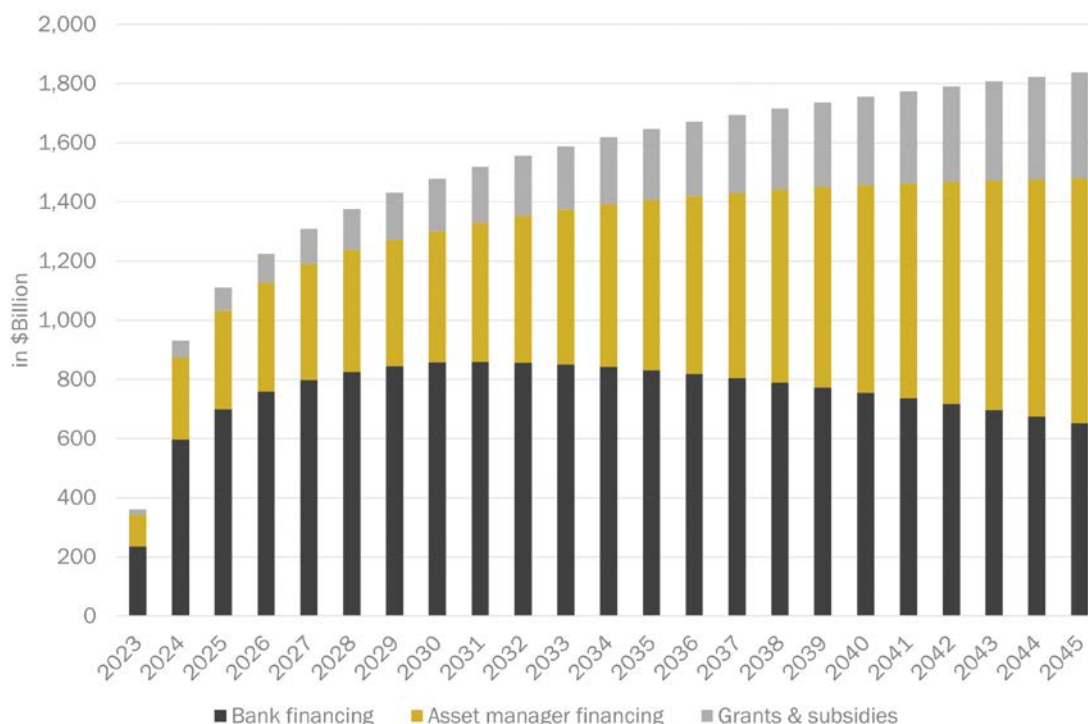


Fig. 8: Scenario 2: As in the other scenario made possible by the capital markets union, EU governments are using their influence to take risks when investing in the energy transition. However, unlike in Scenario 1, the proportion of state subsidies is still increasing after the first decade, albeit at a slower rate. This is due to the slower implementation of the capital markets union, membership of which is voluntary. A correspondingly cautious approach is taken by the asset management industry, which only starts to invest significantly more after 2030, when more and more countries join the capital markets union.

