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# **Infrastructure endowment in Italy and Spain**

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# Infrastructure and growth

- The medium-term impact of inadequate infrastructure on growth is significant, especially if a country lags behind in developing **essential infrastructure** that complements **private sector investment**.
- A survey by the **European Investment Bank** gathers companies' views on the factors that **hinder their investments**. In many countries, the share of firms citing **energy costs** and **infrastructure shortages** as obstacles is significant:
  - on average, **83% of European companies surveyed mention energy cost as an obstacle to their investments** (80% in Italy and 81% in Spain);
  - **46% of European companies surveyed consider that the transport infrastructure** (51% in Italy and 52% in Spain) hinders their development.

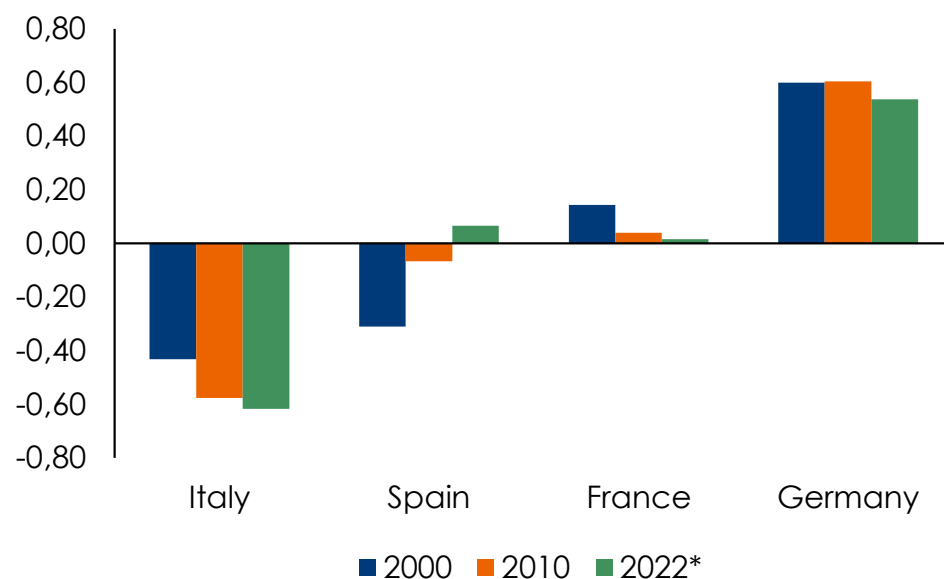
# Infrastructure endowment indicators: Italy's and Spain's positioning

- According to the IMD World Competitiveness Scoreboard summary indicator for infrastructure endowment, in 2023 Spain and Italy rank 27<sup>th</sup> and 30<sup>th</sup>, respectively, out of 63 countries. **Italian and Spanish infrastructural endowments have room for improvement compared to neighbouring and similar economies.** There is a wide gap with Germany and France, which rank 14<sup>th</sup> and 17<sup>th</sup>, respectively.
- The World Bank **Logistics Performance Index** measures the ability of countries to trade goods quickly and reliably and quantifies the international competitiveness of logistics. In the latest 2023 survey, **Italy and Spain are at the bottom of the ranking** of the most advanced economies in terms of quality and quantity of infrastructure, close to France but far behind Germany, which is among the leaders.
- To measure **infrastructure endowment**, we have developed **synthetic indicators** that take into account countries' performance in several economic and social dimensions: **transports, education and healthcare, digitalization, water, waste and energy.**

