



***Official Presentation of the “SEE Energy Outlook 2025/2026”
Chamber of Commerce and Industry of Serbia (CCIS), Thursday 1st October 2026***

“Energy Transition & Renewables Outlook for Southeast Europe”

Nicholas Sofianos, General Secretary of IENE
Chairman of the RES Committee

Introductory Remarks

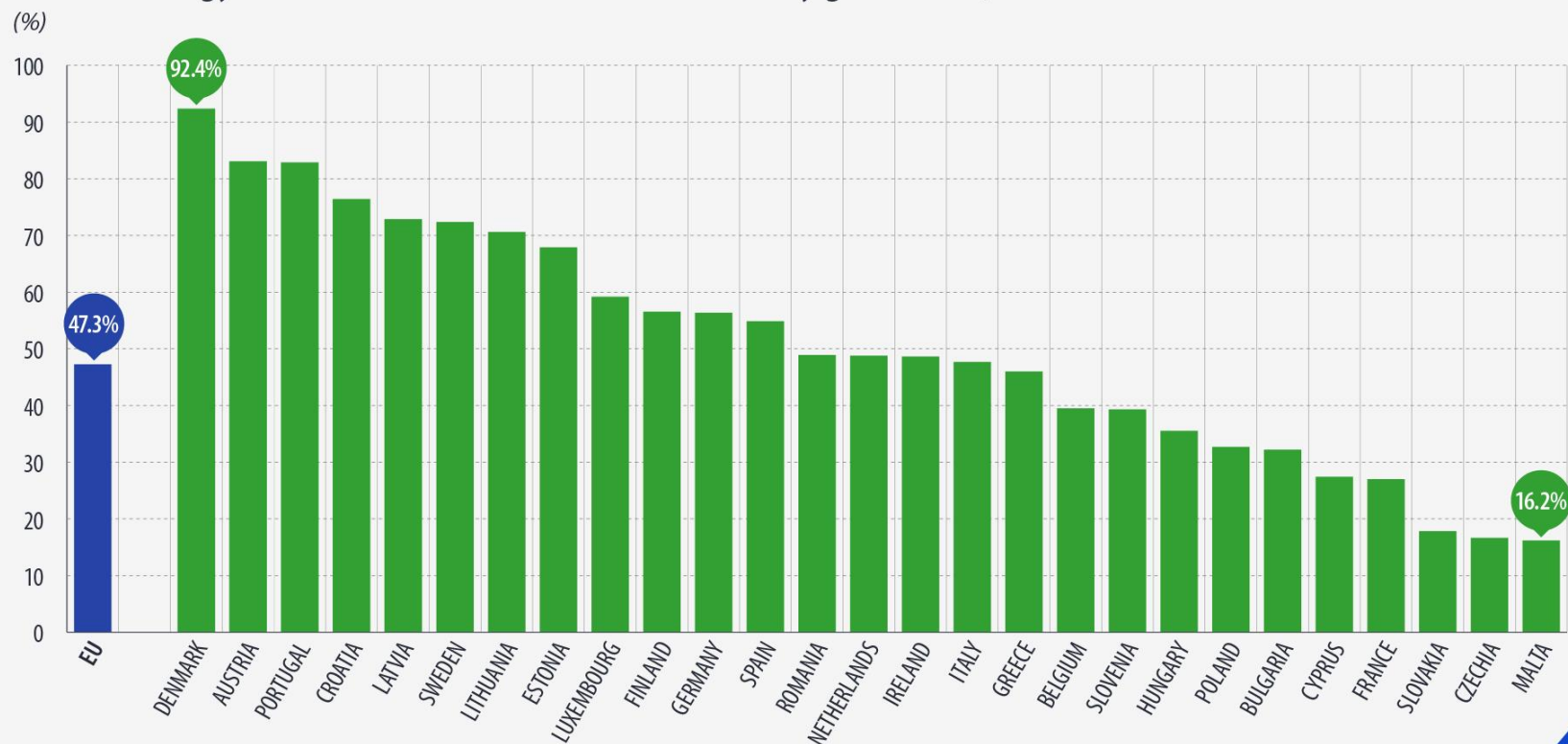
- ❑ **European Union renewable energy outlook**
 - ❑ Targets, market evolution, key trends and system challenges
- ❑ **Southeast Europe energy transition**
 - ❑ Regional dynamics, policy direction and market convergence with the EU
 - ❑ Serbia RES profile
- ❑ **Key renewable energy technology trends**
 - ❑ Solar, wind, hydropower, storage, hybrid systems and digitalization
- ❑ **How Much Are Renewables to Blame for Rising Electricity Prices?**
 - ❑ The Glasses Problem
 - ❑ An integrated regional system
- ❑ **Renewable energy financing instruments**
 - ❑ Auctions, CfDs, PPAs, green bonds, carbon pricing and emerging tools
- ❑ **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 (2025)