Banking Energy Investments & Total Assets EU Banks

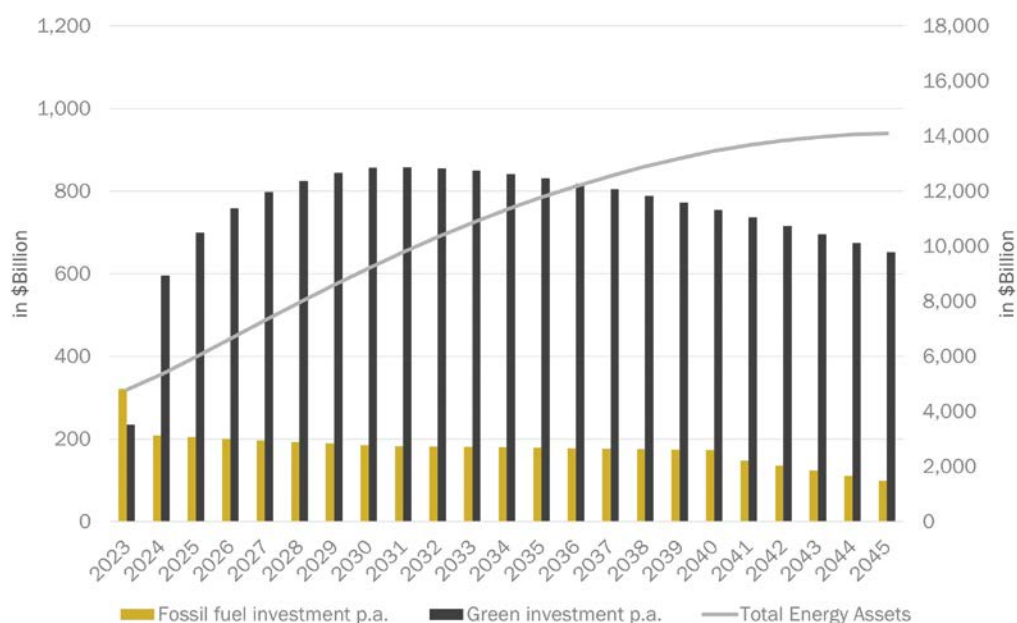


Fig. 9: In this scenario, the banking sector remains the strongest player on the capital market until 2040. Asset managers do not catch up until then. **In this scenario, the total energy assets of EU banks would have to increase by 195%.**

In this scenario, banks play a key role as long-term holders of green assets and concentrate on maintaining stability during the operational phase of projects. This traditional approach has implications for the pace of green innovation but represents a solid base for sustainable finance. The asset management industry still plays a significant role, but it is a more subordinate role compared with banks. It frequently cooperates with them to provide special expertise for managing long-term green investments.

Governments, particularly the pioneers in the EU, play an active role in shaping a harmonised regulatory environment that ensures consistency and reliability for green finance investments. They take long-term financial risks and use their promotional and investment banks to mobilise capital for the energy transition.

In this scenario, financial institutions operate with a focus on stability and long-term value creation. Banks are well-versed in managing green assets throughout their life cycle and develop sophisticated risk assessment models for long-term sustainable projects. They work closely with project developers and operators and frequently take an active role in ensuring the success of green initiatives. Asset managers have specialised in developing products that are in line with this long-term, low-risk approach and are aimed at investors seeking stable returns on mature green technologies.

This scenario achieves its climate goals through a well-orchestrated, multi-layered approach. The steady, reliable flow of capital into established green technologies ensures steady progress towards achieving sustainability targets. The initial pace may be slower compared with more aggressive scenarios, but the stability of the investments and the focus on tried-and-trusted technologies lead to a high success rate for green projects. The harmonised regulations in the EU's pioneering economies create a favourable environment for cross-border green investments and enable capital allocation to the most promising mature technologies.

For this scenario to actually materialise, a political consensus needs to be reached on the advantages of a two-tier system with clear pathways to integrate those countries lagging behind. The culture of valuing stability and long-term thinking in finance must be maintained across the EU. The technological progress in established green sectors must continue in order to prove the viability of a cautious investment approach. In addition, robust mechanisms for knowledge sharing and technology transfer between the pioneers and those countries lagging behind must be created to ensure coherent progress towards achieving climate targets.

Signs that this scenario will be the future of the EU capital market include the formation of a coalition of EU countries who implement strong integration of their capital markets and a continued stance by major European banks to prioritise long-term green assets. Key indicators would be policy proposals that emphasise financial stability and support for mature green technologies. Finally, visible differences in the pace of the introduction of green finance between the individual EU member states would indicate the development of the two-tier system that characterises this scenario.

Scenario 3: Competing National Clusters

3

Basic assumptions:

- 25% of investments are made via the EU capital market.
- In 2023, banks made 65%, asset managers 30%, and governments 5% of net zero-relevant investments.
- 15% of bank assets are related to the energy sector.
- Repayment reduces the energy assets by 5% p.a.
- The starting point is the Bloomberg net zero scenario figures.

Scenario-specific assumptions:

Annual change in the shares in investment by the capital market players:

- 2024-2030: Banks -2.5%, asset managers +2%, governments +0.5%
- 2031-2040: Banks -1.25%, asset managers +1%, governments +0.25%
- 2041-2045: no change in shares

In 2045, the financial landscape of the European Union is characterised by regional disparities and competing interests. The core logic of this scenario revolves around a fragmented market where the lack of a unified capital markets union has led to a mishmash of green financial policies and investment practices across member states. This fragmentation has resulted in different clusters of financial activity, each with its own approach to sustainable development and economic growth.

This future has been shaped by the following important events: After a strong push for a capital markets union, this was ultimately rejected. This failure to create a capital markets union marked a turning point that led to a strengthening of regional financial centres with varying progressive regulatory frameworks for net zero investments. The decision to favour national autonomy over a centralised fiscal policy was a critical turning point that allowed for different approaches to green finance but hindered overall market integration. Some regions embraced cutting-edge sustainable technologies, attracting significant investment and fuelling local economic booms. By contrast, other countries pursued more conservative approaches, leading to a slower pace of energy transition. This disparity resulted in a competitive environment where different clusters not only competed with each other, but also formed alliances with power blocks outside the EU.

