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Europe's transformational scorecard

Tracking European sovereigns in their transformational journeys

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To help assess progress in Europe's transformation, we are introducing the DWS European Transformation Scorecard. With the use of quantitative metrics measured against their respective 2030 targets we track 13 European countries in their transformational journey across 12 sectors.

Our findings show that policy action and investment requirements are particularly essential in four key areas: electrifying the transportation sector, energy efficiency measures in real estate, improving healthcare outcomes and delivering on decarbonization more generally. Of all the 12 sector transformations, only the technology, digital economy and the social pillar can claim to be gaining some traction.

At a country level, Sweden is the winner, performing strongly in areas such as renewable energy, R&D spending and urban resilience with the Netherlands, and Switzerland as runners up. At the bottom of the scorecard lies Spain, Poland, and Italy, all of whom have regulatory environments that do not sufficiently encourage private sector investment.

The Scorecard therefore provides measurement on the delivery of a successful economic and policy transformation, which demands an agenda that combines competitiveness and strategic autonomy with private sector and policymakers working hand in hand.

But heightened geopolitical risk may add further fiscal burdens in terms of defence spending on European governments. NATO[1] expects European member countries to collectively spend 2% of their GDP on defence, and this may increase in future.

Europe faces at least a EUR2.5 trillion investment gap for green and digital goals (EU-27). Europe must therefore continue to innovate and adopt transformational technologies by creating a supportive regulatory environment and prioritise investing in research, development, and deployment. Deepening the Single Market and completing the Capital Market Union (CMU) should help to mobilize private capital, which are urgently needed to fulfil Europe's ambitious goals.

Introduction

This paper continues our series of European Transformation research papers[2] and is organised in four sections. The first section introduces the DWS European transformation scorecard, which aims to measure transformational progress. The second section identifies the areas where policymakers and investors can drive transformation and deliver positive impact. The third section examines the ways private capital can be unlocked to plug investment funding gaps and the final section presents a chartbook featuring the extent to which 13 European countries are performing against 12 key performance indicators (KPIs).

[1] NATO (February 2024)
[2] DWS Research Institute (2022-24) https://www.dws.com/insights/global-research-institute/european-transformation-research-hub/

1 / European transformation scorecard

1.1 Tracking transformation

Across Europe, the race is on to transform. In many sectors of the economy, the European Commission has set explicit targets[3] to be reached by 2030. But are European countries succeeding or has progress stalled or is it accelerating particularly in the aftermath of the Covid-pandemic and the ongoing war in Ukraine? In this section, we attempt to answer these questions.

To construct our European sovereign transformational scorecard, we focus on 12 sectors measured across 13 European countries. These countries will play a central role in driving the climate transition, shaping the region's industrial competitiveness, and addressing important social challenges. Combined, these countries account for three-quarters of European economic activity and over half of the region's population[4]. Our country selection is based not on the size of the economy, but rather on countries that are leading Europe in its transformation and providing a blueprint for other nations to follow.

To help assess progress, we have identified 12 KPIs, one for each sector, that we believe provide a good proxy for each sector's transformation, Figure 1. To ensure that we conduct a like-for-like comparison across the countries in our sample, we use European Commission targets. For example, under the European Climate Law, the EU has set a goal to cut g**reenhouse gas (GHG) emissions** by at least 55% by 2030 compared to 1990 levels. In the UK and Switzerland, the comparable 2030 reduction targets are 68% and at least 50% respectively[5].

For the energy sector, the European Renewable Energy Directive[6] targets the **share of energy from renewable sources** rising to at least 42.5% by 2030, with an aspirational goal of 45%. When it comes to biodiversity loss and efforts to reduce the pressure on natural resources, the European Commission enacted the Circular Economy Action Plan[7] in March 2020. As part of this programme, it aims to double the **share of used material resources** which come from recycled waste materials to 23.2% by 2030.

Figure 1: Sector transformations and their KPI proxies

Sector/theme	Key performance indicator
Climate	Greenhouse gas emissions (% change since 1990)
Energy	Share of energy from renewable sources (%)
Biodiversity	Circular material use rate (%)
Economic development	Research & development spending (% of GDP)
Technology	High-tech exports as a share of manufactured exports (%)
Transportation	Market share of battery electric vehicles (%)
Digital	Digital intensity level by share of enterprises (%)
Supply chains	Global Data battery materials supply chain vulnerability index
Urban resilience	Share of sustainability certified offices of the total office stock (%)
Water	World Bank regulatory quality index
Healthcare	Healthcare spending and life expectancy composite index
Social	Housing affordability and participation in education & training composite index

Source: DWS Research Institute (March 2024)

To address the region's lagging economic development because of weak industrial competitiveness, the European Commission has recommended country-level **R&D spending** should be more than 3% of GDP by 2030[8]. Efforts are also focused on increasing

[3] https://climate.ec.europa.eu/eu-action/climate-strategies-targets/2030-climate-targets_en#reducing-emissions---raising-our-ambition
[4] Eurostat (2023 data). Europe is defined as EU-27, the UK and Switzerland
[5] UK: https://assets.publishing.service.gov.uk/media/633d937d8fa8f52a5803e63f/uk-nationally-determined-contribution.pdf ; Switzerland https://www.bafu.admin.ch/bafu/en/home/topics/climate/info-specialists/emission-reduction/reduction-targets/2030-target.html
[6] https://energy.ec.europa.eu/topics/renewable-energy/renewable-energy-directive-targets-and-rules/renewable-energy-targets_en
[7] https://www.eea.europa.eu/en/analysis/indicators/circular-material-use-rate-in-europe
[8] Communication_Long-term-competitiveness.pdf (europa.eu)

the share of high-technology exports as a proportion of manufactured exports, which also play an important role in boosting a country's industrial competitiveness[9].

The transportation sector is also in need of radical transformation since it is the only major sector of the European economy that has seen GHG emissions rise over the past three decades[10]. Electrifying the European car fleet will enable this sector to decarbonise. Consequently, increasing **battery electric vehicles (BEV) sales** as a share of total car registrations will be critical in this ambition but also necessary given the European ban on petrol and diesel car sales which is set for 2035[11]. This would imply an 80% target of BEV sales by 2030.

Europe also needs to promote its digital economy since only 10 out of the world's top 100 tech companies are European, and only 8% of European SMEs are trading across one European border[12]. The digital transformation of Europe is framed under the Digital Decade policy programme for 2030[13]. This targets more than 90% of SMEs reaching at least a basic level of **digital intensity** by 2030[14].

With few natural resources, Europe has become increasingly dependent on sourcing raw materials for the climate transition and the digital transformation from outside the EU. To address this, the European Commission is prioritising ways to create and secure resilient supply chains. We therefore assess the exposure of European countries to supply chain risks via Global Data's battery materials **supply chain vulnerability index**. This provides a proxy for some of the commodities essential for the climate transition.

With increasing regulation also focused on the energy efficiency of buildings[15], our urban resilience KPI tracks the share of **sustainability certified offices** versus the total office stock. When it comes to the water sector, we employ the World Bank's **regulatory quality index**. This captures the ability of a national government to formulate and implement sound policies and regulations that permit and promote private sector involvement. Previous DWS analysis[16] has shown that the level of regulatory quality in a country is positively correlated with private investment in water infrastructure.

Finally, Europe needs to address important social issues such as an ageing population, housing affordability and retraining its workforce for the industries of the future. To gauge progress in health systems which are resilient to an ageing population, we introduce a proprietary composite KPI which monitors **healthcare spending alongside life expectancy outcomes**.

Next, we have created a composite social KPI focusing on housing affordability and training and education. For housing, the European Commission measures the **housing cost overburden rate**. This calculates the share of the population where mortgage payments or rental costs exceed 40% of disposable income. For training and education, we assess progress towards reaching the 60% target of all **adults participating in some form of training** every year by 2030 as outlined in the European Pillar of Social Rights Action Plan[17].

Scorecard methodology:

Armed with the raw data for each of the 12 KPIs across 13 countries, we calculate the percentage change in each KPI relative to their respective 2030 target. For example, Austria's 6% decline in GHG emissions since 1990 compares with the 55% decline 2030 target rate. This delivers Austria a score of 0.11 (-6/-55) or, put another way, the country has travelled just 11% in its decarbonization journey. However, we bound individual KPI scores between +1 and -1 to ensure that a country which has surpassed its target (or is moving in the opposite direction), is not over-rewarded (or over-punished).

To calculate the overall score, we assign equal weights to each KPI and then aggregate. The final score in percentage terms provides an indication of how much a country has travelled in its transformation across all 12 sectors and thereby providing an implicit indication of how much more of the journey lies ahead.