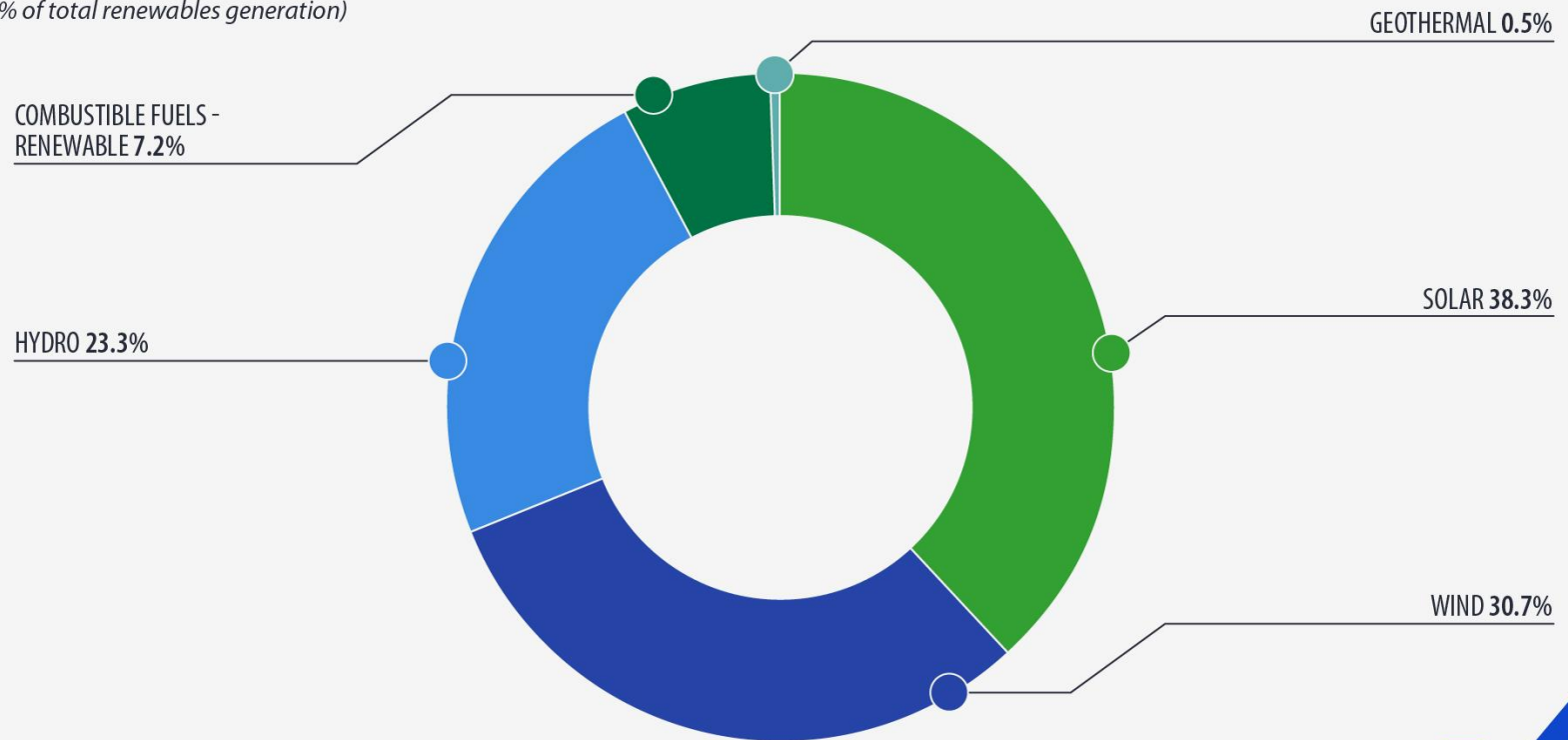
Share of energy from renewable sources in net electricity generation, 2025