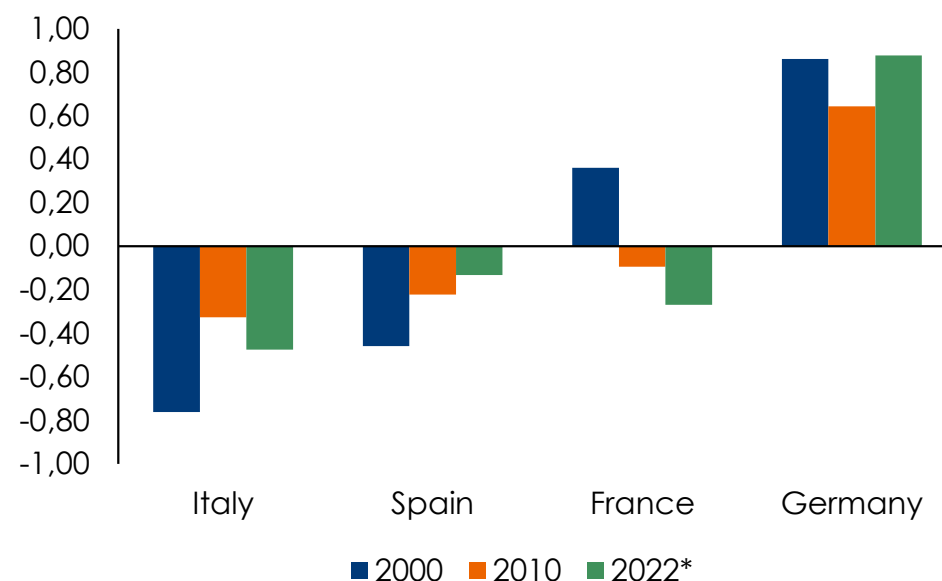
# Transport infrastructures

- **Italy shows a poor endowment**, mainly due to the low volume of public resources allocated to investments.
- **Spain highlights a significant improvement** compared to the early 2000s.

## Road Transport - Synthetic Indicator



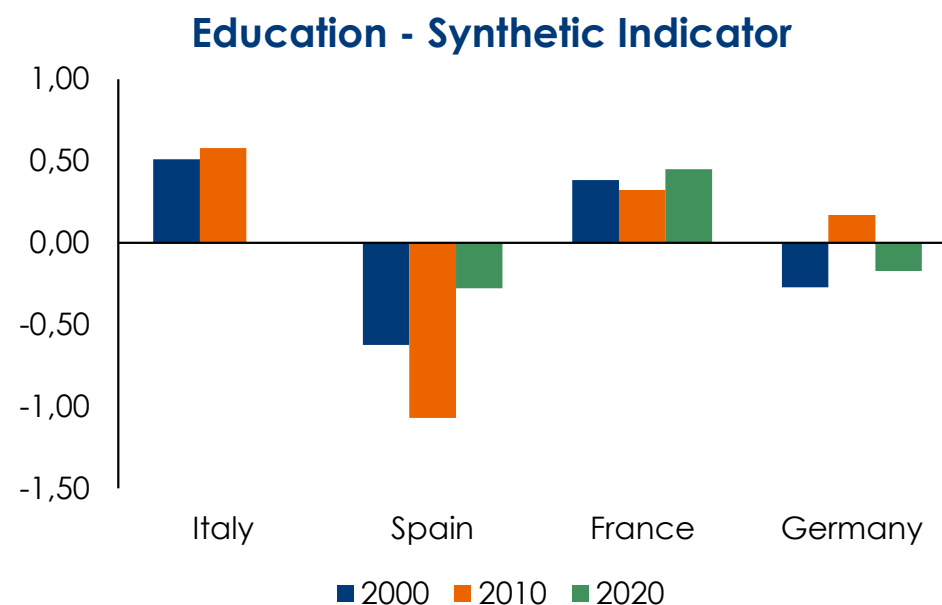
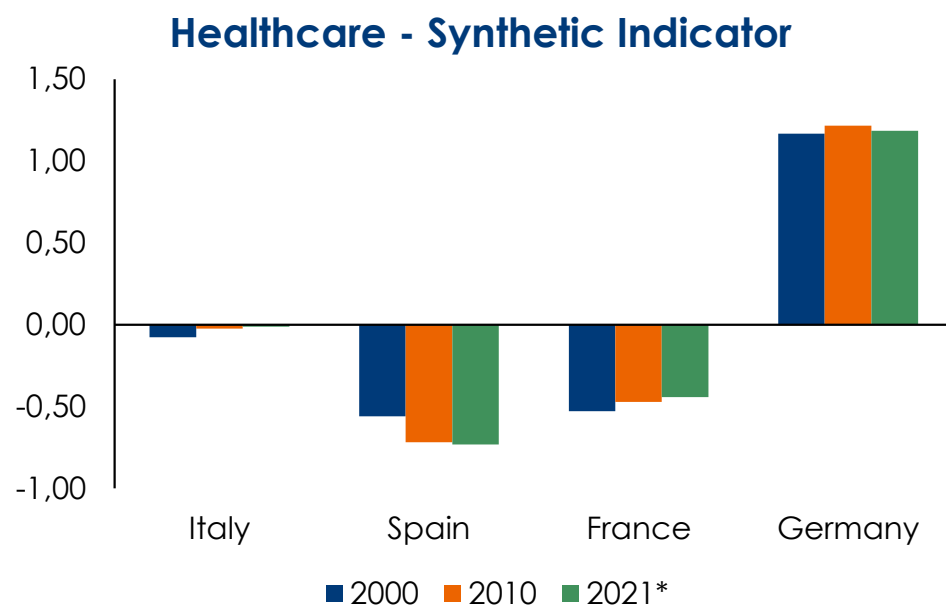
## Other transport - Synthetic indicator



Note: the zero line indicates the average value of the four countries analysed: negative results indicate an under-endowment compared to the average, positive values indicate a better endowment. (\*) Or most recent data, if 2022 data not available. Source: Intesa Sanpaolo and REF Ricerche elaborations.