[9] https://research-and-innovation.ec.europa.eu/strategy/strategy-2020-2024_en
[10] WEF (September 2022). The European Union has cut greenhouse gas emissions in every sector – except this one
[11] https://ec.europa.eu/commission/presscorner/detail/en/ip_22_6462
[12] https://www.digitaleurope.org/resources/europe-2030-a-digital-powerhouse-digitaleuropes-manifesto-for-the-next-commission/
[13] https://cdn.digitaleurope.org/uploads/2023/11/DIGITALEUROPE-EUROPE-2030-A-DIGITAL-POWERHOUSE-FINAL_DECEMBER_WEB.pdf
[14] The other digital goal is that 75% of EU companies should use cloud computing services, perform big data analysis, and use artificial intelligence. We have excluded these three metrics in our scorecard due to a lack of comparable data for the UK and Switzerland
[15] https://energy.ec.europa.eu/topics/energy-efficiency/energy-efficient-buildings/energy-performance-buildings-directive_en
[16] DWS Infrastructure Research (January 2021). The shape of water infrastructure.
[17] https://ec.europa.eu/social/main.jsp?catId=1607&langId=en

1.2 European transformation scorecard results

Figure 2 presents the results of our aggregated European transformation scorecard. On our estimates, Sweden, the Netherlands, and Switzerland have made the most progress, having completed just over two-thirds of their transformational journey. At the bottom of the scorecard are Spain, Italy, and Poland, who are close to the halfway mark.

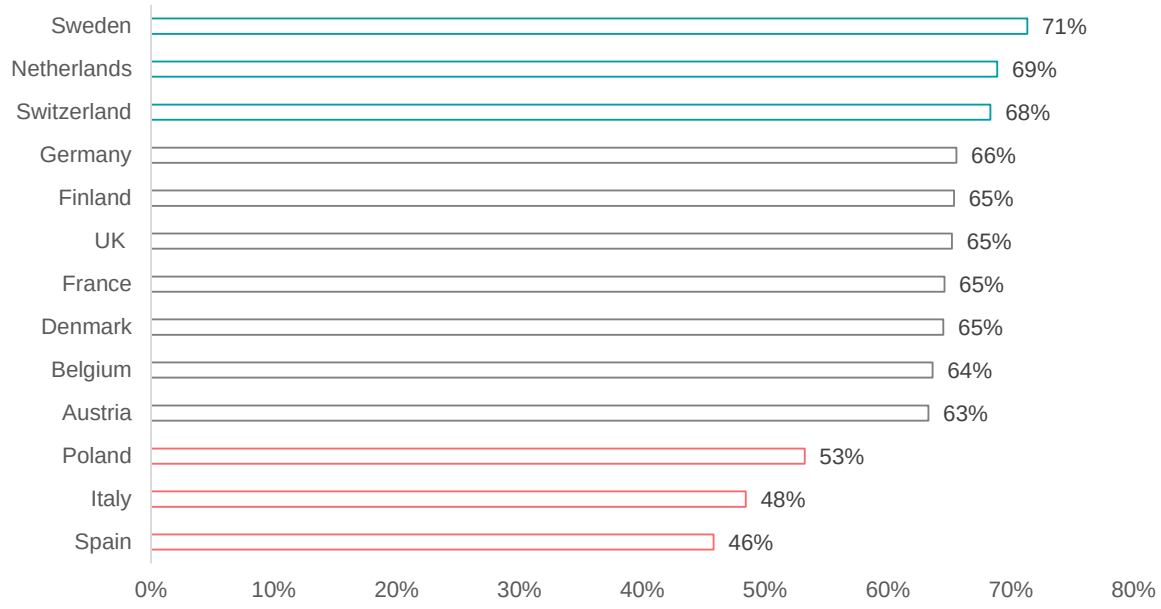
If we dig a little deeper, we find that Sweden has been rewarded by its strong renewable energy share, high R&D spending, rising electric vehicle car sales, urban resilience and pro-business working environment. Progress in the Netherlands has been driven by its relative leadership in the areas of the circular economy, high technology exports, the digital transformation, and social progress. Switzerland, has been a strong performer in R&D spending and high technology exports. However, these countries cannot rest on their laurels. To boost their scores even more, Sweden needs to focus on promoting the circular economy, the Netherlands should aim to increase its share of renewables in its energy mix, and Switzerland should consider steps which encourage more electric cars on its roads.

What may come as a surprise is the rather mixed performance across the Nordic region, which is often cited as the North Star for Europe's transformation. While this may be true for renewable energy generation, the digital transformation, and their pro-business environments, this leadership role falls away on several key metrics. For example, Denmark ranks low when it comes to health spending outcomes, urban resilience and housing affordability while Finland is marked down due to its low share of high technology exports. In addition, both countries are struggling to increase the amount of materials they use from recycled waste, which is an important part of Europe's Circular Economy Action Plan.

The scorecard inevitably simplifies what are complex transformations across multiple sectors. For example, we find a large cluster of countries in the middle of the pack, apparently neck-and-neck in the transformation race. However, this disguises a significant divergence of sector transformation within and between countries, which is illustrated in greater detail in our transformation chartbook in section 4.

Take Germany, which ranks at or close to the top of the scorecard when it comes to greenhouse gas emission reduction, housing affordability and retraining its workforce, but ranks bottom on supply chain resilience for commodities critical to the climate transition. Our supply chain KPI has punished Germany since we have focused on supply chain vulnerability for battery materials critical to the auto sector. If a broader measure of supply chain vulnerability had been used, where Germany is more resilient, the country could have a chance of toppling Switzerland from its bronze medal position on the podium.

Figure 2: European transformation scorecard



Source: DWS Research Institute (March 2024)

Next door in France, the country can lay claim to leading Europe in terms of healthcare outcomes but trailing far behind in its digital transformation. The wide dispersion of performance is replicated in the UK who leads Europe in the scale of GHG emission reduction since 1990, but ironically needs to ramp up renewable energy beyond the power generation sector.

This leaves the European laggards: Spain, Italy, and Poland who lie at the bottom of the scorecard. All these countries have regulatory environments which do not sufficiently encourage private sector involvement. In addition, Spain is completely off course when it comes to decarbonizing since its GHG emissions have risen since 1990. In Italy, the country's ranking has been punished by low levels of R&D spending, which spells trouble for the country's industrial competitiveness as well as minimal battery electric vehicle car sales and a disappointing level of high-technology exports. Poland has been marked lower by its slow progress in its digital, health and transportation sectors. However, the country has been rescued to some degree by strong scores in supply chain and urban resilience, where it has ranked top of the European scorecard.

Our next step in this analysis is to create a country-sector heat map to show not only where a country has a high, medium, or low chance of meeting its transformation target for a particular sector, but also the direction of travel, Figure 3. This momentum dimension examines the rate of change of sector transformation since 2019, and specifically whether the rate of change towards its 2030 target is positive, flat, or moving in reverse. For example, Germany is ranked higher than the UK when it comes to the climate KPI since although GHG emission reduction has been greater in the UK since 1990, GHG emission reduction in Germany over the past two years has surpassed that in the UK where emissions are higher over the period.

The heat map is calibrated with six colours to capture these two dimensions: from dark orange (low probability of meeting target with negative momentum) to dark green (high probability of meeting target and positive momentum). To help to understand where sector transformation and country rankings might change over the coming year(s), we have assigned scores to the six colours ranging from -3 for dark orange to +3 for dark green.

Figure 3: The European Transformation country-sector heat map

	Climate	Energy	Biodiversity	Economic development	Technology	Transportation	Digital economy	Supply chains	Urban resilience	Water	Healthcare	Social	Country score
Sweden													13
Netherlands													9
Switzerland													9
Germany													11
Finland													10
UK													2
France													-7
Denmark													4
Belgium													1
Austria													3
Poland													-22
Italy													-25
Spain													-26
Sector score	-9	-3	0	2	9	-14	8	-1	-8	1	-8	5	

Source: DWS Research Institute (March 2024)

From a sector transformation perspective, the heat map reveals European policymakers need to focus across multiple fronts, but four sectors stand out: electrification of the transportation sector (-14), climate (-9), energy efficiency measures in real estate sector (-8) and healthcare (-8). Of all the 12 sector transformations, only the technology (+9), digital economy (+8) and the social pillar (+5), can claim to be gaining some traction.

We also see a significant performance disparity between European countries and their transformation. For example, those countries who are leading in transformation have strong momentum, while those who are struggling are at risk of being left further behind. Meanwhile, at an individual country level, Sweden seems assured of keeping its pole position with a momentum score of +13. Germany and Finland also score highly on this measure, and this may provide them with a chance of moving closer towards the top of the leader board. However, France in the middle of the pack has a momentum score of -7 indicating that its transformation is in danger of moving in reverse. But of most concern are the results for Spain (-26), Italy (-25) and Poland (-22) where the likelihood of meeting targets is low and where policy intervention and investment requirements are high to get these countries on the right track.

2 / The role of policy in accelerating the transformation

To accelerate the transformation across all sectors identified in Section 1, here we focus on two specific areas where policymakers and investors can drive positive impact. These are capturing the Single Market's potential and advancing innovation.

2.1 Deepening the Single Market

As the European Union approaches its June elections and the start of a new political cycle, the debate surrounding European economic policy has increasingly focused on competitiveness. For example, Commission President von der Leyen stated in her State of the Union speech[18] that "Europe will do 'whatever it takes' to keep its competitive edge".