Renewable energy generation in the EU

Renewable energy generation sources in the EU, Q3 2025

(% of total renewables generation)



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.

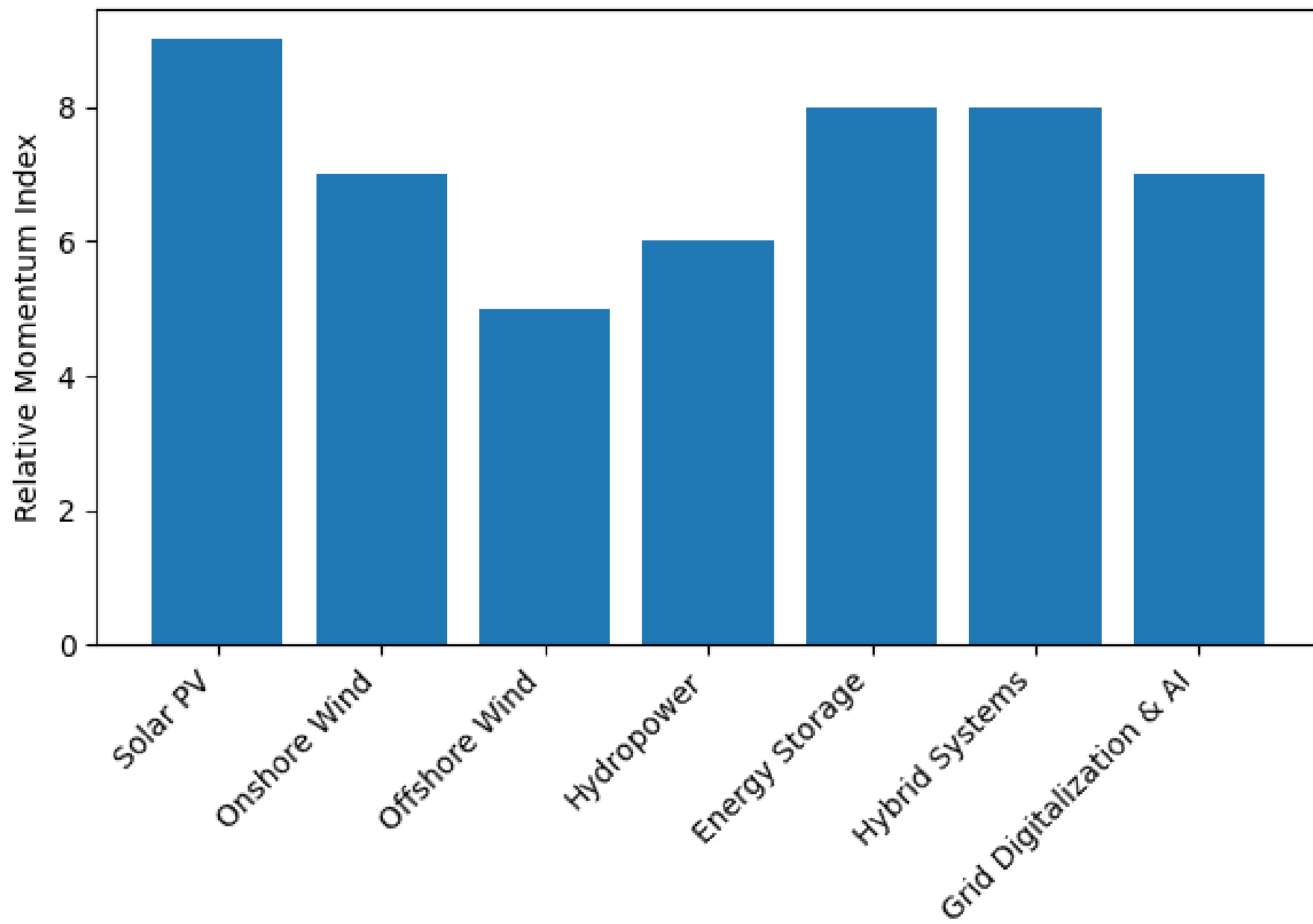
Cyprus is a global leader in solar thermal energy, though electricity-sector RES penetration remains constrained by system isolation..

