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"Energy Transition & Renewables Outlook for Southeast Europe"

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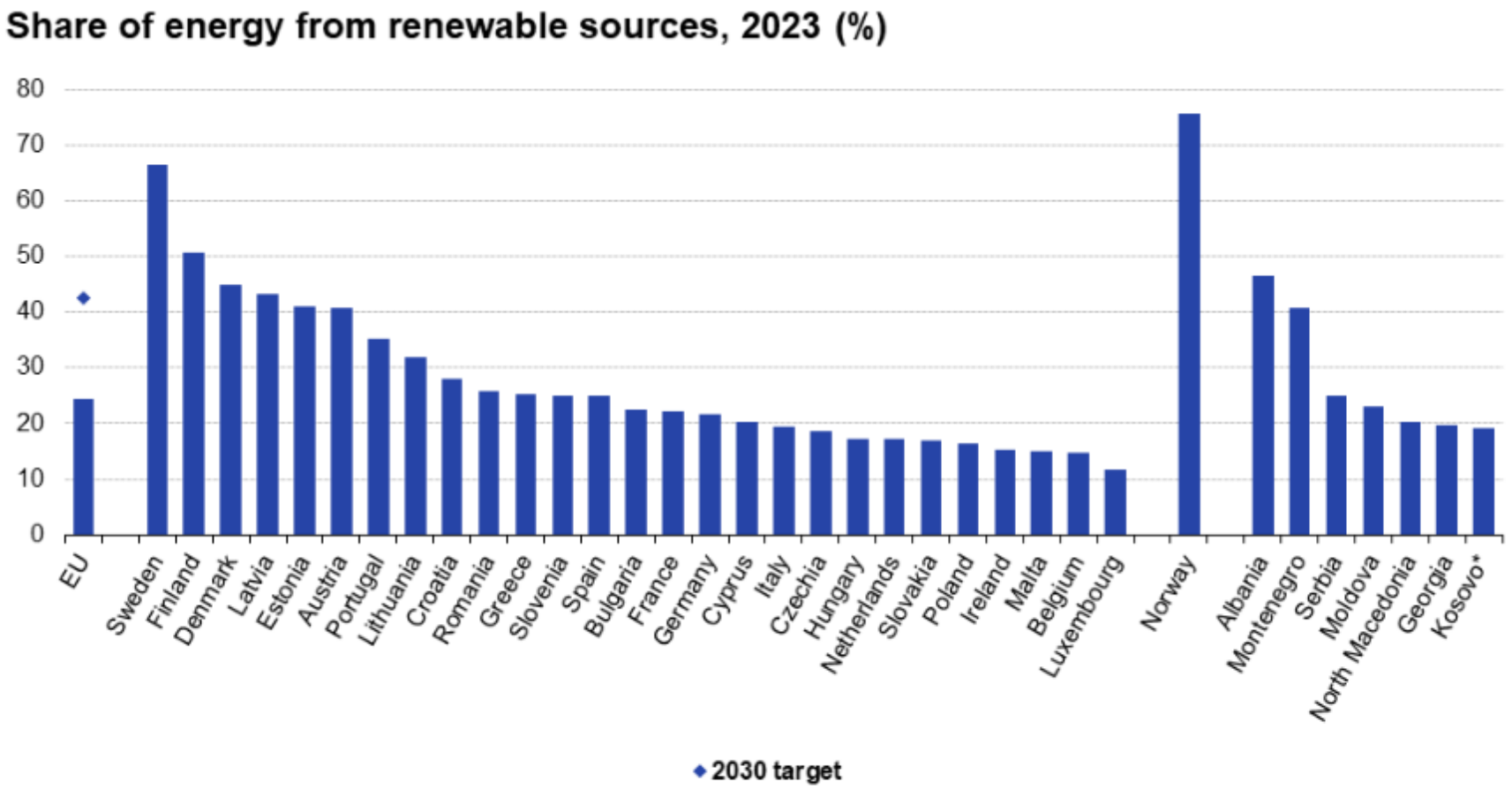
Introductory Remarks