Total EU Green Energy Investment

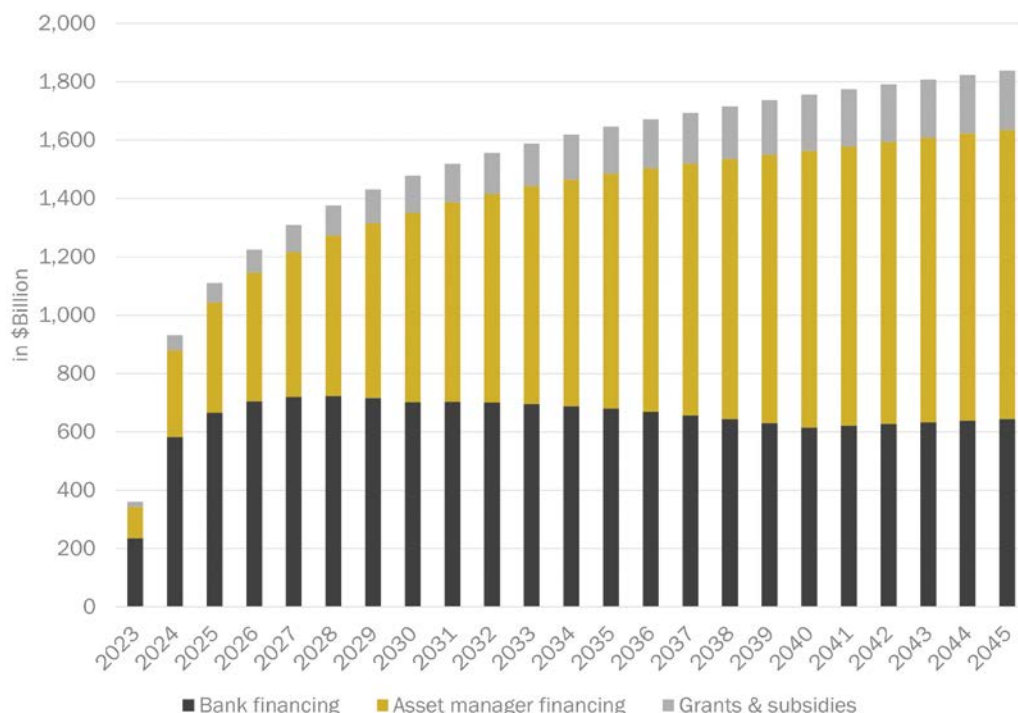


Fig. 10: Scenario 3 is characterised by early shifts in investor equilibrium. The more competitive environment leads to early disruptions and more capital flows across different clusters. This is illustrated by a comparatively rapid decline in the share of bank financing. Following the initial reorganisation and creation of a new balance of power, there are only a few changes in the structure in 2040.