## Social infrastructures

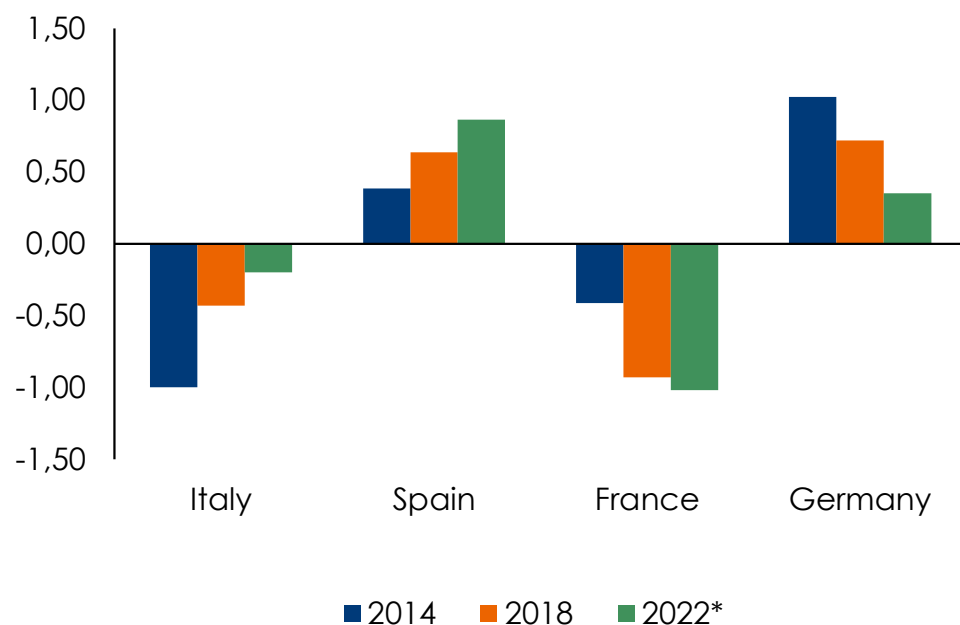
- In Spain, the **health infrastructure** endowment is limited; Italy shows better results but still very low, especially compared to Germany.
- As regards **education**, Italy shows a good **endowment of physical infrastructures but a low level of digitalisation**. The indicator deteriorates sharply in 2020 when digitalisation is considered.



Note: the zero line indicates the average value of the four countries analysed: negative results indicate an under-endowment compared to the average, positive values indicate a better endowment. (\*) Or most recent data, if data for 2021 is not available. Source: Intesa Sanpaolo and REF Ricerche elaborations