- **European Union renewable energy outlook**
  - Targets, market evolution, key trends and system challenges
- **Southeast Europe energy transition**
  - Regional dynamics, policy direction and market convergence with the EU
- **Key renewable energy technology trends**
  - Solar, wind, hydropower, storage, hybrid systems and digitalization
- **Comparative country performance (2020–2024)**
  - Leaders, laggards and structural strengths and weaknesses
- **Renewable energy financing instruments**
  - Auctions, CfDs, PPAs, green bonds, carbon pricing and emerging tools
- **Strategic conclusions and outlook**
  - System integration challenges and Southeast Europe’s potential as a regional green energy hub

European Union renewable energy outlook

- **The European Union has set a binding target of at least 42.5% renewable energy in total final energy consumption by 2030, with an aspirational goal of reaching 45%.**
- **By 2024, almost 47% of EU electricity generation came from renewable sources; wind and solar combined now produce more electricity than natural gas.**
- **The share of wind and solar in electricity generation increased from 17% in 2019 to 27% in 2023, twice the global average growth rate.**
- **Several Member States (Denmark, Portugal, Austria, Sweden) already generate over 75–85% of their electricity from renewables.**
- **Germany remains the largest RES market in absolute terms, exceeding 120 TWh annually, but faces increasing tension between energy transition costs and industrial competitiveness.**
- **The EU is a global leader in clean energy technology and innovation, particularly in wind turbines, electrolyzers, heat pumps, and offshore wind.**
- **EU targets for 2030 include over 300 GW of wind capacity and nearly 700 GW of solar PV, requiring a doubling of annual installation rates compared to the last decade.**
- **Key system challenges include grid congestion, slow permitting, insufficient storage and interconnections, highlighted by recent grid failures in Iberia.**
- **Over the past five years, more than €500 billion in public funding has been mobilized for RES, matched by comparable private-sector investment.**