Banking Energy Investments & Total Assets EU Banks

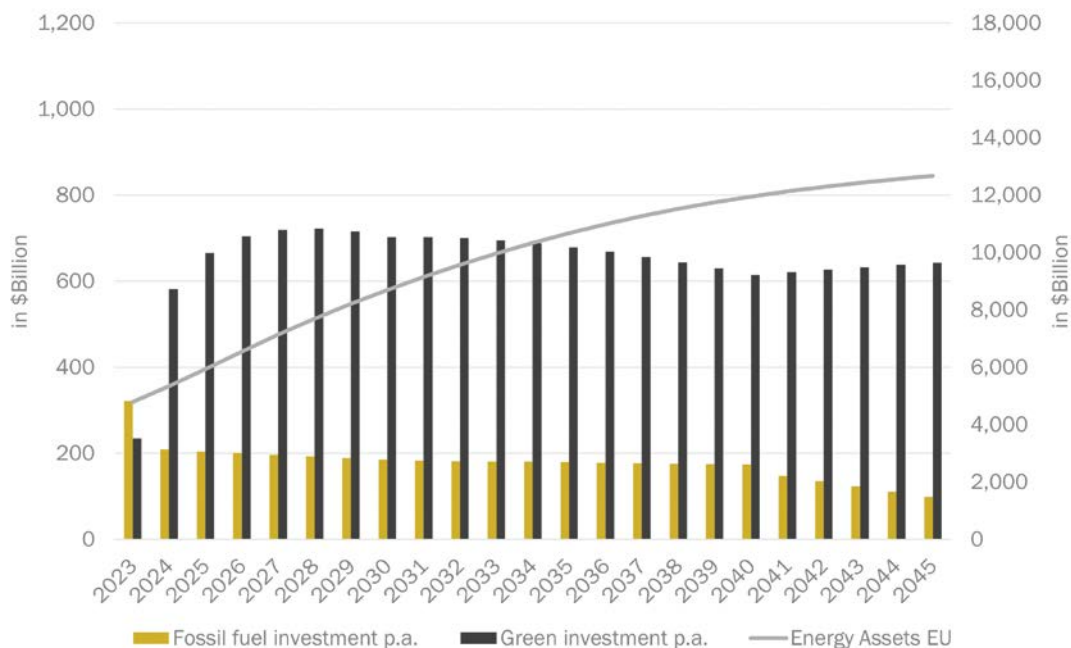


Fig. 11: The role of the banks is not as important as in other scenarios. Competition is tougher anyway, as more external players enter the market. **In this scenario, the total energy assets of EU banks would have to increase by 165%.**

Banks have adapted to the fragmented landscape by becoming more agile and aggressive in their approach to green finance. They are focusing on rapid asset turnover and financing projects quickly, before selling them to maintain liquidity and to exploit regional opportunities.

The asset management industry has flourished in this environment. It grew significantly in national markets to cover the demand for specialised investment products tailored to the different green financial landscapes in the EU. Governments play a rather limited role in shaping their regional financial ecosystems. Some are promoting progressive green financial centres, while others are taking a more conservative approach.

Financial institutions operate with a high degree of adaptability in this scenario. Banks have developed sophisticated systems to assess and capitalise on regional differences in green finance policy. They often specialise in certain regions or types of green technologies. They are becoming experts in navigating the complex array of regulations and market conditions across the EU. Asset managers have become adept at creating diverse portfolios that utilise the strengths of different regional clusters and offer investors a range of options – from risky but lucrative GreenTech investments to more stable, conservative green finance products.

This scenario achieves its climate goals through a combination of targeted mechanisms and the power of competitive innovation. While overall progress may be patchy, the ability of individual countries and regions to harness their unique strengths enables significant progress in specific areas of green technology and finance. The competitive landscape drives innovation. Successful models in one cluster are often adopted and improved in another. In addition, dynamic capital markets enable a faster inflow of external investment into promising green projects across the EU.

For this scenario to materialise, the political forces advocating regional autonomy must remain strong and prevent the formation of a unified capital markets union. Economies must embrace diversity and competition in financial approaches. Technological progress must continue at different speeds in different regions to prove the feasibility of multiple paths to green innovation. In addition, robust mechanisms for interregional cooperation and knowledge sharing need to be created to ensure that the advantages of local successes can be shared across the EU. Bilateral agreements between EU member states that guarantee both banks' and asset managers' security when investing in another country are also conceivable.

The increasing strength of different regional financial centres specialising in different aspects of green finance will be an indicator that this scenario could

become a reality. An increase in cross-border partnerships between EU regions and external power blocks would signal alignment with this scenario. Political proposals that emphasise regional autonomy in financial regulation and the development of green technologies would be other important indicators. The ascendancy of specialist banks and asset managers focusing on specific regions or green technologies would also point to a movement towards this vision of the future. Finally, visible differences in the speed and direction of the introduction of green finance between different EU regions, coupled with a growing interregional competition and cooperation trend, would indicate the development of the competing clusters that characterise this scenario.



4

Scenario 4: Triumph of Realpolitik**Basic assumptions:**

- 25% of investments are made via the EU capital market.
- In 2023, banks made 65%, asset managers 30%, and governments 5% of net zero-relevant investments.
- 15% of bank assets are related to the energy sector.
- Repayment reduces the energy assets by 5% p.a.
- The starting point is the Bloomberg net zero scenario figures.

Scenario-specific assumptions:**Annual change in the shares in investment by the capital market players:**

- 2024-2030: Banks -0.5%, asset managers -0.5%, governments +1%
- 2031-2040: Banks -0.25%, asset managers -0.25%, governments +0.5%
- 2041-2045: Banks -0.25%, asset managers -0.25%, governments +0.5%

In 2045, the financial landscape of the European Union is a testament to the continued power of national interests and conservative economic policies. The core logic of this scenario revolves around a fragmented market where the lack of a unified regulatory framework has led to a mishmash of conservative legislation that significantly hampers the growth of green finance across the continent. This fragmentation reflects a triumph of realpolitik over idealistic visions of European integration and leads to a risk-averse approach to sustainable development.

The failure to create a comprehensive capital markets union marked a critical turning point and cemented the fragmentation of the financial markets across the EU. Nationalistic policies gained traction, supporting the growth of regional industries and financial institutions at the expense of pan-European initiatives. This shift was accompanied by a strong emphasis on financial stability, with policy makers consistently prioritising risk mitigation over aggressive green finance initiatives.