In February, the European Commission published its Annual Single Market and Competitiveness report that detailed the competitive strengths and challenges of Europe's Single Market and tracked yearly developments according to the nine competitiveness drivers[19]. The functioning of the Single Market was identified as one of the crucial contributors for the EU's competitiveness.

The European Single Market was established in 1993 to allow for the free movement of goods, services, people, and capital. The Single Market is one of the world's largest integrated market areas (EU population: 450mn; vs. U.S population: 332mn). While the Single Market has undoubtedly brought real economic and political benefits to European citizens, businesses, and governments, there are still longstanding structural issues undermining the realization of its full potential.

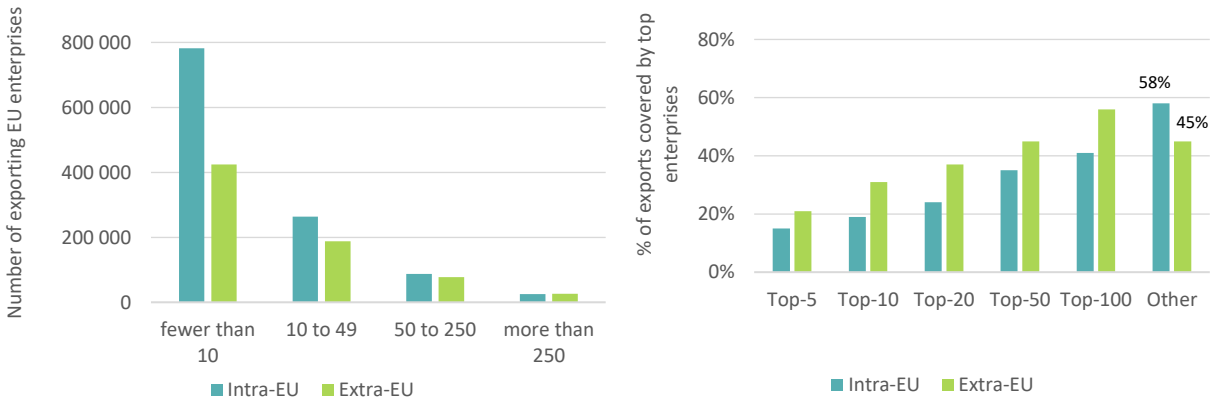
For instance, Single Market integration was 26.3% for goods in 2022, up from 23.5% in 2021, and 7.5% for services in 2022, up from 6.6% in 2021 (measured as trade over GDP)[17]. The fully functioning Single Market would solve a question of scale and, by the Commission's own estimate, would deliver a budget-neutral boost in growth of over €700bn between now and 2030.

The Single Market is especially important in boosting SMEs' internationalization and competitiveness. As shown in **Figure 4**, the Single Market is the key export destination for SMEs. The number of EU micro firms exporting goods within the Single Market (intra-EU) is almost twice the number of those exporting goods outside of the EU (extra-EU). In contrast with extra-EU exports, intra-EU exports are less concentrated in a few (larger) businesses, and which is true across both goods and services.

Figure 4: The Single Market is the key export destination for SMEs.

Number of EU enterprises, categorised based on the number of employees, exporting goods inside & outside the EU.

Share of exports covered by top enterprises (Top-5 to Top-100) and smaller companies (other) inside & outside the EU.



Source: European Commission (2023) Annual Single Market Report. Note: Intra- EU – within the Single Market; Extra-EU – outside of the Single Market.

This year the European Commission is expected to release two new reports focused on the future of the Single Market and of European competitiveness, with both of which expected to give recommendations for the legislative focus over the 2025-2029

[18] European Commission 2024 State of the Union speech
[19] European Commission (2024) Annual Single Market and Competitiveness Report

period. These two critical reports are being prepared by two former Italian prime ministers, Enrico Letta and Mario Draghi and should be released in March and June, respectively. To move this agenda forward, Belgium and Hungary who hold the presidency of the Council in 2024, have pledged to use their respective six months chairing of the Council to focus on competitiveness and the Single Market.

2.2 Accelerating innovation

Europe's competitive strength has long been based on industrial excellence, especially in such sectors as automotive, chemicals, materials, and fashion. However, technology is now permeating all sectors via artificial intelligence (AI), quantum computing, cloud, and other digitalisation tools. Thus, development and adoption of frontier technologies is increasingly becoming critical for Europe to preserve its competitive edge, especially in the world of growing geopolitical tensions. Policymakers should accelerate development of policies that support innovation across different sectors and help to speed up the broad commercialisation of innovation.

According to a 2022 McKinsey report on Europe's competitiveness, the continent only leads on two transformational technologies (next-gen materials and clean technologies), while trailing the United States and China in areas such as artificial intelligence (AI) and quantum computing[20].

Europe has had a strong record of academic research, producing one fifth of the top 10% most cited scientific publications. The EU's research and innovation (R&I) investments have increased from 2.08 % in 2012 to 2.30 % in 2020, decreasing in 2022 to 2.23%. It therefore remains below the target of 3% and is unevenly distributed across regions and Member States[21]. These investments remain below those in the USA (3.4% of GDP) and China (2.4%). However, a more important issue is the efficiency of these investments that is often hampered by persistent structural challenges, such as weak science-business linkages and unavailability of capital to scale and industrialize the novel technologies developed in a lab.

EU's initiatives such as Horizon Europe, that will run from 2021 to 2027 and has a budget of EUR95 bn, is an essential tool to boost innovation research and foster collaboration at European level. Importantly, the program is open to all types of research organisations, including large businesses, SMEs, academia, public institutions and third sector organisations with the aim of promoting the partnership between countries and between the public and private sector.

One of the highest priorities for innovation and broad commercialisation is climate- and energy-related technologies, also called cleantech. Cleantech encompasses a wide range of technologies, including well-established solar, wind, and hydro power, as well as newer technologies, including fusion, next-generation energy storage, smart grids, carbon capture, use, and storage (CCUS), and hydrogen. Cleantech is in the centre of the green transition and is one of the most promising areas where the EU can and should further develop its comparative advantage. The region leads on patents and venture capital funding; it also uses the highest share of renewables in its overall energy mix. It could build on its strong position in the fields of circularity, advanced materials, technologies for energy-intensive industries, and the automotive and transport industries.

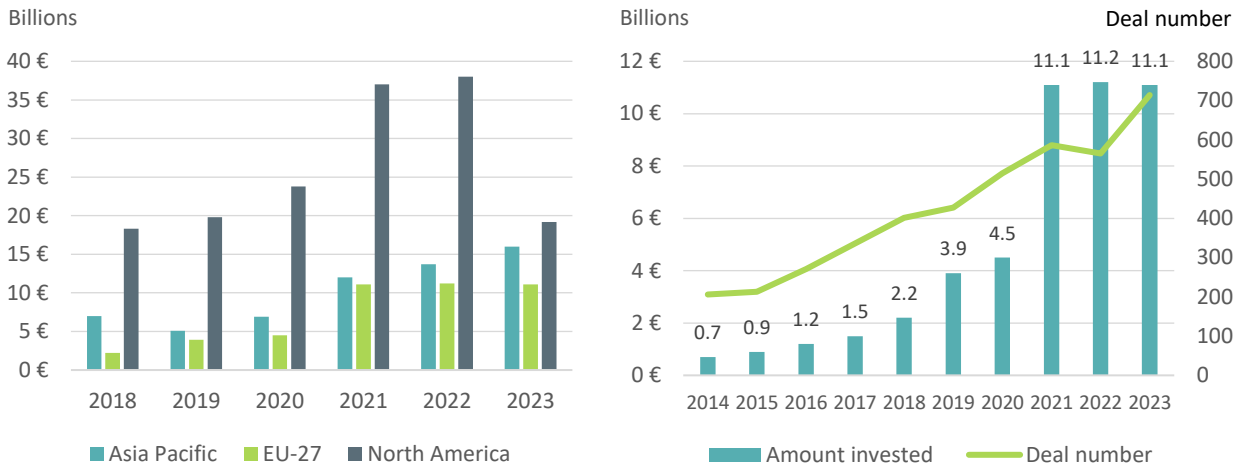
In 2023, more than €11 billion of venture and growth capital was invested in EU-based cleantech, representing a 15x increase over 2011, **Figure 5** (left hand side)[22]. Although cleantech venture capital investments are still largely dominated by the U.S., with the Asia Pacific region in second place, the investment in the EU proved more resilient to high interest rates than in the U.S. in 2023. At €11 billion, early-stage deals representing more than four times of the total number of deals.

However, when considering scale-up capital, the U.S. has been attracting most investments for the past few years. In the EU, despite a wide availability of research and innovation grants and of venture capital for early-stage deals, there is apparent lack of investment on the critical scale-up stage, especially for newcomers. For example, in the 2021 EU Innovation Fund results, of the call for small-scale projects, big industrial companies were 70% of the recipients, and 100% of the recipients in the large-scale call projects[20].