# Digital infrastructures

Digital infrastructures - Synthetic indicator

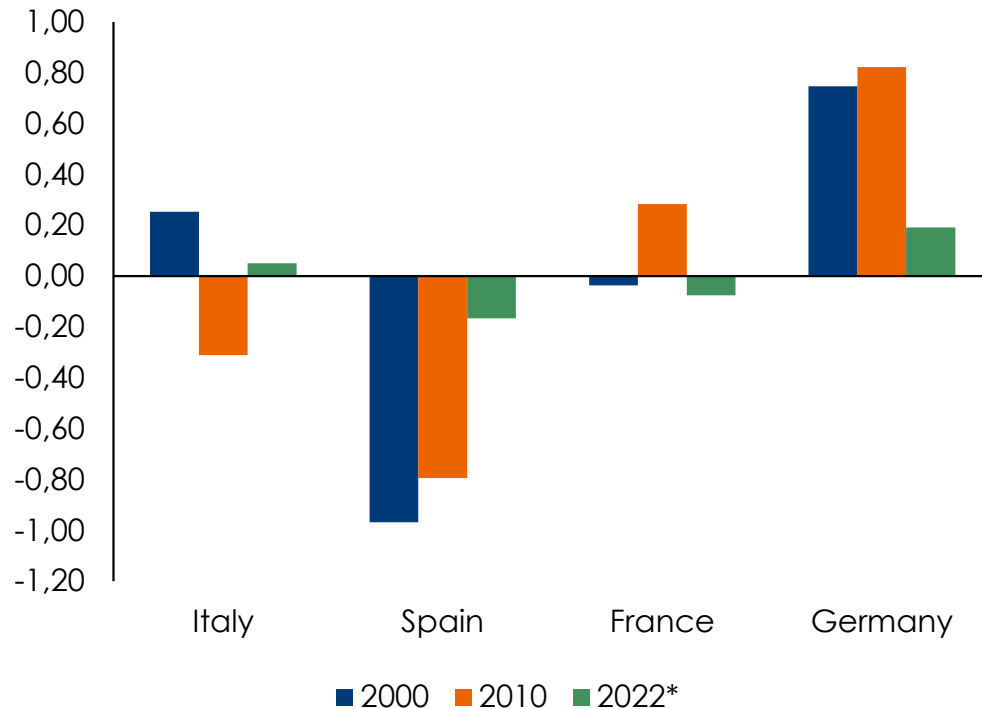


Note: the zero line indicates the average value of the four countries analysed: negative results indicate an under-endowment compared to the average, positive values indicate a better endowment. (\*) Or most recent data, if data for 2022 is not available. Source: Intesa Sanpaolo elaborations

- **Germany** and Spain have achieved the best results in implementing infrastructural development strategies. **Spain has recorded the most significant progress over the period considered.**
- **Italy's performance has also improved significantly:** although still lagging slightly behind, it has made a strong recovery, especially in terms of NGA (Next Generation Access) coverage and speed.

# Water and Waste infrastructures

## Environment - Synthetic indicator

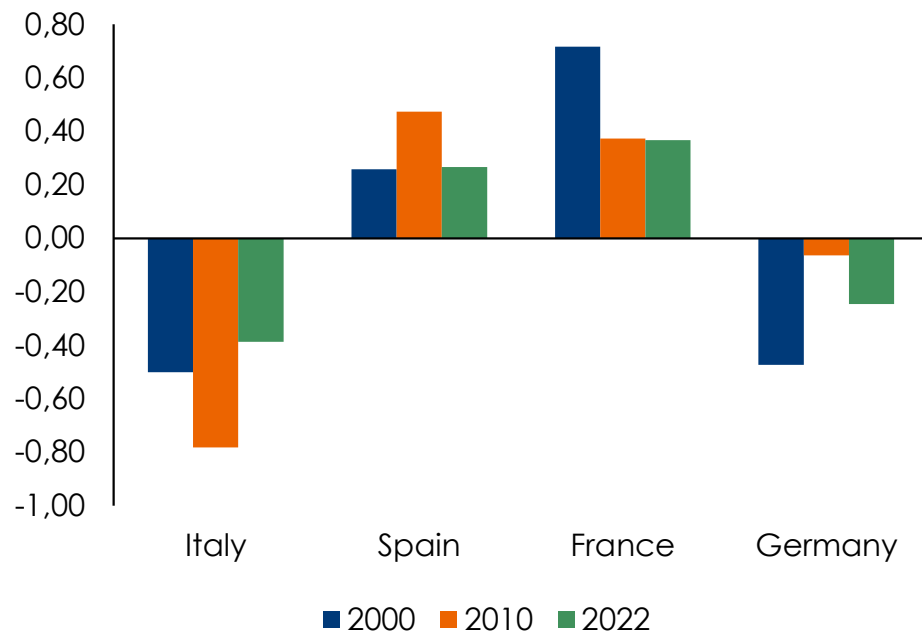


Note: the zero line indicates the average value of the four countries analysed: negative results indicate an under-endowment compared to the average, positive values indicate a better endowment. (\*) Or most recent data, if data for 2022 is not available. Source: Intesa Sanpaolo and Ref. Ricerche elaborations

- Italy and Spain are among European countries with the highest water stress.
- The impact of climate change is worsened by an **inadequate endowment of water infrastructures**.
- Waste management and treatment are key to the circular economy; waste recycling rates in Italy and Spain are relatively high but there is still room for improvement.

# Energy infrastructures

Energy infrastructure- Synthetic indicator



Note: the zero line indicates the average value of the four countries analysed: negative results indicate an under-endowment compared to the average, positive values indicate a better endowment. Source: Intesa Sanpaolo elaborations on Eurostat and Terna

- **Italy and Germany**, the two main manufacturing economies in Europe, **show the worst scores in terms of energy infrastructure.**
- Italy's energy infrastructure lags significantly behind Spain, despite some improvements in recent years.
- Spain scores well, especially thanks to its large efforts to install new renewable capacity.
- France's performance is mainly due to its heavy reliance on nuclear energy.