Total EU Green Energy Investment

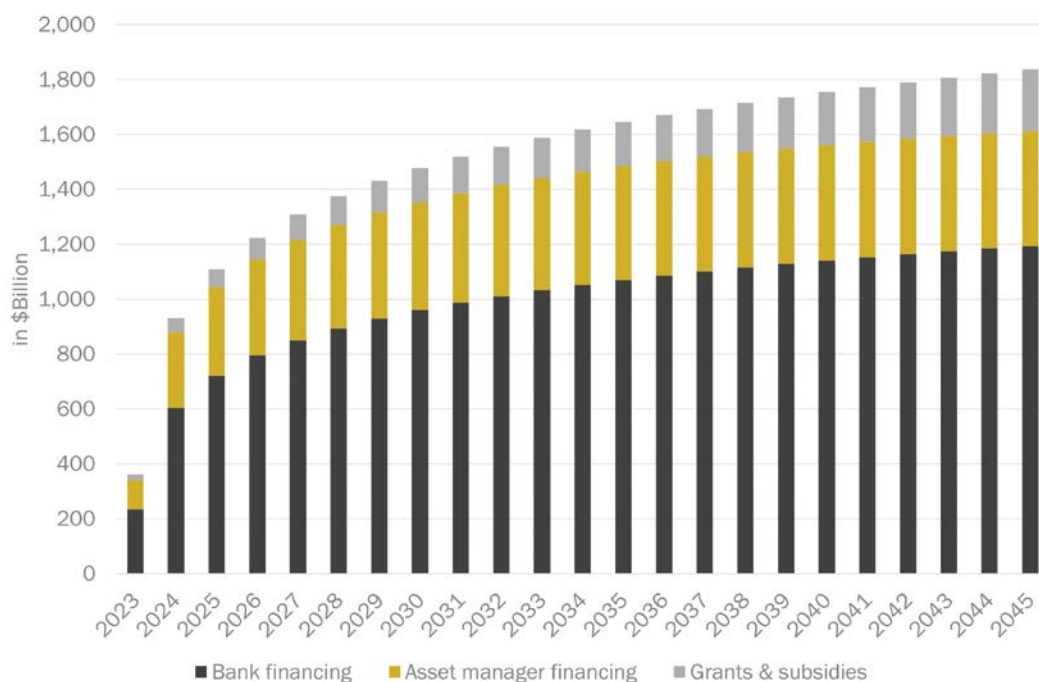


Fig. 12: Scenario 4: The capital market shares of all participants in this scenario are the most rigid. While the EU and the member states invest more to begin with, neither banks nor asset managers expand beyond their original share. The latter even lose shares in this scenario

Banking Energy Investments & Total Assets EU Banks

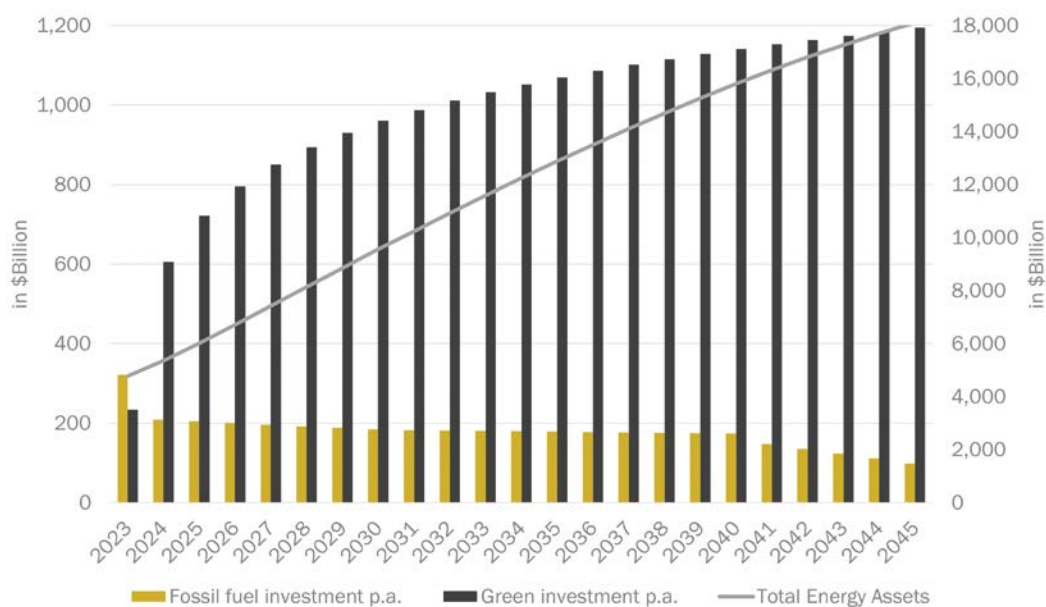


Fig. 13: Financing the energy transition is shouldered to a large extent by the banks in this scenario. European banks would therefore have to increase their size by a breathtaking amount. **In this scenario, the total energy assets of EU banks would have to increase by 278%.**