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 <u>trails</u> 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

Technology Trends in Southeast Europe (Qualitative Assessment)



Serbia – Renewable Energy Snapshot 2026

Technology	Current situation	Key message
Solar PV	> 400 MW operational in 2026	Very rapid growth from only ~13 MW four years ago
Wind	~ 824 MW operational; >200 MW under construction	Serbia is approaching 1 GW of wind
Biomass / Biogas	~ 55 MW in 2025	Still a relatively small part of the RES mix
Hydropower	~ 3.1 GW including pumped storage	Still the backbone of Serbian renewables
Battery storage	> 1 GW in development / connection pipeline	Strong pipeline, but very little large-scale battery capacity actually operational
Solar + Wind	> 1.3 GW combined in 2026	Rapid transition toward variable RES

The Main Problems Serbia Faces

- 1. Grid integration and connection capacity**
- 2. High dependence on coal and hydro**
- 3. Hydrological and climate risk**
- 4. Need for flexibility and balancing markets**
- 5. Regulatory and investment execution**

How Much Are Renewables to Blame for Rising Electricity Prices? The Glasses Problem



1. MIDDAY – RENEWABLE SURPLUS

High solar and wind generation → low prices



Low marginal cost renewables set low daytime prices in many countries.

2. EVENING – RENEWABLE DROP

Solar falls, demand rises → need for flexible generation



Renewables decline at the same time across the region, so all countries need flexible generation → higher evening prices.

THE “GLASSES” PROBLEM

Interconnectors can move electricity from full glasses to empty glasses – but only if there is surplus somewhere in higher evening prices.

SOME COUNTRIES HAVE SURPLUS, OTHERS HAVE SHORTAGE

Interconnections help balance the region.



WHEN ALL COUNTRIES FACE SHORTAGE AT THE SAME TIME

Interconnections cannot create electricity.



More renewables lower average and daytime prices, but their variability – combined with limited flexibility and simultaneous shortages across the region – leads to higher evening prices and greater price volatility.

Is the glass genuinely empty — or does someone have an incentive to make it look emptier than it really was?



Was the glass genuinely empty — or did someone have an **incentive** to make it look emptier than it really was?

From the “Glasses Problem” to a Regional Flexibility System

1. GENERATE	2. STORE & SHIFT	3. BALANCE REGIONALLY
 Solar	 Batteries	 Interconnections
 Wind	 Pumped Hydro	 Regional Grid
Renewable surplus	Time-shifting	Cross-border balancing
↓	↓	↓
Lower prices	Lower price peaks	Price convergence

REGIONAL FLEXIBILITY SYSTEM

Coordinated TSOs • Flow-based capacity allocation • Market coupling • Coordinated outages • Stronger interconnections • Non-EU integration