Some "scale-up" success stories are starting to emerge in Europe, for example H_2 Green Steel[23] in Sweden or Northvolt AB, Europe's first circular gigafactory battery manufacturer, in financing which Deutsche Bank has had a lead role alongside other private and public banks, export guarantee agencies and automotive companies[24]. These fundraising successes must urgently be replicated in other technologies.

[20] McKinsey Global Institute (September 2022) Securing Europe's competitiveness: Addressing its technology gap
[21] Eurostat (2023) R&D expenditure
[22] Cleantech for Europe (2024) A Cleantech Investment Plan for European Competitiveness
[23] Reuters (January 2024) Sweden's H2 Green Steel raises $5.2 bn in new funding
[24] Deutsche Bank (January 2024) Northvolt case study

Figure 5: Cleantech venture capital by region (left) and EU-27 cleantech venture and growth investment (right)



Source: Cleantech for Europe (2024) A Cleantech Investment Plan for European Competitiveness

Another innovation area that is likely to define the next decade and beyond and has a strong potential to boost Europe's economy is artificial intelligence. While Europe is currently lagging on investments in generative AI (in 2023, Europe invested US$6.4 billion, compared with US$31 billion in the US[25]), it can adopt a differentiated approach for technology adoption and development.

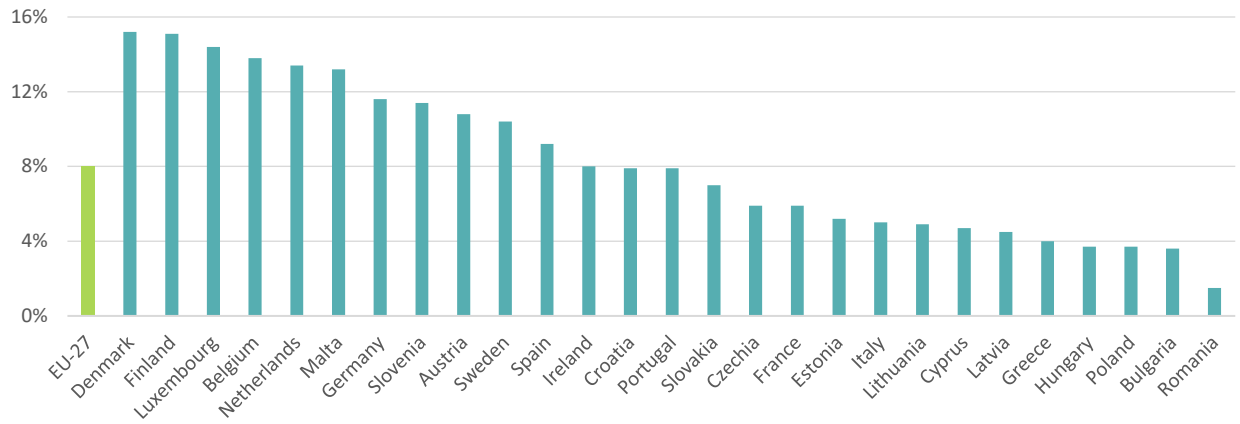
On AI adoption, Europe should lean in on its natural strengths: a sophisticated industrial base. Investing strategically could enable Europe to compete in such areas as autonomous driving, AI in manufacturing and robotics, in healthcare and in research and development (for example, for advanced materials or drugs discovery). Additionally for Europe gen AI itself can be a unique tool for partially overcoming some of the negative aspects of fragmentation such as differences in languages and legacy IT architectures. It has also a potential to advance sustainable finance and to harmonize national capital markets. On the AI development side, Europe can place strategic bets a unique position in the global semiconductor value chain, on developing specialized foundational models, new forms of banking (including blockchain), or B2B applications.

While trailing on the technology side, the EU is leading on the gen AI regulation based on a risk-based approach. In December 2023, the EU Council and Parliament agreed the EU AI Act[26], the world's most far-reaching and comprehensive legal framework for the regulation of AI systems across the EU. The aim of the legislation is ensuring that AI systems are "safe" and "respect fundamental rights and EU values", but it also looks at encouraging AI investment and innovation in Europe. Member States will implement this law in national legislation over the next two years. Regulatory sandboxes can facilitate firm financing, market-entry and increase speed-to-market by reducing administrative and transaction costs.

European policymakers should focus getting businesses to adopt AI, continue supporting research and development, and training for skilled workers to develop and adapt AI. In 2023, 8 % of all EU enterprises used artificial intelligence technologies. As with cloud computing, its use was more common in large businesses (28%) than in SMEs (7%)[27]. Denmark, Finland, Luxemburg, Belgium, and the Netherlands had the highest degree of AI penetration, **Figure 6**.

[25] CB Insights, State of AI, Global, 2023 Recap.
[26] EU Council (December 2023) AI Act – Council and Parliament strike a deal
[27] Eurostat (2023), Use of artificial intelligence in enterprises

Figure 6: Enterprises using AI technologies in 2023



Source: European Commission (2023) Use of artificial intelligence in enterprises.

Interestingly, a recent survey by Workday showed that leaders from Europe and Africa were taking the lead on embracing AI technology. 52% of those leaders polled said that they welcome AI and Machine Learning (ML) adoption in their organization, compared with 50% in the Americas and 46% in Asia-Pacific and Japan[28]. Within Europe and Africa, business leaders in Germany are the most sceptical about AI's transparency and are also some of the most concerned about its trustworthiness, alongside the UK and Denmark. Business leaders in Switzerland are far less concerned about trustworthiness, which could be because of the country's clear and transparent regulatory environment. Hopefully, the implementation of the EU AI Act will further boost trustworthiness and adoption of AI among all EU Member States, companies, and the population.

[28] Workday (2023) Preparing to power up: EMEA leads the way to an AI-driven future,

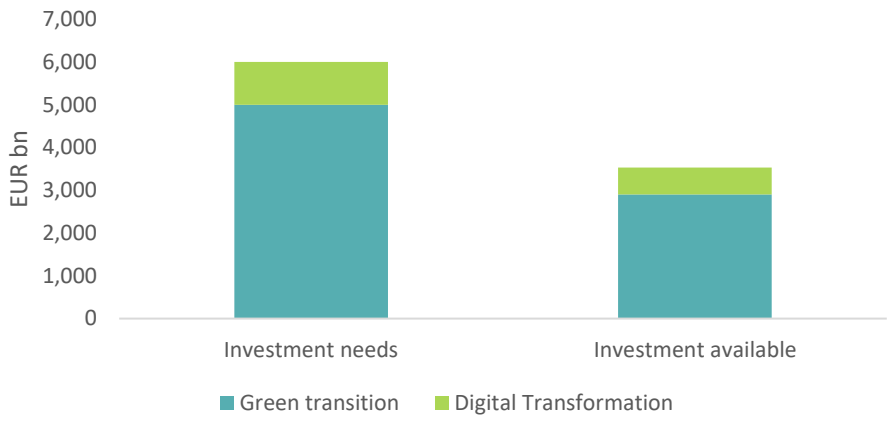
3 / Capital for transformation

In this section, we estimate investment requirement needs across key sectors alongside public sector funding. In so doing, we aim to identify where private sector capital will be required most to help support Europe's transformation. We provide suggestions as to how private sector capital can be mobilised. We then outline examples of investment solutions for some of the sectors identified in section 1. For example, in the areas of the energy transition, the digital transformation, and the buildings sector.

3.1 Closing the EUR 2.5 trillion investment gap for Europe's climate and digital goals

Our analysis finds that Europe has at least a EUR 2.5 trillion investment gap for key climate and digital transformation goals, as outlined in Figure 7. These are typically spread across the buildings, energy, transport, digital, and green infrastructure sectors. While various public sector funding sources are available and could be made easier to access, a large part of the financing falls to the private sector. The EU could continue to improve its tracking of investment needs and deployment.

Figure 7: European investment gap until 2030 for climate and digital goals (EU-27)



Source: DWS analysis March 2024 based on European Commission (2021-24), NXP (2022), Morgan Stanley (July 2023) Powering Europe.
For this chart, Europe is defined at EU-27

3.2 Capital Markets Union & expanding small- and medium-sized enterprises' financing

Much legislation has been passed under the Capital Markets Union (CMU). However, further action is necessary since progress has been slow to date and the full benefits of the single market have not yet been achieved. For instance, market-based financing can stimulate equity funding that is more suitable for SMEs or higher-risk innovative projects, reducing the heavy reliance on bank-based financing. Europe has just 8% of the volume of the US securitisation market, which is an important instrument for helping expand banks' lending capacity[29]. The EIB reports that availability of finance is an impediment for 44% of EU businesses[30]. Direct lending can therefore have an important role to play.

Facilitating small- and medium-sized enterprises access to loans

DWS's 2023 report Direct Lending and the European Transformation described how direct lending strategies are an alternative to banks as a source of loans and provided case studies of companies involved in the digital, and health sectors. Our 2024 Direct Lending outlook report examined market, sector, and country opportunities. For borrowers, direct lending offers speed, convenience, and flexibility by working with a single or small number of lenders. For banks, facilitating more private direct loans for SMEs, allows banks to free up their balance sheet for loans to more companies and individuals. Direct lending can work with private equity owners of fast-growing SMEs to encourage progress on ESG priorities such as energy efficiency or adoption of digital technologies, through sustainable linked loans that give an interest rate incentive to make improvements.