## An overview of synthetic indicators (2022\*)

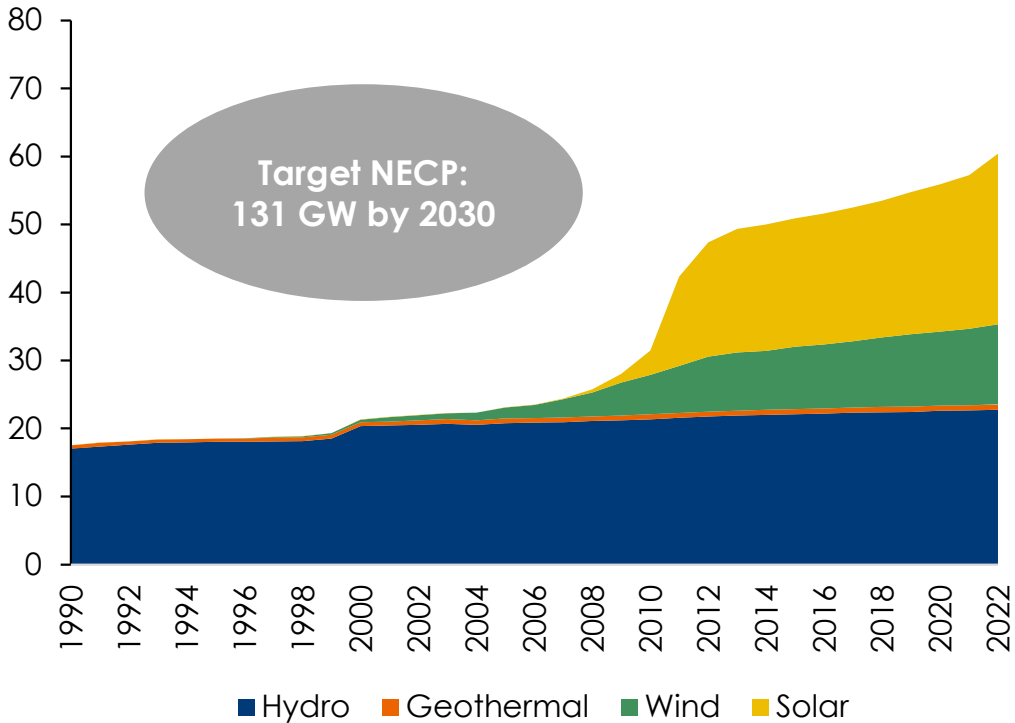
	Italy	Spain	France	Germany
Road Transport	-0,6	0,1	0,0	0,5
Other transport	-0,5	-0,1	-0,3	0,9
Healthcare	0,0	-0,7	-0,4	1,2
Education	0,0	-0,3	0,5	-0,2
Digital infrastructures	-0,2	0,9	-1,0	0,4
Environment	0,1	-0,2	-0,1	0,2
Energy	-0,4	0,3	0,4	-0,2

Note: compared to the four countries' average. (\*) Or most recent data, if data for 2022 is not available.