MORE RENEWABLES REQUIRE A MORE INTEGRATED REGIONAL SYSTEM

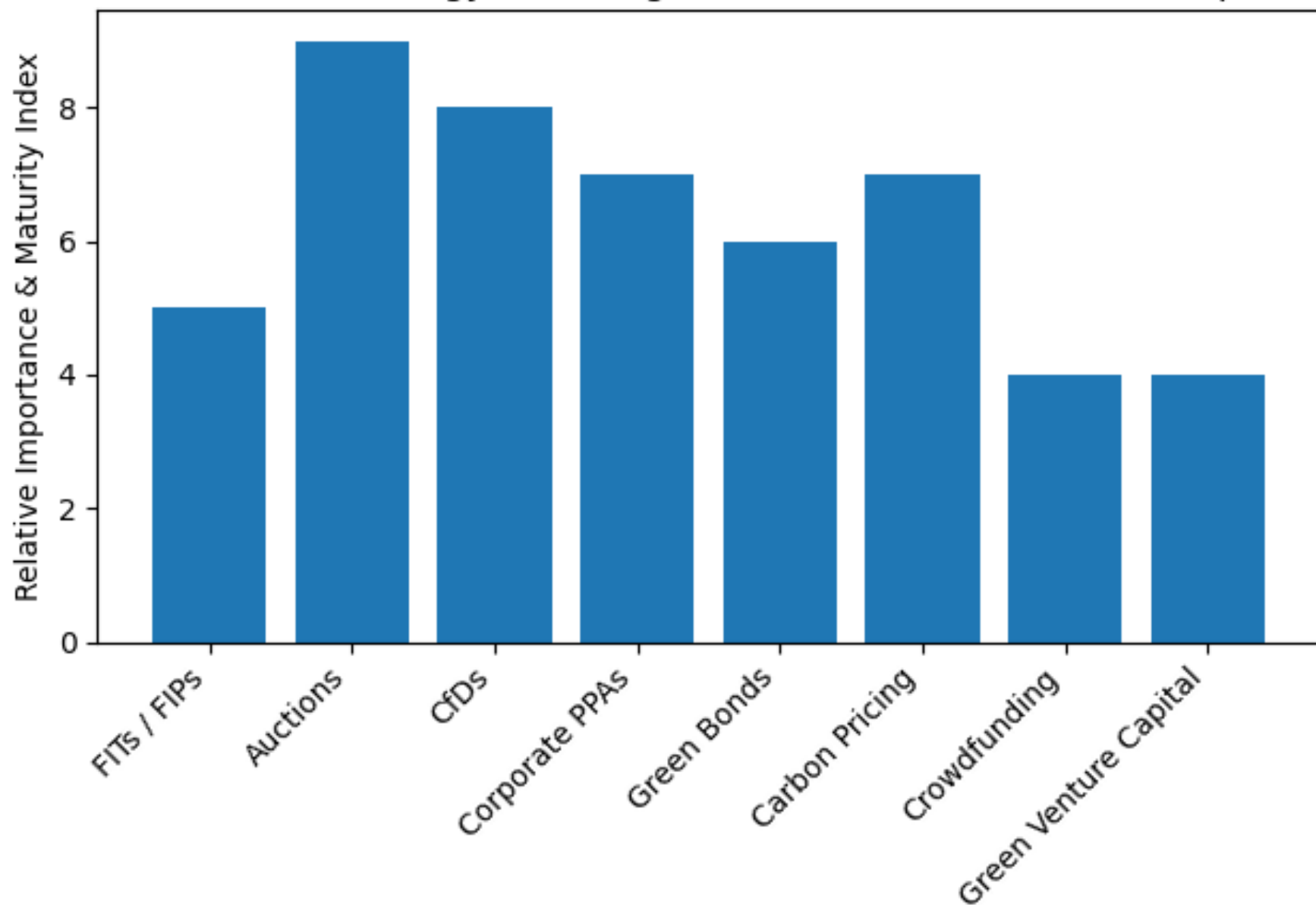
Renewable energy financing instruments (1)

- ❑ 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



Conclusions and outlook

- ❑ **Southeast Europe is rapidly converging with EU renewable performance, with some countries already exceeding EU benchmarks.**
- ❑ **The next challenge is shifting from capacity deployment to system integration:**
 - Stronger grids and cross-border interconnections
 - Energy storage and flexibility
 - Better market design and regional coordination
 - Greater social acceptance and energy democratization
- ❑ **Renewable growth is also reshaping electricity prices, increasing the need to manage volatility and the “glasses problem.”**
- ❑ **Financing is evolving from subsidies towards more market-based instruments, including auctions, CfDs, PPAs and green finance**

Thank you for your attention!

Nicholas Sofianos

General Secretary of IENE



n_sofianos@yahoo.gr



+30 6982846346