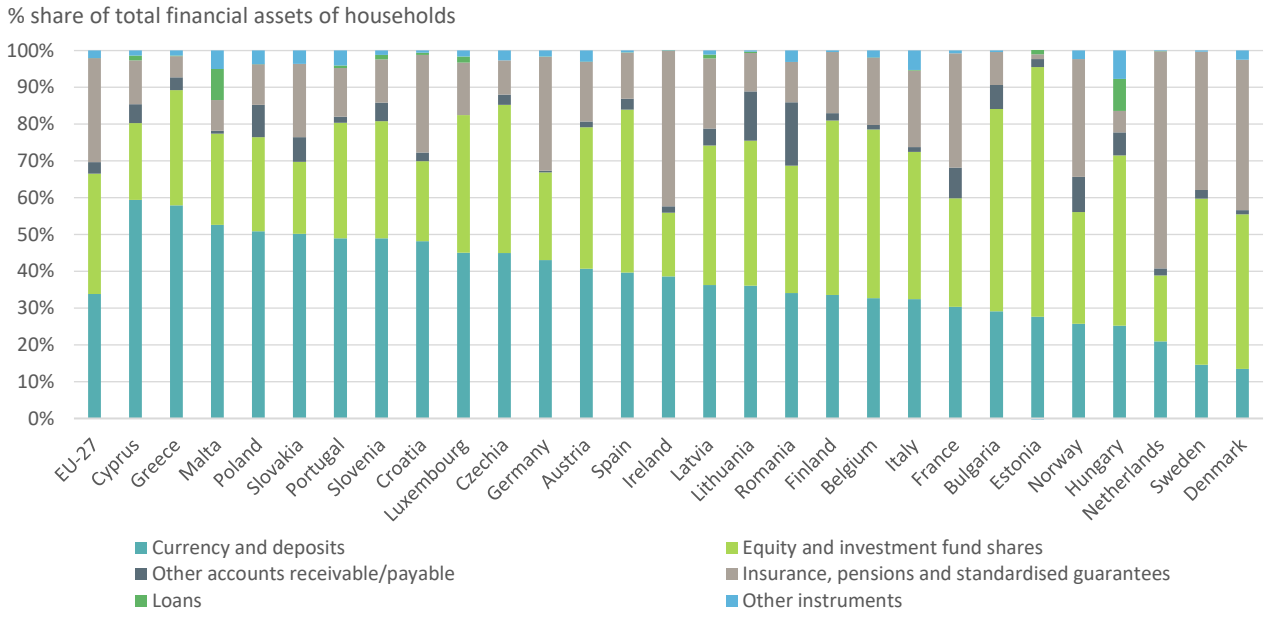
[29] ECMI 2023; AFME, Eurostat 2023
[30] EIB 2023

3.3 Mobilising households' savings towards transformation

The priority of the Capital Markets Union (CMU) is to deepen households' capital markets participation. Figure 8 shows that many households have high levels of cash savings. However, the rate of capital market participation by households varies significantly, with the Nordic countries' participation significantly higher than Mediterranean and eastern European countries.

Countries with the lowest share of deposits, such as the Netherlands, Sweden, and Denmark, tend to have the highest share of wealth in pensions. This situation reflects long-lasting policy efforts in these countries to achieve high coverage of funded pensions through mandatory or quasi-mandatory arrangements[31]. In other parts of the world such as the U.S., households in general have higher levels of capital market investments. Stronger financial education alongside tax incentives can play a crucial role in encouraging citizens to save in capital market instruments and long-term investment products.

Figure 8: High levels of cash savings in many households could be mobilised towards transformation



Source: Eurostat, Households - statistics on financial assets and liabilities, 2022.

Facilitating investment in real asset focused funds can help to contribute to goals to increase households' capital market participation and provide capital for Europe's transformation, as highlighted in the box below.

Facilitating retail investor access to infrastructure and real estate

The EU updated its European Long-Term Investment Fund (ELTIF) policies and some Member States have also updated relevant legislation to facilitate investment funds allowing retail investors to allocate to areas such as sustainable infrastructure and real estate.

We observe a growing number of investment strategies that offer retail investors the opportunity to invest in infrastructure projects in Europe. For instance, an open-ended infrastructure investment strategy can focus on unlisted renewable energy, sustainable transport, and digital-related assets. Retail focused real asset strategies are part of the solution to increasing households' participation in the capital markets.

[31] Household Participation in Capital Markets. European Fund and Asset Management Association, EFAMA. (September 2020)

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3.4 Investing in energy transition and digital infrastructure

Europe has made significant progress in deploying renewable energy, energy efficient and electric vehicle technologies, due to a combination of public policies and incentives. In 2023, clean energy investment in Europe hit US$341bn compared with US$303bn in the U.S. and US$676bn in China[32]. An assessment of European firms[33] found that they made EUR62bn of investments in gigabit digital infrastructure and EUR59bn in 5G over 2009-2021. Continued progress will depend on progress in implementing public policies, effective incentives, and investment by individuals, companies, and private market investors.

Sustainable infrastructure, digital, and transport investments[34]

DWS's European Infrastructure Strategic Outlook[35] concludes that owning or lending to sustainable technology or digital solution providers is an opportunity for significant capital deployment and can help facilitate green, energy efficient, and digital investments across the economy. For instance, a loan to a renewable technology installation company could help homeowners to install technologies with no upfront cost. An infrastructure investor could acquire and help scale up the energy transition focus of the many small companies that install and maintain energy related technologies in hotels, supermarkets, and other buildings. Owning a transport company could have a focus on the company's shift to electric vehicles. Providing capital to a fibre installation company could support the roll out of digital infrastructure.

3.5 Cleantech growth investments

To assess the availability of EU funding for cleantech and other technologies vital for the European transformation, policymakers should focus on looking beyond early-stage funding and look for solutions to unleash hundreds of millions of euros in debt instruments to build large-scale plants for validated technologies. This could be achieved by mobilizing institutional capital (insurers and pension funds) as venture and growth capital, mobilizing public guarantees to catalyse private investment (for example, European Investment Bank (EIB) instrument for the wind sector[36]), and mobilizing revenues from the EU Emissions Trading System (EU ETS) to scale up cleantech manufacturing.

Scaling up climate and energy related venture and private equity investments

Section 2 of our report shows the results of many private equity and venture capital funds receiving allocations, often from large institutional investors. But small and medium sized institutional investors may not have the capacity to conduct the relevant due diligence required for the growing number of PE and VC funds raising capital. A platform approach could allow more institutional investors to gain access to best-in-class energy transition focused funds and hundreds of underlying innovative companies. Such an approach could also be tailored to other priorities such as social or nature related investments. A platform approach to allocating capital to technology commercialisation could also be of strategic interest to large corporates and insurance companies[37] aiming to assess new technologies and business models for their corporate and insurance business priorities.

3.6 Energy efficiency and retrofitting buildings

The EU's energy efficiency goals aim for renovating 35 million buildings by 2030 with an annual investment of EUR 275bn[38]. Millions of square meters of buildings need to be renovated to meet new EU policies, but also to meet tenants' net-zero goals. Building renovation is an opportunity across listed and private real estate equity and debt, infrastructure equity and debt, direct lending, project finance funds, tech commercialisation, structured finance, and stewardship with real estate and other companies, banks, and policymakers. The forthcoming report will make policy recommendations to enhance investors' ability to deploy capital in this area.

For instance, as the Sustainable Finance Disclosure Regulation (SFDR) was designed with the public markets in mind, this creates difficulties for private markets funds such as real estate. DWS's Head of ESG for Real Estate is chair of the Sustainability Committee of the private real estate association INREV[39], which published several papers demonstrating how SFDR may distort investment

[32] BNEF (2024) Energy Transition Investment Trends
[33] EU Joint Research Center (2023) International benchmarking of private investments in Digital Decade thematic areas
[34] DWS (2024). For illustrative purposes only.
[35] DWS (January 2024) European Infrastructure Strategic Outlook
[36] EIB commits €5 billion to support Europe's wind manufacturers and approves over €20 billion in financing for new projects (December 2023)
[37] Geneva Association (2023) Climate Tech for Industrial Decarbonisation: What role for insurers?
[38] European Commission (2021) Renovation Wave
[39] INREV (European Association for Investors in Non-Listed Real Estate Vehicles) and SFDR

needed for carbon reduction through real estate. SFDR takes a snapshot approach: Article 9 real estate funds must therefore always be sustainable. However, private equity real estate funds should focus on renovating older buildings, meaning that inefficient older buildings would be held in the fund before the asset is transitioned. This means that Article 9 real estate funds will likely focus on new or already renovated buildings. The real estate industry proposed ways to reform sustainable finance policies to enhance capital deployment for building renovation.