Share of energy from RES by country and 2030 target

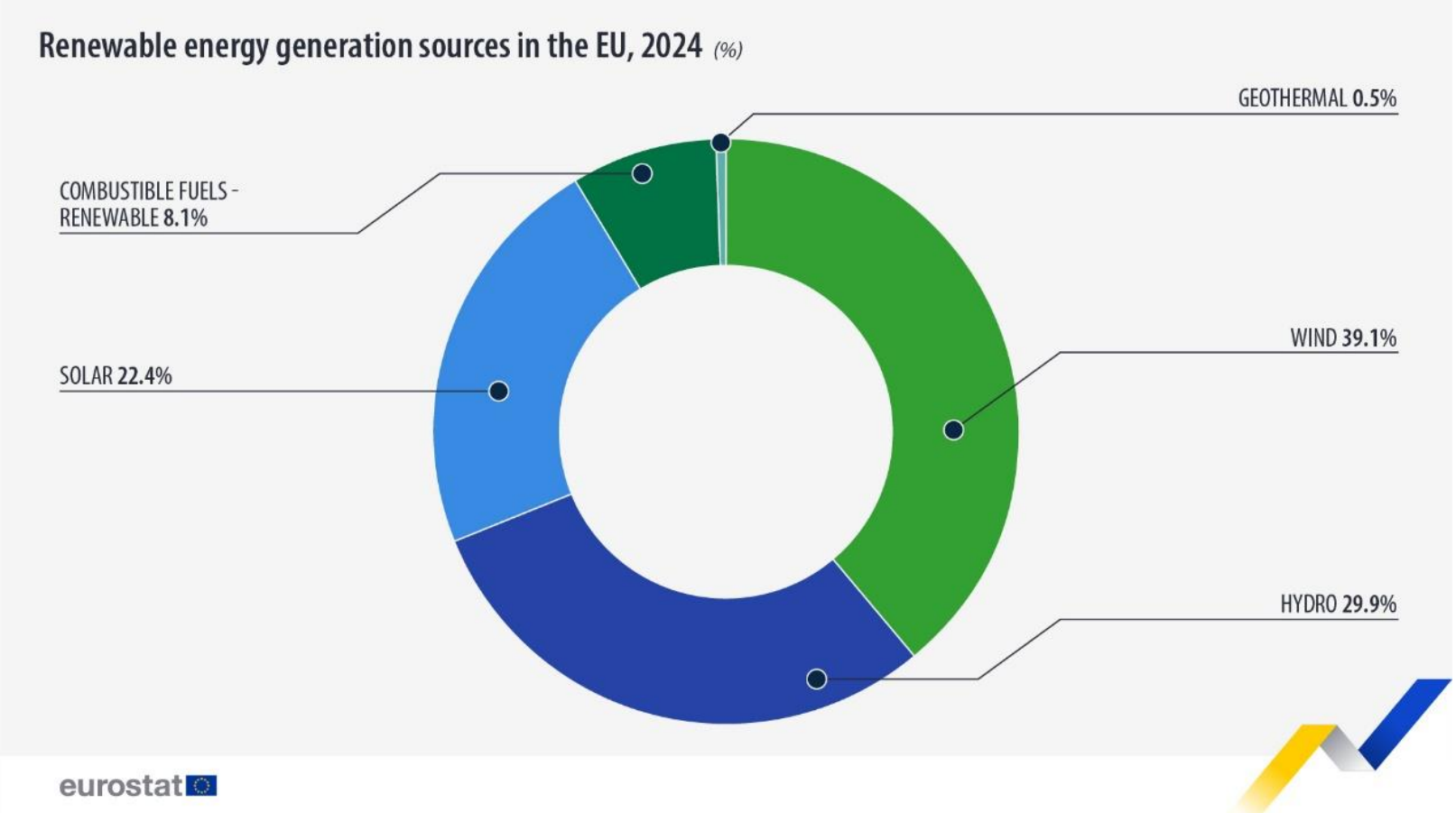


* This designation is without prejudice to positions on status, and is in line with UNSCR 1244/1999 and the ICJ Opinion on the Kosovo declaration of independence.

Source: Eurostat (online data code: nrg_ind_ren)

eurostat

Renewable energy generation in the EU



Southeast Europe energy transition

- **Southeast Europe is undergoing a rapid energy transition, with most countries targeting 30–45% renewables in final energy consumption by 2030.**
- **Regional final energy demand stands at approximately 500–600 TWh per year, with heating and cooling accounting for roughly half.**
- **Bulgaria and Romania exceeded their EU 2020 RES targets well ahead of schedule and maintain strong 2030 ambitions.**
- **In the Western Balkans, hydropower remains dominant (40–50% of electricity), but modernization and diversification are accelerating.**
- **Türkiye is the region's largest energy market:**
  - Around 60% of installed electricity capacity from RES (2024)
  - Strong presence across hydro, wind, solar, and the only significant geothermal capacity in the region.
- **Greece is among the fastest-growing RES markets in Europe:**
  - Around 79% of installed capacity from renewables
  - Rapid solar expansion and advanced legal frameworks for offshore wind and storage.

Cyprus is a global leader in solar thermal energy, though electricity-sector RES penetration remains constrained by system isolation..