Banks play a central, but cautious role in green finance. They have become experts at managing long-term, low-risk projects, especially those in the operational phase of green initiatives. This conservative approach has implications for the pace of green innovation. However, it ensures stable, albeit slow, progress towards sustainability targets. Asset managers play a relatively minor role, as they are often constrained by the limited supply of green investment opportunities and the fragmented regulatory landscape. Governments continue to exert a large amount of influence over their national financial sectors, implementing policies that prioritise regional economic interests and financial stability over rapid green transitions.

In this scenario, the financial institutions acting with great caution. Banks have developed sophisticated risk assessment models for long-term green products, focusing on mature technologies and established industries. They work closely with national regulators to ensure compliance with different regional standards. This often leads to a complex web of regulations for cross-border activities. Asset managers have adapted by creating conservative, nationally focused green investment products aimed at investors seeking stable, low-risk returns in the sustainable sector.

This scenario achieves its climate goals through a combination of strict compliance measures and increasingly severe penalties for non-observance of green standards. While overall progress is slow compared with more aggressive scenarios, the steady, risk-averse approach ensures a consistent, albeit gradual, shift towards sustainability. The focus on products in the operational phase and mature green technologies leads to a high success rate for funded initiatives, albeit with limited breakthroughs in groundbreaking sustainable innovations.

For this scenario to become a reality, several factors need to come together. Political forces advocating national sovereignty and economic conservatism must remain strong and prevent the formation of a unified European fiscal policy. Cultural values that prioritise stability and risk aversion in financial approaches must be maintained. Technological progress in green sectors must continue at a moderate pace, proving the viability of a cautious investment approach. In addition, robust national mechanisms to enforce green standards and penalties must be created to ensure progress towards climate targets despite the fragmented market. To ensure the necessary gigantic growth of the banking sector, initiatives are needed that either reduce the CET1 ratio of banks so as to have more capital available for energy transition projects, or the capital ratios of banks would need to be inflated through temporary public and private investments.



Observable signs of the realisation of such a scenario are the continued existence or strengthening of nationalistic economic policies in the EU member states. An increase in regionally orientated initiatives for green finance instead of pan-European projects would signal alignment with this scenario. Political proposals emphasising financial stability and risk mitigation in green investments would be key indicators. An increase in specialist banking products focusing on long-term, low-risk green projects within national borders would also suggest a move towards this vision of the future. Finally, growing differences in green finance regulations between EU countries, coupled with increasing difficulties in cross-border green investment, would indicate the development of the fragmented, conservative landscape that characterises this scenario.



WIDENING THE RANGE OF OPTIONS

If the scenarios developed above demonstrate one thing, it is the following: that in all four cases, the banking sector has no alternative but to grow massively over the next twenty years if it is to play a major role in investing in the energy transition. Even in a growth scenario that is still “modest” for the banking sector, albeit politically rather radical (scenario 1, The Great Reform), it would have to increase its volume of energy investments nearly two-and-a-half-fold by 143%. In the most politically most conservative scenario, the banking sector would have no choice but to increase its investments in the energy transition by 278% in a radical growth drive and almost quadruple in size. This can be achieved either through greater state involvement, even stronger regulatory frameworks than are currently in place or at the expense of neglecting other investments that are not primarily associated with the energy transition but are nevertheless necessary.

If we want to rule out the possibility that the goal of achieving the financing costs for a net zero transformation of the economy is watered down or even cancelled, then we need other opportunities to mobilise capital for the climate transition of the economy.

In the course of our research into alternative models for green finance today, we spoke repeatedly with Dr Delton Chen and Tim Malloch from Global Carbon Reward and Dr Florian Herzog and Dirk Sebald from Deon Digital. They made us aware of two interesting approaches that we would like to share with interested readers.

The Global Carbon Reward

The Global Carbon Reward (GCR) system of measures was first presented in 2017 by Delton Chen, Joël van der Beek and Jonathan Cloud as a market-based model for managing global CO₂ emissions. This system works as an outlier to the conventional capital market system by fundamentally rethinking the way carbon mitigation is incentivised and financed.