Next generation offices

Future proofed sustainable offices do not exist in the quantities needed, in the locations necessary and with sufficient certifications, which creates an investment opportunity. DWS's report on Sustainable Next Generation Office identifies a grading system for evaluating offices' micro-location, ESG and net-zero alignment, alignment with the occupiers' expectations and asset specifications. A parallel report evaluated the attractiveness of major cities, while a separate report examined the financial performance of ESG certified offices during a price correction[40]. DWS's Real Estate Strategic Outlook concludes that 2024 could be an exceptional vintage year for real estate investment.

3.7 Housing for Europeans

Many of Europe's largest cities lack sufficient housing, with residential new development in places like Sweden running around 25% below required levels. High demand for housing and limited new supply, could contribute to rents growing well above inflation for the rest of the decade. This has implications for millions of peoples' cost of living, social cohesion, economic productivity, and public health when people live in overcrowded, unhealthy housing[41]. Our Scorecard Social indicator (#4.12) tracks the share of the population where mortgage or rental costs exceed 40% of disposable income.

INREV, the European Association for Investors in Non-Listed Real Estate Vehicles, published the first in a series of reports on institutional investment in European housing[42]. DWS real estate experts contributed to this report. The authors conclude:

> "*Institutional investment at scale has the capacity to expand the private rented sector and provide much needed long-term housing solutions for middle-income earners. In markets where institutional investment is nascent, the delivery of professionally managed, purpose-built assets has the capacity to transform the suitability, quality, and delivery of housing…There is a natural alignment between the objectives of long-term income investors and the private rented sector as it offers secure income, strong opportunities to invest sustainably and a symmetry of purpose in respect of the underlying beneficiaries of both the investment return and the housing provision."*

We believe the EU should deepen its efforts to work with Member States, public and private financial institutions, construction companies, NGOs, and tenant representatives to overcome policy and market barriers to investment in new housing. For instance, Germany's "Alliance for Affordable Housing" received expert input for the plan to build 400,000 new homes per year[43].

Healthy, green homes

DWS's European Real Estate Strategic Outlook[44] concludes that the fundamentals for multi-family residential remain strong, even with the sharp reduction in new building construction. Chronic, and increasing, undersupply in many major markets is likely to continue pushing up rents, especially in unregulated markets. DWS experts believe that residential assets will become a major part of the real estate investment universe, also helping to meet energy efficiency, and air quality goals [45].

[40] DWS (June 2023) Performance of green offices at a time of price correction.
[41] Eurostat 2024
[42] DWS is a member of INREV including as Chair of the ESG Committee. INREV (2024) Housing middle income Europe
[43] German Federal Government (2022) Alliance for Affordable Housing (Bündnis für bezahlbares Wohnen)
[44] DWS (January 2024) Europe Real Estate Strategic Outlook
[45] DWS 2021 European Living Experts and DWS (2021) An affordable approach to residential investment

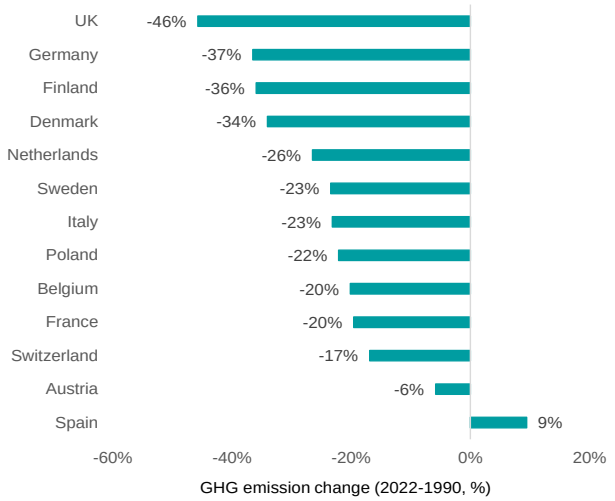
4 / Transformation chartbook

Leaders and laggards across the 12 sector KPIs

4.1 Climate

Greenhouse gas emission reduction (% change 2022-1990)

EU 2030 target -55%



Source: EDGAR (March 2024).

Comment

Under the European Climate Law, the EU has set a goal to cut greenhouse gas (GHG) emissions by at least 55% by 2030 compared to 1990 levels. In the UK and Switzerland, the comparable 2030 reduction targets are 68% and at least 50% respectively[46].

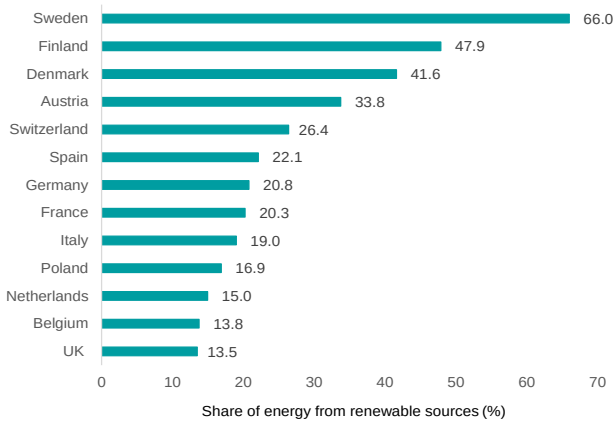
Since 1990 the UK, Germany and Finland lead the emission reduction leader scorecard. This contrasts with Spain and Austria where decarbonisation has barely started and in Spain's case GHG emissions have actually risen since 1990.

An additional area of concern is that over the past five years, the pace of GHG emission reduction across Europe's five major economies has slowed. EU elections this June may likely set the tone for climate legislation for the remainder of this decade.

4.2 Energy

Share of energy from renewable sources (2022)

EU 2030 target: 42.5%



Source: Eurostat (March 2024).

Comment

The energy sector is responsible for 75% of the EU's GHG emissions. As a result, increasing the share of renewables in the energy mix is a central part of reaching the continent's GHG emission reduction targets.

Since 2013, renewable energy generation in the EU has risen from 16.7% in 2013 to 23.0% in 2022. However, the Renewable Energy Directive[47] targets the renewable share rising to a minimum of 42.5% by 2030, with an aspirational goal of 45%.

Sweden, Finland, and Denmark stand out as renewable leaders. While the UK ranks in the middle of European countries in terms of renewables as a share of electricity production, when it comes to the share of renewables in the total energy mix, the UK ranks last followed by Belgium and the Netherlands.

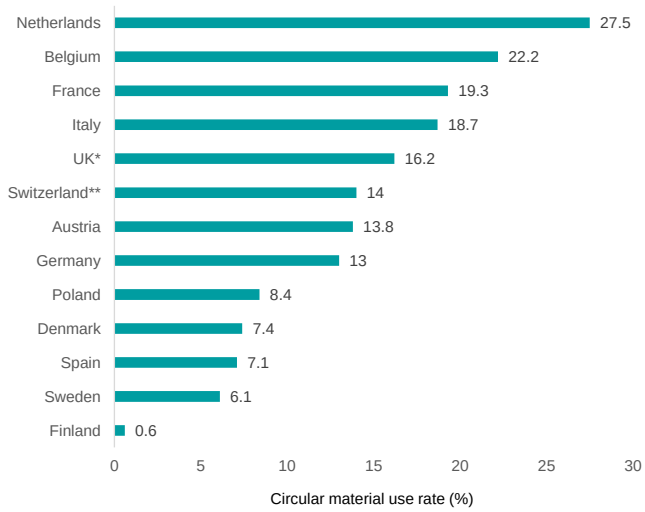
[46] EU-27: https://climate.ec.europa.eu/eu-action/european-climate-law_en UK: https://assets.publishing.service.gov.uk/media/633d937d8fa8f52a5803e63f/uk-nationally-determined-contribution.pdf ; Switzerland https://www.bafu.admin.ch/bafu/en/home/topics/climate/info-specialists/emission-reduction/reduction-targets/2030-target.html

[47] https://energy.ec.europa.eu/topics/renewable-energy/renewable-energy-directive-targets-and-rules/renewable-energy-targets_en

4.3 Biodiversity

Circular material use rate (2022)

EU 2030 target: 23.2%



* Switzerland data relates to 2021; UK data sourced from Eurostat (2019)
Source: Eurostat (February 2024). Swiss Federal Statistical Office

Comment

The European Union adopted the Circular Economy Action Plan[48] in March 2020. It forms a central part of the continent's ambition to reduce pressure on natural resources and help halt biodiversity loss.

As part of this programme, the EU aims to double the use rate of recycled material, that is the share of used material resources which came from recycled waste materials, from 11.5% in 2022 to 23.2% by 2030.