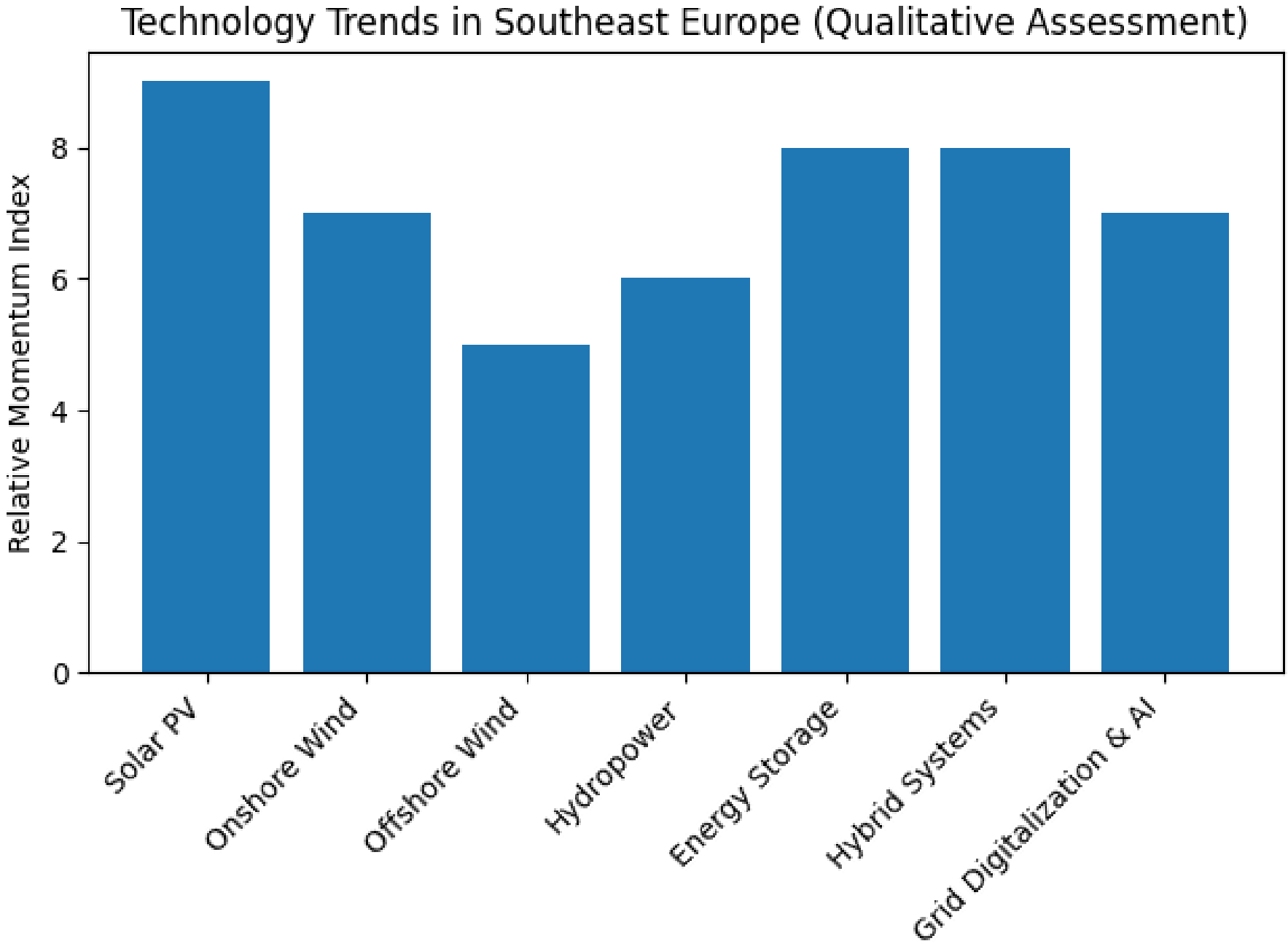
Country	Share of renewable energy in gross final energy consumption (2023 or 2024)	2030 Targets	Comments
Albania	31%	52%	Albania's 52 percent goal signifies a major shift toward diversified renewables—even beyond hydropower
Bosnia & Herzegovina	36,6%	43,6%	aspirations toward 70 percent renewable electricity, 61 percent in heating and cooling, and 8.4 percent in transport
Bulgaria	22.6%	34.1–34.9%	sector-specific goals: about 42% in electricity, 45.5% in heating and cooling, and 15.2% in transport
Croatia	33%	36,4%	The focus now shifts to scaling up wind and solar alongside grid modernization.
Cyprus	20%	33%	The island still trails EU averages, but interconnection project offers hope for structural integration.
Greece	23%	35%	81% renewable electricity, 67% in heating and cooling, and 14% in renewable-based transport.
Kosovo	25%	32%	it will require aggressive deployment of solar, wind, biomass, and distributed energy alongside supporting grid and investment infrastructures
Montenegro	26,3%	50%	This is primarily achievable through hydropower, supplemented by growing solar and wind capacity
North Macedonia	20%	38%	it will require solar, wind, and small hydropower, as well as enhancing heating and transport renewables
Romania	25%	36%	expanding solar PV to 7.3 GW and onshore wind to 7.6 GW by 2030, along with progress in hydro, biomass, and wind sectors.
Serbia	16%	33,6%	As a contracting party to the Energy Community, minimum common targets require it to reach 40.7 percent—but Serbia's plan currently aims for 33.6 percent, with a push to align more closely with the higher threshold.
Türkiye	17%	2035 objective is to achieve approximately 55% of electricity from renewables	Türkiye has not specified a formal 2030 target for overall gross final energy consumption renewables comparable to EU benchmarks.