At its core, the GCR system is based on the principle of offering financial rewards rather than handing out penalties to companies that achieve quantifiable results in reducing and eliminating CO₂. This “carrot” approach is in sharp contrast to traditional “stick” methods such as carbon taxes and emissions trading schemes that impose costs on carbon emitters. The GCR system has a dual focus, in that it addresses both the social cost of CO₂ emissions and the systemic risks associated with climate change. It is also compatible

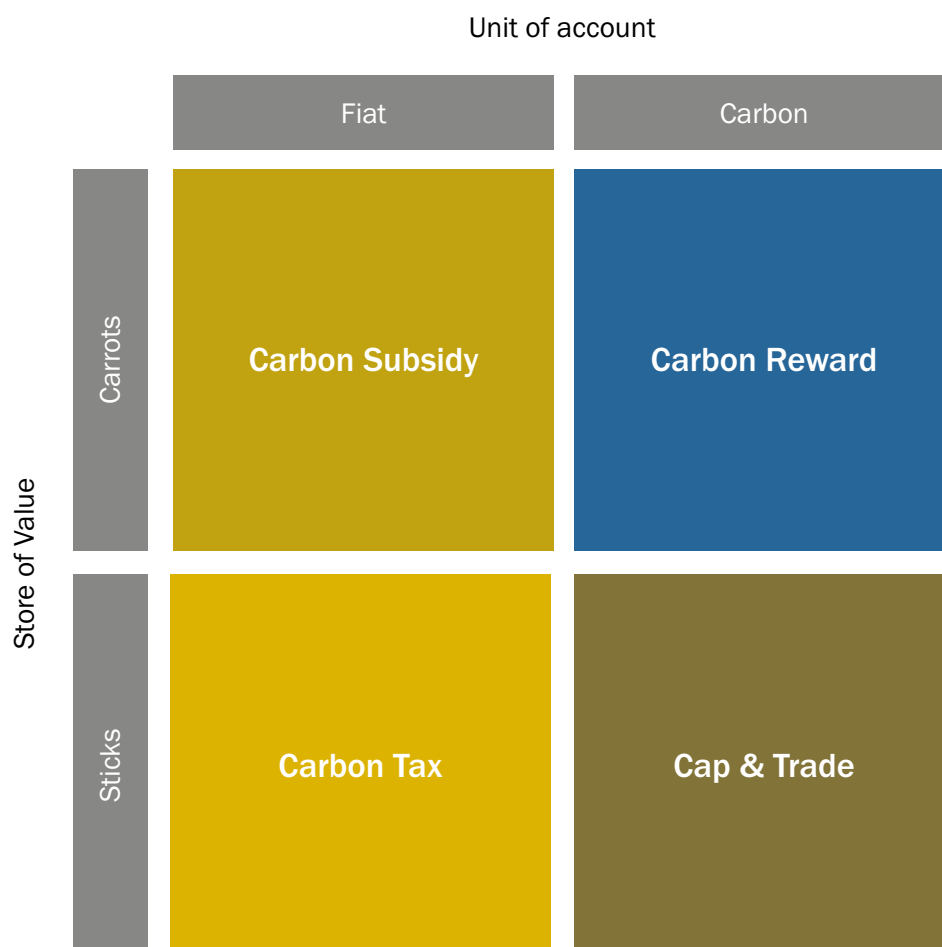
with different economic systems.

The main components of the GCR are:

- Tradable carbon assets - these assets are awarded to projects that demonstrably reduce or remove carbon dioxide (CO₂) from the atmosphere. Each carbon asset represents one ton of CO₂ saved for at least 100 years.
- Carbon Quantitative Easing (CQE) – Under CQE, central banks purchase carbon assets to maintain a stable floor price and ensure that the value of carbon mitigation remains attractive to investors and project developers. This is done by distributing a specially created currency, namely the “Carbon Currency”.
- Carbon Exchange Authority (CEA) – a special governing body, the CEA, oversees the issuance, trading and verification of carbon assets.
- Non-transferability of credits - carbon credits issued under the GCR system are non-transferable, i.e. they cannot be used to offset emissions elsewhere. This ensures that the credits contribute directly to net carbon reduction and prevents potential greenwashing.

Fig. 14: Graph based on Delton Chen’s “Carbon Pricing Matrix”, in which he relates the concept of carbon reward (top right) to other incentive and penalty systems.

More:
globalcarbonreward.org



The GCR system represents a significant shift in climate finance and offers a novel approach to promoting carbon reduction and removal. By utilising market mechanisms and the involvement of central banks, it creates a strong economic driver for climate action that goes beyond traditional punitive measures.