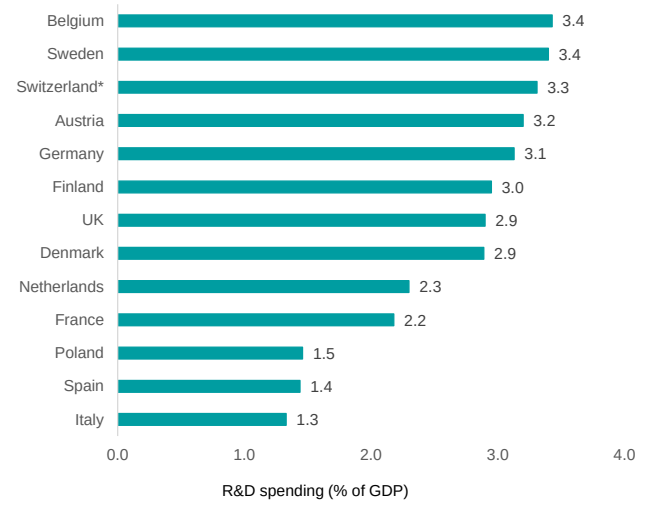
The Netherlands and Belgium not only top the league table when it comes to the use of recycled materials, but, they are also above or close to the 23.2% 2030 target.

Elsewhere in Europe, much stronger policy action is required, most notably in Finland, Sweden, Spain, Denmark and Poland, where the circular material use rate is below the EU-27 average and has fallen over the past decade.

4.4 Economic development

Research and development spending as a percent of GDP (2022)

EU 2030 target >3% of GDP



Source: Eurostat, World Bank (March 2024). *Switzerland data refers to 2021

Comment

One of the factors necessitating Europe's transformation is the need to address its weak industrial competitiveness. Part of this can be achieved by increasing spending on research and development, particularly since compared to other countries, such as the United States and Japan, R&D spending in Europe is around 1 percentage points lower as a share of GDP[49].

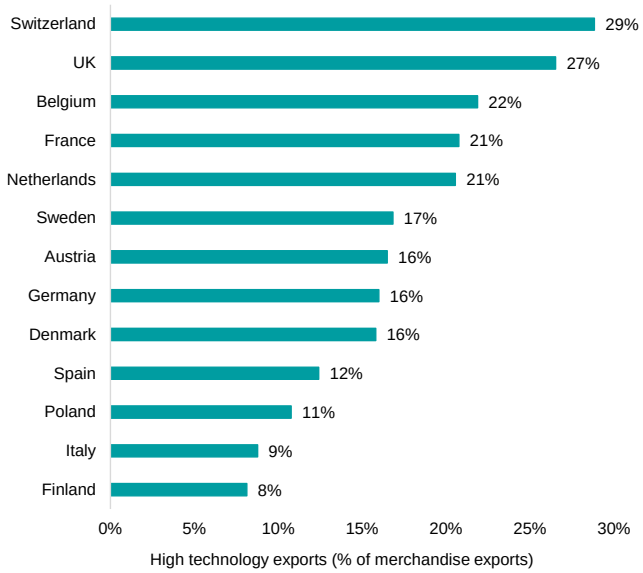
The European Commission has set a target that R&D spending should be more than 3% of GDP by 2030. In 2022, EU-27 R&D spending as a percent of GDP stood at 2.2%[50]. While the majority of the countries in our sample are close to or above this threshold, with Belgium and Sweden at the top of the league table, a number of countries fall significantly short.

For example, Italy, Spain, and Poland lie below the 3% target and in the case of Italy, its ratio has been falling slightly during this decade.

[48] https://environment.ec.europa.eu/strategy/circular-economy-action-plan_en
[49] R&D expenditure - Statistics Explained (europa.eu)
[50] Statistics | Eurostat (europa.eu)

4.5 Technology

High-technology manufactured exports as a percent of manufactured exports (2022)



Source: World Bank (March 2024).

Comment

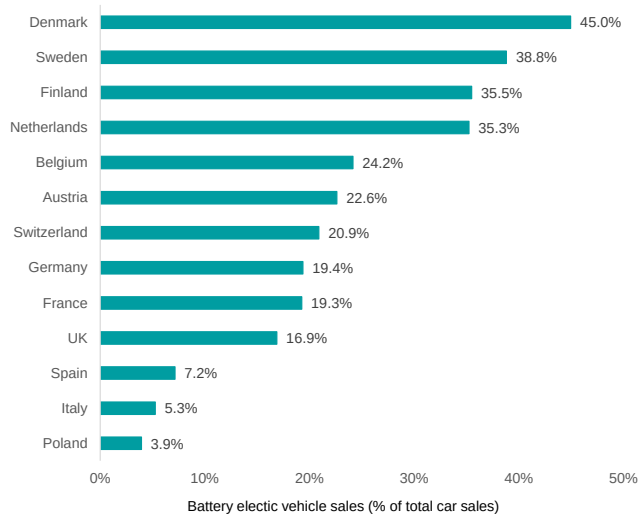
High-technology exports are products with high R&D intensity, such as in aerospace, computers, pharmaceuticals, scientific instruments, and electrical machinery. Like R&D spending, this KPI is often used as a proxy for industrial competitiveness.

Switzerland leads the pack not only as a share of its manufactured exports, but also from a momentum perspective as its ratio of high-tech exports has reported a strong rebound over the past five years. The UK follows close behind where exports are largely concentrated in the pharmaceutical and aerospace industries.

Meanwhile, France and the Netherlands have seen their share of high-tech exports decline relative to total manufactured exports. But the real laggard is Finland where the ratio is low and has fallen over the past decade.

4.6 Transportation

Market share of battery electric vehicles (2023)



Source: Eurostat, World Bank (March 2024). *Switzerland data refers to 2002

Comment

The transportation sector is the only major sector of the European economy that has seen GHG emissions increase over the past three decades[51]. Our KPI therefore measures the share of battery electric vehicle car sales of new car registrations. Given the European ban on diesel and petrol cars by 2035[52], we assume BEV sales need to reach 80% by 2030.

From almost no penetration of battery electric vehicles (BEV) six years ago, the share of BEV of the total car fleet has increased across all European countries in our sample.

The biggest gains in BEV market share have occurred in Denmark, Sweden, and Finland. This reflects high per capita income, higher levels of excise duties on diesel and gasoline transportation fuels and/or tax incentives in favour of BEVs.

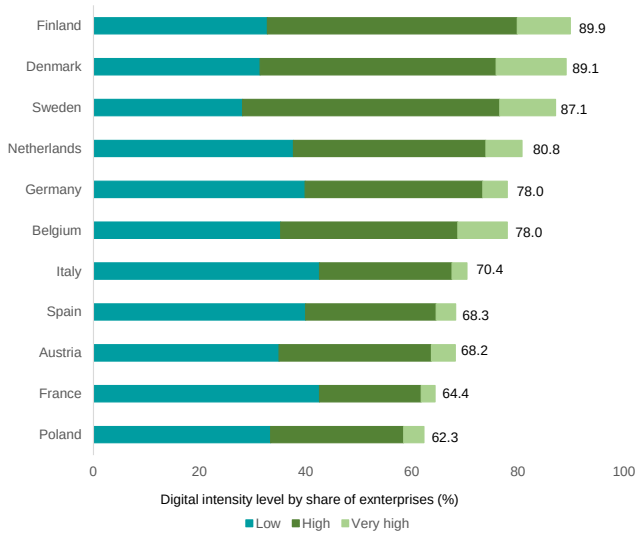
However, progress has been particularly slow in Poland, Spain, and Italy where BV sales account for less than 10% of total car sales.

[51] WEF (September 2022). The European Union has cut greenhouse gas emissions in every sector – except this one
[52] https://www.europarl.europa.eu/pdfs/news/expert/2022/11/story/20221019STO44572/20221019STO44572_en.pdf

4.7 Digital Economy

Digital intensity level by share of enterprises (2022)

EU 2030 target: 90% of SMEs with basic level of digital intensity



Source: Eurostat Digitalization in Europe (2023 edition) (March 2024).

Comment

Europe needs to promote its digital economy since only 10 out of the top 100 tech companies are European, and only 8% of European SMEs are trading across one European border[53].

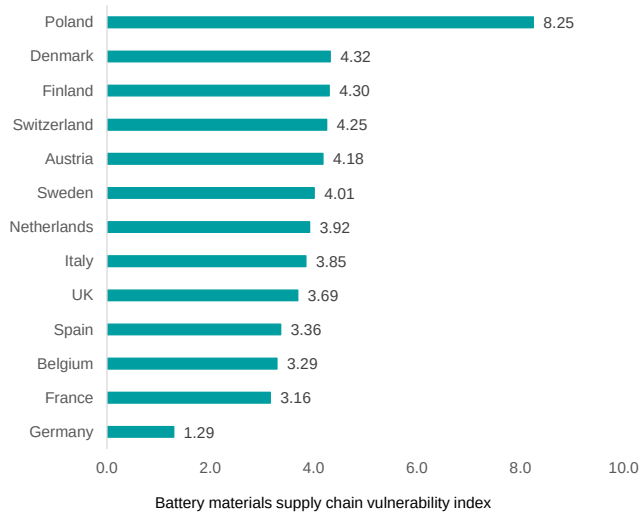
The digital transformation of Europe is framed under the Digital Decade policy programme for 2030[54]. The EU has set itself two main targets for the digital transformation of businesses by 2030: first, more than 90% of SMEs should reach at least a basic level of digital intensity, and 75% of EU companies should use cloud computing services, perform big data analysis or use artificial intelligence. Our KPI focuses on the former.