Renewable Energy Installed Capacity (MW) in SE Europe (2024)

Country	Total Installed Electricity Capacity	Hydro (large, small & pumped)	Wind	PV	Biomass/Bgas/ Waste	Geothermal	Total RES Installed Capacity (2024)	Total RES % (2024)	Comparison: Total RES Installed Capacity (2020)
Albania	2.857	2.600	0	270	1,43	0	2.734	96	2.113
Bosnia & Herzegovina	4.700	2.260	135	382	0	0	2.787	59	2.158
Bulgaria	13.250	3.200	700	3.900	45	0	7.845	59.2	5.065
Croatia	5.500	2.220	870	500	85	16,5	3.691	65	3.101
Cyprus	2.280	0	155	797	12	0	965	42.3	297
Greece	24.500	4.150	5.400	9.600	170	0	19.320	79	10.483
Kosovo	1.540	132	135	10	1,6	0	279	18	120
Montenegro	1.500	700	118	80	2,2	0	900	60	820
North Macedonia	2.060	720	72	506	7	0	1.305	63.4	766
Romania	20.700	6.570	3.000	5.000	134	0	14.704	80	11.153
Serbia	8.500	3.000	600	200	55	0	3.850	45	3.517
Total Without Türkiye	**87.347**	**25.552**	**11.185**	**21.245**	**513,23**	**16,5**	**58.412**	**68**	**39.616**
Türkiye	116.000	32.000	13.000	20.000	2.064	1.700	68.764	60	46.406
Grand Total	**203.147**	**57.552**	**24.185**	**41.245**	**2.577**	**1.716**	**127.266**	63	**85.999**

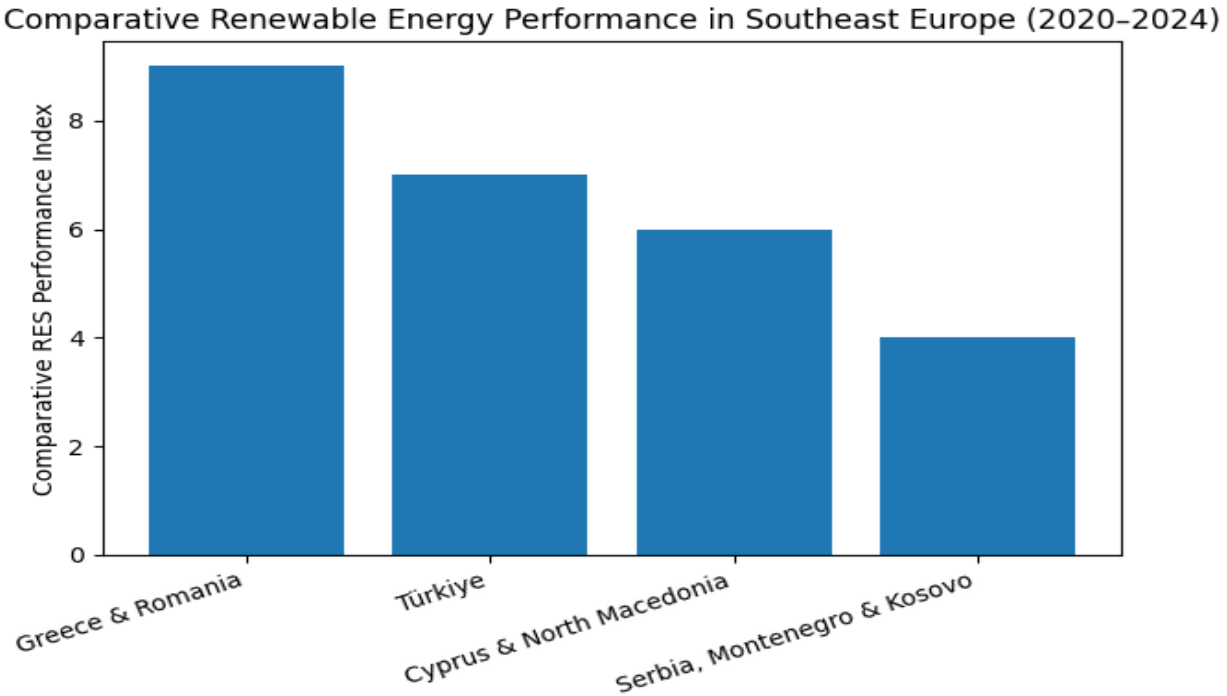
Key renewable energy technology trends

- **Solar PV is the fastest-growing technology (notably in Greece, Türkiye, Romania, Bulgaria, Croatia).**
- **Onshore wind continues to expand steadily; offshore wind is emerging (Greece, Romania, Türkiye).**
- **Hydropower remains the backbone of renewable electricity but is increasingly exposed to climate variability.**
- **Energy storage is gaining momentum, especially pumped hydro (Greece, Romania, Türkiye, Croatia) and batteries.**
- **Hybrid systems (PV + storage, floating PV, hydro + battery) represent the next deployment phase.**
- **Grid digitalization, AI, smart metering, and energy communities are becoming critical enablers.**