Primary energy suppliers, who today still generate the majority of their energy from burning fossil fuels, could, for example, be “paid” to leave coal, oil or gas in the ground. Instead, the money from CQE could be channelled into investments for the production of carbon-neutral energy. Freight transport on railway lines – as long as it is powered by green electricity – is extremely low-carbon compared to traditional diesel-powered lorries, which are used for the majority of intra-European freight transport. However, rail transport is currently usually more expensive than transport by lorry and is subsidised in many cases. By buying up carbon assets from rail transport, it would be easy to make it profitable and eliminate CO₂ emissions from combustion-powered road transport.

While policy makers and financial institutions struggle with the complexity of financing the green transition, the Global Carbon Reward model offers a compelling alternative that deserves serious consideration. Its potential to align economic incentives with environmental necessities could prove transformative in accelerating the pace of decarbonisation and mobilising capital on the scale required to achieve global climate targets. In this respect, the GCR system is evidence of the kind of innovative thinking needed to effectively address the climate crisis.





Bursa Carbon Exchange

Bursa Malaysia is the most important stock market in Malaysia and one of the largest stock exchanges across the ASEAN region. Since June of this year, the exchange has been trading in Renewable Energy Certificates (RECs). These are transparent certificates that enable high-emission industries to take practical measures to protect the climate. To this end, they use trading in emission credits from projects with measurable climate protection results that meet international standards.

To facilitate this trade, Bursa Malaysia established the Bursa Carbon Exchange (BCX) in 2022 as a subsidiary. The technology behind this highly complex certificate trading system comes from Europe, and more specifically from the Swiss company Deon Digital.

At the first auction on 25 June, 268,800 RECs generated at the Murum Hydroelectric Plant were sold to 15 local buyers. A further auction is planned for nature-based RECs generated in the Kuamut Rainforest Conservation Project. From the fourth quarter of 2024, the BXC aims to be able to offer RECs via continuous trading and facilitate over-the-counter transactions.⁴²

In the future, carbon exchanges will be an important instrument for monetarily rewarding CO2 reduction. In this context, applications range from the construction of solar parks to the conversion of public transport bus fleets from combustion engines to electric drives or the energy conversion of entire regions.

European stock exchanges should study and copy the example of Bursa Malaysia, before proceeding with a rollout of their own version on the European financial market. Mobilising funds through this trading will act as a catalyst for innovation and growth in a climate-neutral economy.

42 Press release by Bursa Malaysia, 25 June 2024 [\[Link\]](#)



Head office of Bursa Malaysia in Kuala Lumpur.

CONCLUSION

The biggest challenge in financing the green transition lies in the efficient allocation of capital and the development of new sources from which capital can be generated for the net zero transformation. The current landscape of European finance, dominated by bank-centric approaches to green investment, is proving an inefficient and ineffective mechanism for mobilising the amount of capital needed for a sustainable future. This study underlines the urgent need for a more balanced and diversified financing model that can channel funds into green initiatives quickly and robustly.

A major obstacle is the fragmentation of European capital markets. This fragmentation significantly limits the ability of the system to raise and allocate capital for green investments on the scale needed to achieve climate targets. The study emphasises that the unification of these markets is crucial to increasing the overall strength and effectiveness of the European capital market. Such integration would not only facilitate more efficient capital flows. It would also create a more resilient and competitive financial ecosystem capable of supporting Europe's ambitious sustainability goals.

The study also sheds light on a crucial, but often overlooked, aspect of climate finance, namely the role of governments and the European Union as the main beneficiaries of climate investments. Given their position and the long-term societal benefits of sustainable development, these institutions are best placed to exert their influence as guarantors of green investments. By playing this role more vigorously, governments can significantly de-risk green projects, make them more attractive to a wider range of investors and thus accelerate the pace of the green transition. This approach, combined with efforts to diversify financing sources and unify capital markets, offers Europe a way of effectively mobilising the capital needed for its sustainable future.

The future of European capital markets is inextricably linked to the EU's ability to tackle climate change and drive sustainable economic growth. The findings of this study highlight the urgent need for transformative measures to reshape financial structures and policies.

By addressing the challenges of market fragmentation, over-reliance on bank finance and the need for effective risk mitigation, Europe can unlock the full potential of its capital markets to fund the green transition. The way forward requires a concerted effort by policy makers, financial institutions and investors to create a more integrated, diverse and resilient financial ecosystem.

Europe has arrived at this critical turning point. Decisions taken in the coming

years will not only determine its economic development, but also its role as a global leader in sustainable finance and climate protection. The possibility of reconciling financial innovation with environmental necessities offers Europe a unique opportunity: it can secure a prosperous, sustainable future, while at the same time setting a powerful example to the rest of the world.

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