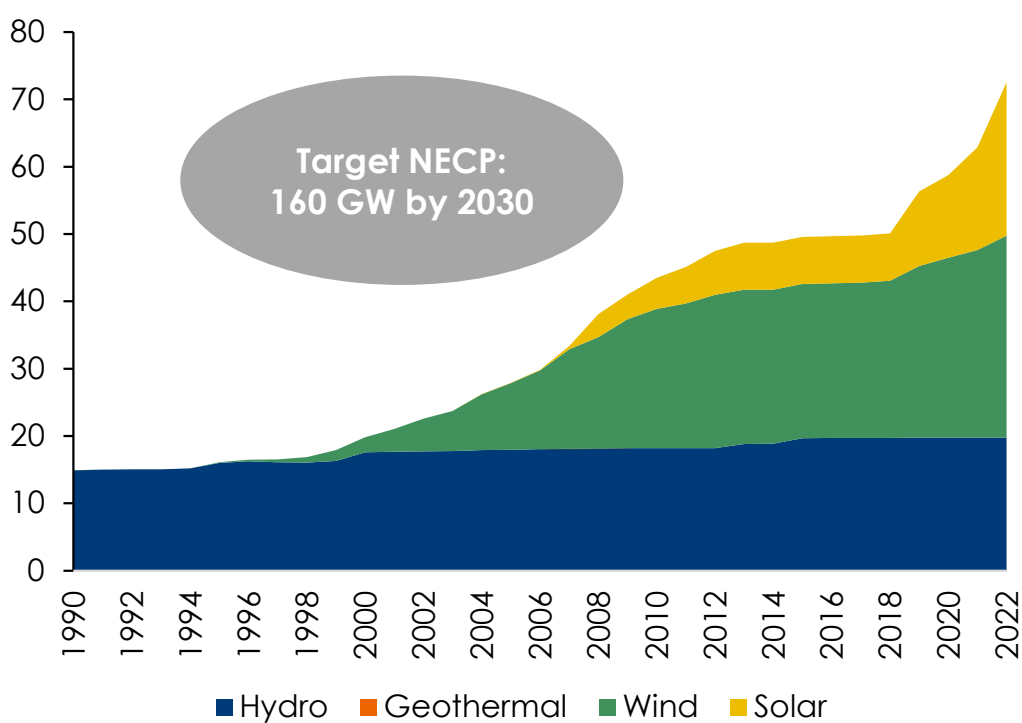
Source: Intesa Sanpaolo elaborations

# Renewable capacity is growing, driven by solar and wind, to meet national energy plans...<sup>9</sup>

**Italy**  
(60 GW as of 2022)



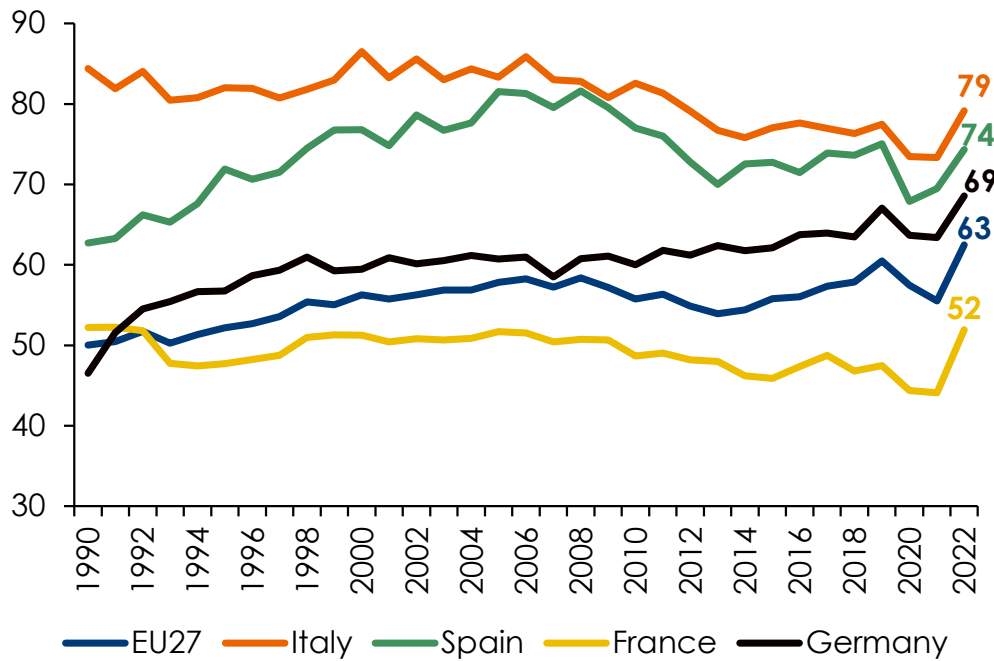
**Spain**  
(72 GW as of 2022)



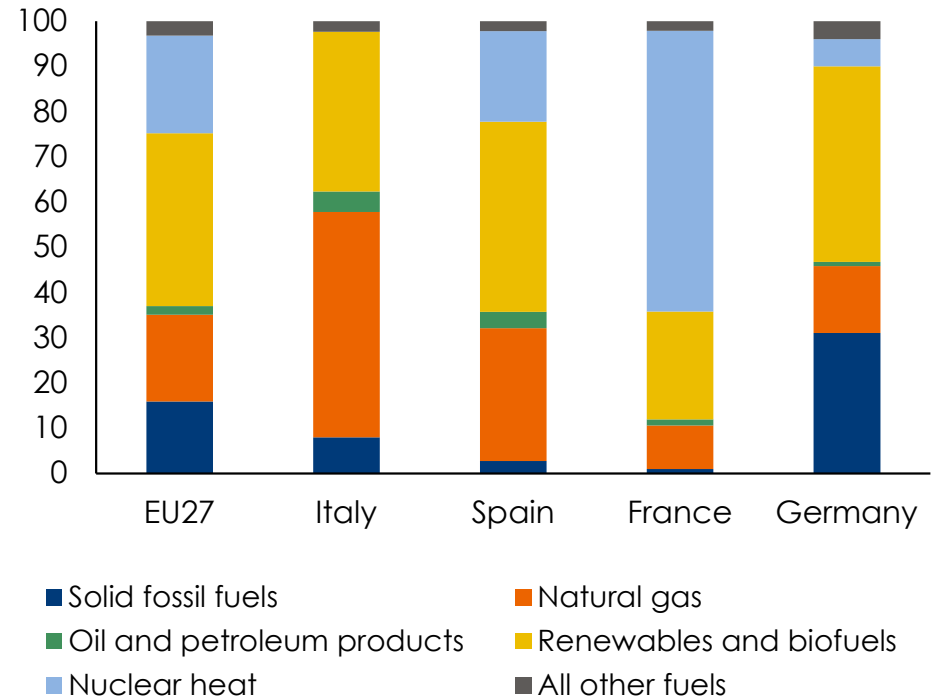
Source: Intesa Sanpaolo elaborations on Eurostat and Terna.