Technology Trends in Southeast Europe (Qualitative Assessment)
Relative Momentum Index
0
2
4
6
8
Solar PV
Onshore Wind
Offshore Wind
Hydropower
Energy Storage
Hybrid Systems
Grid Digitalization & AI

Comparative Country Performance (2020–2024)

- **Top performers: Greece and Romania (capacity growth and technology diversification).**
- **Large-scale expansion with lower RES share: Türkiye.**
- **Strong relative growth: Cyprus and North Macedonia.**
- **Lagging progress: Serbia, Montenegro, Kosovo.Structural**
- **weakness: heavy dependence on hydropower and underdeveloped biomass and geothermal sectors across most countries.**

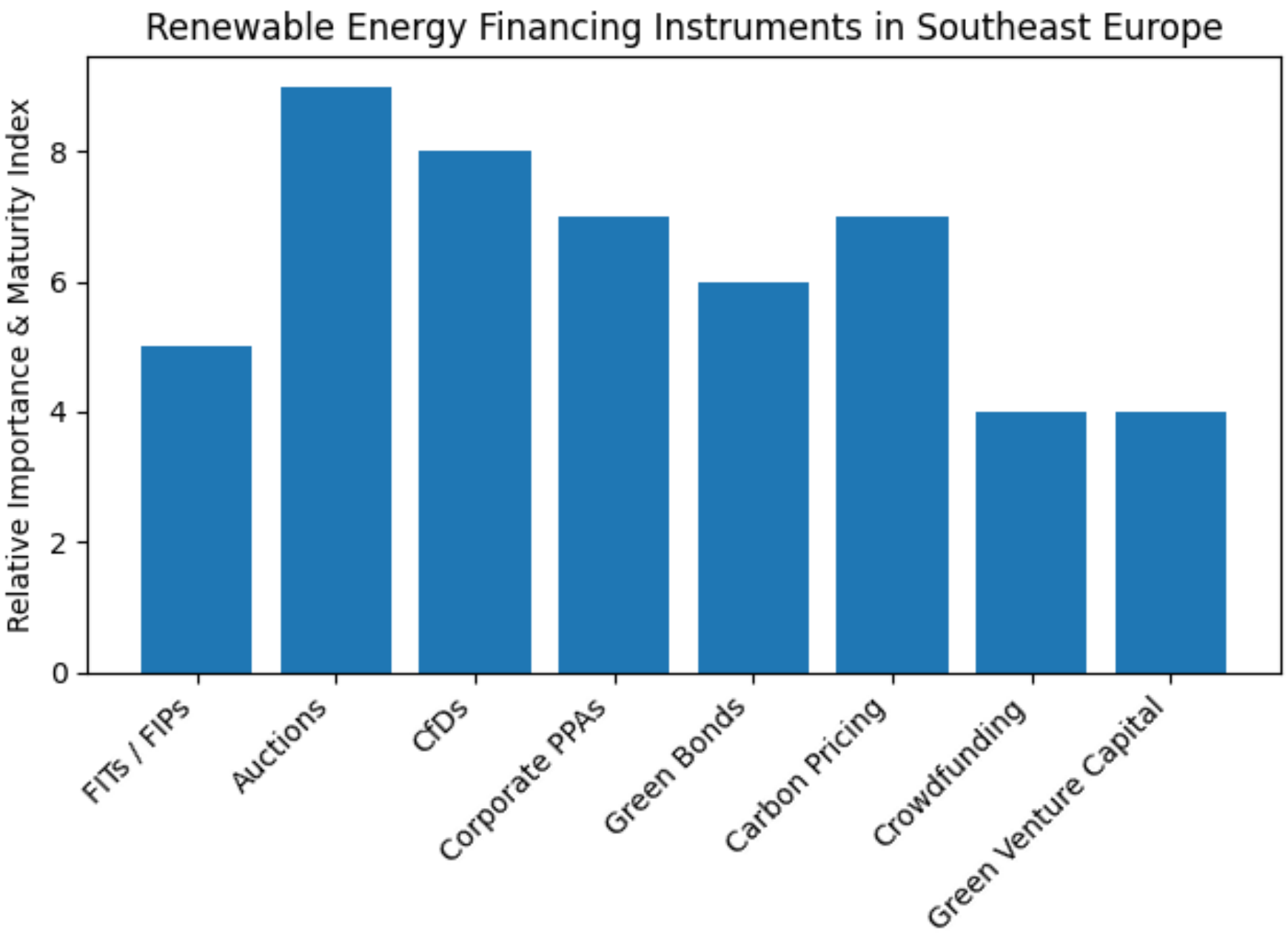


Renewable energy financing instruments (1)

- Renewable energy financing in Southeast Europe has evolved rapidly over the past decade, moving from heavily state-driven support schemes toward a more diversified mix of policy instruments, market-based tools, and private capital, with effectiveness strongly shaped by national regulatory stability, institutional capacity, and market maturity.
- Feed-in Tariffs (FITs) and Feed-in Premiums (FIPs) played a critical early role in kick-starting renewable deployment (notably in Türkiye, Romania, and Bulgaria), but high fiscal costs and retroactive policy changes undermined investor confidence, accelerating the transition toward competitive auctions and market-aligned mechanisms.
- Renewable energy auctions have become the dominant deployment tool across the region since the late 2010s, offering cost efficiency, transparency, scalability, and strong alignment with EU funding instruments, while Contracts for Difference (CfDs) are emerging as the next-generation risk mitigation tool, balancing investor certainty with market price signals.
- Corporate Power Purchase Agreements (PPAs) represent one of the most dynamic and promising financing frontiers, signaling growing market maturity and reduced reliance on subsidies; however, their expansion remains uneven due to constraints such as grid access limitations, currency risk, weak contract enforcement, lack of hedging instruments, and limited creditworthy off-takers, especially in the Western Balkans.
- Green bonds are still at an early stage of development in Southeast Europe, with Greece, Türkiye, and Romania showing the most progress; underdeveloped capital markets, weak green taxonomies, limited investor depth, and high transaction costs continue to constrain broader uptake, despite strong potential to mobilize large-scale private capital.