The proportion of SMEs with a basic level of digital intensity ranged from Finland, Denmark, and Sweden at the top to Poland and France at the bottom. While the UK and Switzerland lie outside the scope of Eurostat data, we have proxied these country scores via IMD's digital competitive rankings, which place both countries in the top half of the country league table.

4.8 Supply chains

Global Data's supply chain vulnerability index (2022)

EV battery materials



Source: Global Data-Comtrade (March 2024).

Comment

With few natural resources, Europe has become increasingly dependent on sourcing raw materials for the climate transition and the digital transformation from outside the EU. To address this, the European Commission is prioritising ways to create and secure resilient supply chains.

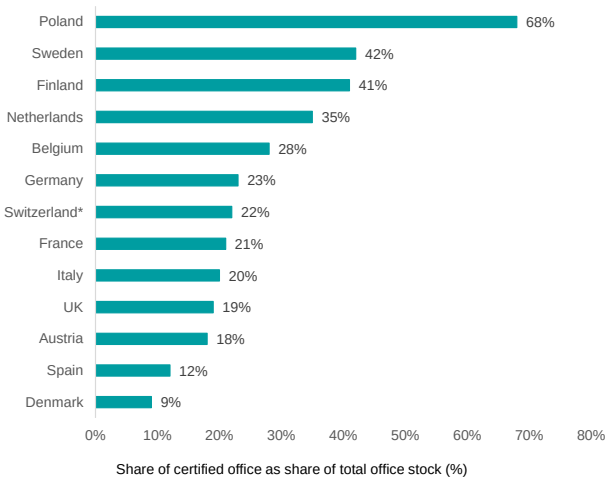
Here, we present Global Data's supply chain vulnerability index for electric vehicle battery materials. Germany's exposure reflects not just the economy's gearing to the auto sector but also the high dependency for critical raw materials outside the EU. On the other side of the spectrum, Poland is found to be the most resilient of the countries across our sample.

From a global perspective, the U.S. is even more vulnerable, scoring 1.0. This might help explain one of the key motivations behind the U.S. government's Inflation Reduction Act, part of which was focused on providing tax credits to help strengthen supply chains.

[53] https://cdn.digitaleurope.org/uploads/2023/11/DIGITALEUROPE-EUROPE-2030-A-DIGITAL-POWERHOUSE-FINAL_DECEMBER_WEB.pdf
[54] https://commission.europa.eu/strategy-and-policy/priorities-2019-2024/europe-fit-digital-age/europes-digital-decade-digital-targets-2030_en

4.9 Urban resilience

Certified office buildings as share of total office stock (2023H1)



Comment

Buildings account for roughly a third of GHG emissions in the EU[55] and consequently they are an integral part of achieving the continent's net zero goals. Regulation focused on the energy efficiency of buildings[56] aims to transform the sector.

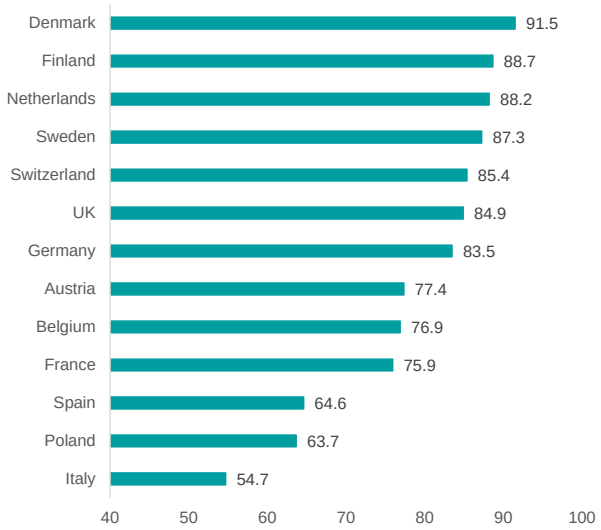
To assess progress in improving the building stock, our urban resilience KPI tracks the share of sustainability certified offices of the total office stock across the major economic hubs. This metric is therefore measured on a city-by-city basis which naturally can vary significantly within a country.

Wit this caveat in mind, the results provide for interesting reading since it shows Warsaw has the highest share of sustainability certified office premises across Europe and by a significant margin. Meanwhile Copenhagen, Madrid and Vienna lie significantly below the 22% European average.

* Data unavailable and so we have assumed EU average
Source: CBRE (November 2023). Is sustainability certification in real estate worth it?

4.10 Water

World Bank regulatory quality index (2022)



Comment

Improving Europe's water infrastructure including reducing water usage and increasing water recycling has become an urgent task and will be particularly relevant for those countries where water resources are under significant strain.

The challenge is that the provision of these services is often fragmented across different stakeholders, including central governments, local authorities, and agencies. This means attracting private sector investment is often contingent on the regulatory environment.

We therefore use the World Bank's regulatory quality index which measures the ability of the national government to formulate and implement sound policies and regulations that permit and promote private sector involvement.

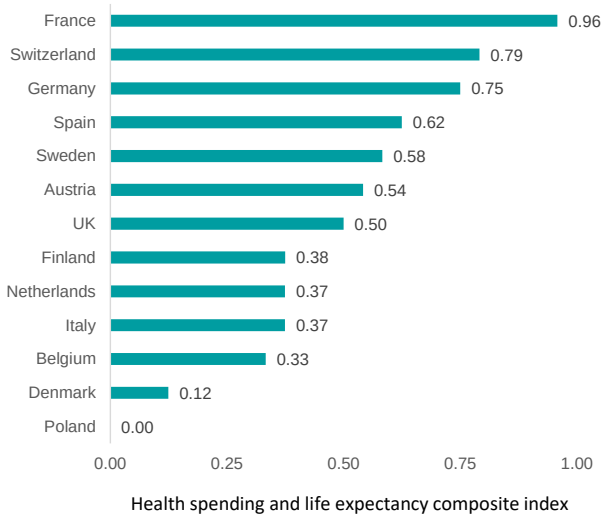
The Nordic region ranks top in terms of a favourable business environment while Italy, Poland and Spain need to take urgent steps to improve the regulatory environment that allows private sector businesses to operate.

Source: World Bank (March 2024).

[55] https://www.eea.europa.eu/en/analysis/indicators/greenhouse-gas-emissions-from-energy
[56] https://energy.ec.europa.eu/topics/energy-efficiency/energy-efficient-buildings/energy-performance-buildings-directive_en

4.11 Healthcare

Health care spending and life expectancy composite index (2022)



Comment

Demographics will place increasing strains on healthcare systems. By 2040, the old age dependency ratio* (OADR) is set to rise across all European countries with the highest dependency ratios in Italy, Spain, France, and Germany. In comparison, relatively lower OADR will prevail in the UK, Sweden, and Poland.

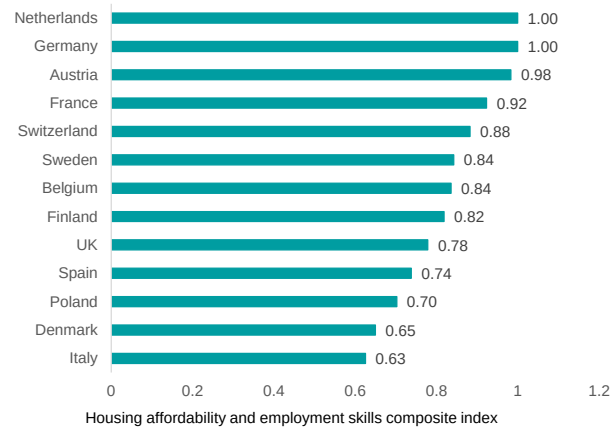
To assess healthcare provision and outcomes, we have created a composite index tracking government spending on health and life expectancy at the age of 60. Results show that Poland not only has a relatively low share of government spending on healthcare, but it also has the lowest life expectancy among our country group. The country therefore ranks last on this metric.

At the other end of the scorecard, France, Switzerland, and Germany are committing higher levels to healthcare spending which is accompanied by longer life expectancies at the age of 60.

*OADR: The number of individuals aged 65 and over per 100 people of working age defined as those aged 15 to 64 years old
Source: Eurostat (March 2024).

4.12 Social

Housing affordability & education and training composite index (2022)



Comment

Our social pillar combines two dimensions: one on housing affordability and the other on education and training.

For housing, we track the share of the population where mortgage payments or rental costs exceed 40% of disposable income. For training and education, we assess progress towards reaching the 60% target of all adults participating in some form of training every year by 2030 as outlined in the European Pillar of Social Rights Action Plan[57].

On this combined metric, the Netherlands and Germany sit at the top of the leader board. Meanwhile, Italy and Denmark rank last suggesting more supportive policy action is required.

Mortgage/rents Figures refer to percentage of people between 25 and 64 years old
Source: Eurostat - adult education survey (AES) (March 2024)

Contributor

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DWS Research Institute

[57] https://op.europa.eu/webpub/empl/european-pillar-of-social-rights/en/

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