# ...but EU countries suffer from high energy dependence, especially Italy and Spain

**Energy dependency index**  
(% of imported energy in gross available energy)



**Electricity generation by fuel type, 2022**  
(%)



Note: energy dependency index is calculated from the energy balance of various countries, as the ratio between net energy imports and gross domestic energy consumption.  
Source: Intesa Sanpaolo elaborations on Eurostat

# Conclusions

- The provision of adequate **infrastructure is essential** for an economy to grow and create investment and employment opportunities.
- Italy and Spain still have **a large gap to close** in terms of infrastructure, digitalisation and decarbonization.
- The **twin transition** increases the need to invest in new infrastructures and to upgrade the existing ones, that must be sustainable and resilient.
- A new wave of **both public and private investments appears more strategic** than ever to meet these needs. The financial system is a key enabling factor.
- Diversifying energy sources and reducing **dependence on foreign imports** is necessary to preserve the security of energy supplies, cut **energy prices** and thus enhance **industrial competitiveness**.
- The challenges ahead are too great for any single country to meet; geopolitical risk increases and **infrastructures require a high degree of interconnection**. Strong cooperation between EU countries is needed to ensure a successful transition.

# Backup

# Methodological appendix

- The synthetic indicators presented have been calculated as a simple average of the standardised variables that compose it and are illustrated in the following tables.
- The synthetic indicators thus constructed make it possible to describe the evolution of the relative level of each country's endowment compared to the others over time, but not the absolute trend.
- They are therefore to be read as measures of each country's relative advantage/lagging compared to the other major European economies

# Road transport

	Road network density motorways	Road network density other roads	Car density on motorways
	Road length/land cover		Number of vehicles per km
<b>Germany</b>			
2000	32.8	613.4	4.1
2010	35.9	610.3	3.6
2022	36.9	605.9	4.1*
<b>Spain</b>			
2000	17.9	171.2	2.4
2010	28.3	165.9	2.0
2022	31.4*	163.8*	1.9*
<b>France</b>			
2000	18.0	708.1	3.6
2010	20.9	712.4	3.5
2022	21.6	714.6	3.9*
<b>Italy</b>			
2000	21.5	535.1	5.6
2010	22.1	596.5	6.2
2022	23.2*	534.1*	6.4*

Note: (\*) data as of 2021.

Source: Intesa Sanpaolo and REF Ricerche elaborations on Eurostat data, online database

# Other transport

	Railway network length/land cover	High speed railway length/land cover	Thousands of passengers every 100 inhabitants	Railway: transported goods (tons/Gdp)	Passengers per capita	Airport: transported goods (tons/Gdp)	Number of airports every 1,000 km2
	Railway	Railway	Railway	Railway	Airports	Airports	Airports
<b>Germany</b>							
2000	102	1.78	2.53	0.15	1.47	1.25	0.10
2010	106	3.30	2.90	0.15	2.03	1.91	0.09
2022	109	4.40*	3.01	0.11	1.87	1.51	0.47*
<b>Spain</b>							
2000	24	0.93	1.40	0.04	2.72	0.65	0.08
2010	27	4.17	1.21	0.02	3.30	0.60	0.08
2022	32	7.19*	1.17	0.02	4.23	0.76	0.10*
<b>France</b>							
2000	58	2.37	1.52	0.08	1.59	1.01	0.11
2010	56	3.51	1.70	0.05	1.84	0.85	0.12
2022	51	5.03*	1.68	0.04	2.01	0.96	0.11*
<b>Italy</b>							
2000	53	0.79	1.27	0.06	0.71	0.47	0.07
2010	55	2.84	1.42	0.06	1.84	0.58	0.13
2022	56	3.06*	1.17	0.06	2.26	0.63	0.15*

Note: (\*) data as of 2021.