Renewable energy financing instruments (2)

- Carbon pricing mechanisms, whether through the EU Emissions Trading System or emerging national schemes, are increasingly important as indirect funding tools for renewables, grids, and storage; while EU member states already benefit from ETS-derived revenues, non-EU countries face political and social barriers but are under growing pressure from CBAM to adopt carbon pricing frameworks.
- Crowdfunding and community finance remain marginal but promising, particularly for small-scale and distributed renewable projects, offering a pathway toward energy democratization; regulatory uncertainty, low financial literacy, and limited platform availability currently restrict scalability.
- Green venture capital is underdeveloped but strategically important for financing innovation in renewables, storage, digital energy, and climate tech; the ecosystem remains shallow due to risk aversion, lack of specialized funds, and limited exit opportunities, highlighting the need for blended finance and public-backed VC mechanisms.
- Overall, Southeast Europe's renewable financing landscape is diversifying but still fragmented, with auctions, CfDs, PPAs, green bonds, and emerging private finance tools increasingly complementary; unlocking their full potential will require regulatory clarity, risk mitigation instruments, judicial reliability, market transparency, and stronger regional coordination.


Renewable Energy Financing Instruments in Southeast Europe
Relative Importance & Maturity Index
0
2
4
6
8
FITs / FIPs
Auctions
CfDs
Corporate PPAs
Green Bonds
Carbon Pricing
Crowdfunding
Green Venture Capital

Conclusions and outlook

- **Southeast Europe is rapidly converging with average EU renewable performance, with some countries already exceeding it.**
- **The core challenge is shifting from capacity deployment to:Grid reinforcement and interconnections**
- **Energy storage and flexibility**
- **Market design, social acceptance, and energy democratization**
- **With its diversified resource base, Southeast Europe has strong potential to evolve into a regional green energy hub.**

Thank you for your attention!

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