Source: Intesa Sanpaolo and REF Ricerche elaborations on Eurostat data, online database

# Healthcare

	Hospital beds (per 1000 inhabitants)	Acute care beds (per 1000 inhabitants)	Computed tomography scanners (number of devices per 1 million inhabitants)	Magnetic resonance imaging units (number of devices per 1 million inhabitants)	Beds in intensive care
<b>Germany</b>					
2000	9.1	6.8	24.61	14.32	NA
2010	8.3	6.2	32.32	27.04	29.2
2021	7.8	5.8	36.51	35.27	39.5*
<b>Spain</b>					
2000	3.7	2.9	13.90	8.80	NA
2010	3.1	2.5	15.95	11.98	9.7
2021	3.0	2.5	21.44	20.36	9.7*
<b>France</b>					
2000	8.0	4.1	7.01	1.65	NA
2010	6.4	3.5	11.82	6.96	11.6
2021	5.7	3.0	19.55	17.03	16.3*
<b>Italy</b>					
2000	4.7	4.2	21.13	7.76	NA
2010	3.6	3.0	32.17	22.47	12.5
2021	3.1	2.6	38.66	33.19	14.0*

Note: (\*) data as of 2021.

Source: Intesa Sanpaolo and REF Ricerche elaborations on Eurostat data, online database

# Education

	Schools (a)		Digital technologies in schools				
	No. of schools per thousand pupils (primary)	No. of schools per thousand pupils (secondary)	No. of student computers (secondary schools) (b)	Share of students attending (secondary) schools that provide online learning platforms (b)	% of secondary schools with access to computers for educational use (c)	% of students in digitally equipped and connected secondary schools (b)	% of students in (secondary) schools where more than 90% of the digital equipment is operational (b)
<b>Germany</b>							
2000	5.29	2.60	-	-	-	-	-
2010	5.16	2.93	-	-	-	-	-
2020	5.12	2.49	0.14	53.0	98.9	48.0	87.0
<b>Spain</b>							
2000	6.11	2.26	-	-	-	-	-
2010	3.38	1.71	-	-	-	-	-
2020	4.10	1.45	0.33	78.0	100.0	78.0	75.0
<b>France</b>							
2000	9.42	2.32	-	-	-	-	-
2010	8.47	1.99	-	-	-	-	-
2020	8.51	1.98	0.25	86.0	100.0	81.0	74.0
<b>Italy</b>							
2000	6.28	2.90	-	-	-	-	-
2010	5.91	3.27	-	-	-	-	-
2020	6.12	3.25	0.11	58.0	42.9	86.0	69.0

Notes: (a) Eurydice data; (b) EU Commission data; (c) UNESCO data, SDGs Indicator  
Source: REF Ricerche elaborations on various sources

# Environment

	Water exploitation index (a)	Recycling rate of packaging waste (b)
<b>Germany</b>		
2000	7.8	75.9
2010	6.4	72.7
2022	4.9	67.9*
<b>Spain</b>		
2000	9.4	43.6
2010	10.8	61.9
2022	8.9	70.1*
<b>France</b>		
2000	7.3	44.0
2010	2.3	61.1
2022	2.3	61.8*
<b>Italy</b>		
2000	6.7	45.5
2010	9.0	64.4
2022	9.4	72.9*

Notes: (a) Water use index measures total water consumption as a percentage of available renewable water resources for a given territory and period. The average value for the period 2000-2006, 2007-2013 and 2014-2019 is taken into account; (b) % of packaging waste recovered and recycled. (\*) data as of 2021.

Source: Intesa Sanpaolo and REF Ricerche elaborations on Eurostat data

# Energy

	Electrification	Renewable Energy capacity	Energy dependency
	Share of electricity in final energy consumption	Installed electricity capacity by Renewables	% of imported energy in gross available energy
<b>Germany</b>			
2000	0,18	0,14	59,44
2010	0,20	0,37	59,99
2022	0,20	0,61	68,56
<b>Spain</b>			
2000	0,19	0,41	76,80
2010	0,23	0,46	77,00
2022	0,23	0,64	74,35
<b>France</b>			
2000	0,21	0,23	51,28
2010	0,24	0,26	48,67
2022	0,25	0,42	51,92
<b>Italy</b>			
2000	0,18	0,28	86,52
2010	0,20	0,31	82,57
2022	0,22	0,55	79,17

Source: Intesa Sanpaolo elaborations on Eurostat and Terna data

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