

The Potential for Sustainable Biomass in the Romanian Energy Sector

Project financed through the Fund for Bilateral Relations in the EEA/ Norway Financial Mechanism 2014 - 2021.

Project's objectives



analyze the **options** available at national level to **reduce the country's GHG emissions** from fossil fuel energy sources and to **improve the performance of existing thermal and cogeneration plants**



identify the high-potential **towns and cities** for introducing modern **heating solutions**



perform a **case study** for a coal to biomass industrial transformation process at **Paroșeni** power plant



analyze the current state of the **biomass market** in Romania



present to relevant Romanian stakeholders best practices and case studies from **Norway** on using sustainable **biomass** and especially on using **black pellets** as an alternative to coal



disseminate the results of our multidisciplinary research in **scientific journals** and through tailored **communication** channels with relevant stakeholders and the public at large



co-create together with **relevant stakeholders** a mapping of the **biomass legislative and regulatory landscape** in Romania



perform a complex analysis on the **market feasibility** (including aspects related to **regulation, certification** and **value chain analysis**) of introducing sustainable biomass technologies, especially black pellets, in the Romanian energy sector

Pathways for Energy Market Decarbonization

Net Zero is still within reach

Key policies and business milestones to be rechead

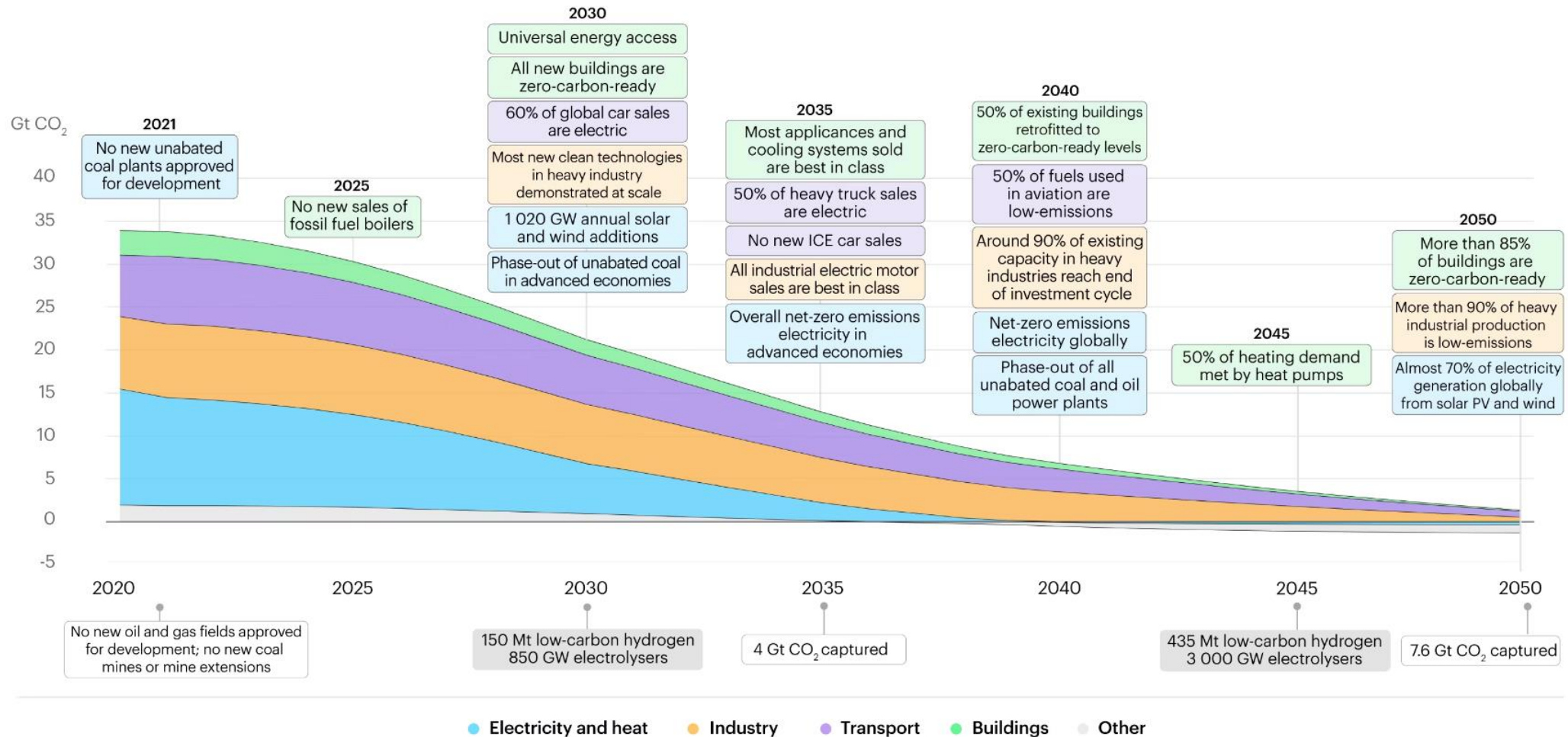


Figure 1 International Energy Agency: Net-zero actions for 2050

Romania's Energy Context

- Relatively balanced Energy Trilemma, with key challenges on environmental policy and affordability

Security of supply

- + much better context than most CEE members states, (having both mineral resources and natural potential)
- + electricity generation park is a relatively stable and balanced one.
- increasing age of large baseload electricity generators (e.g. hydro and coal)
- relatively poor cross-border interconnection with neighboring countries
- systemic energy efficiency steps have not been made

Environmental sustainability

- + it has improved – with the increase of renewable capacities, over the last years
- + the country's natural potential – both onshore and offshore – offers significant room for investments in the years to come.
- the Romanian energy sector still significantly relies on fossil fuel generation.

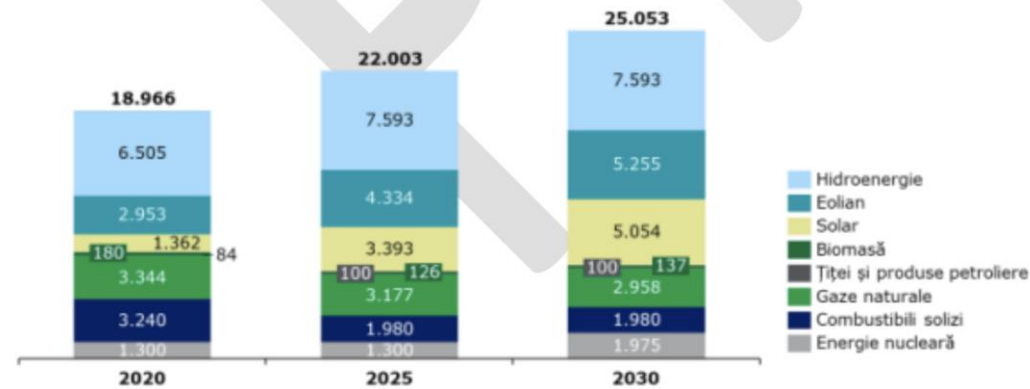
Energy affordability

- this vector has always raised challenges for Romanian governments.
- it does even more so today, as the EU energy prices have increased, because of the Russia-Ukraine conflict, in 2022.
- lack of country-wide energy efficiency actions
- poor understanding of vulnerability statuses and their evolution
- poorly dimensioned and somewhat untargeted financial support
- general lack of non-financial tools

Romania's Energy System - Pathways to decarbonization

- Romania's Energy Strategy 2022-2030, with the 2050 perspective (also included in Romania's NECP)

Traiectoria orientativă a capacității nete instalate, pe surse, [MW]

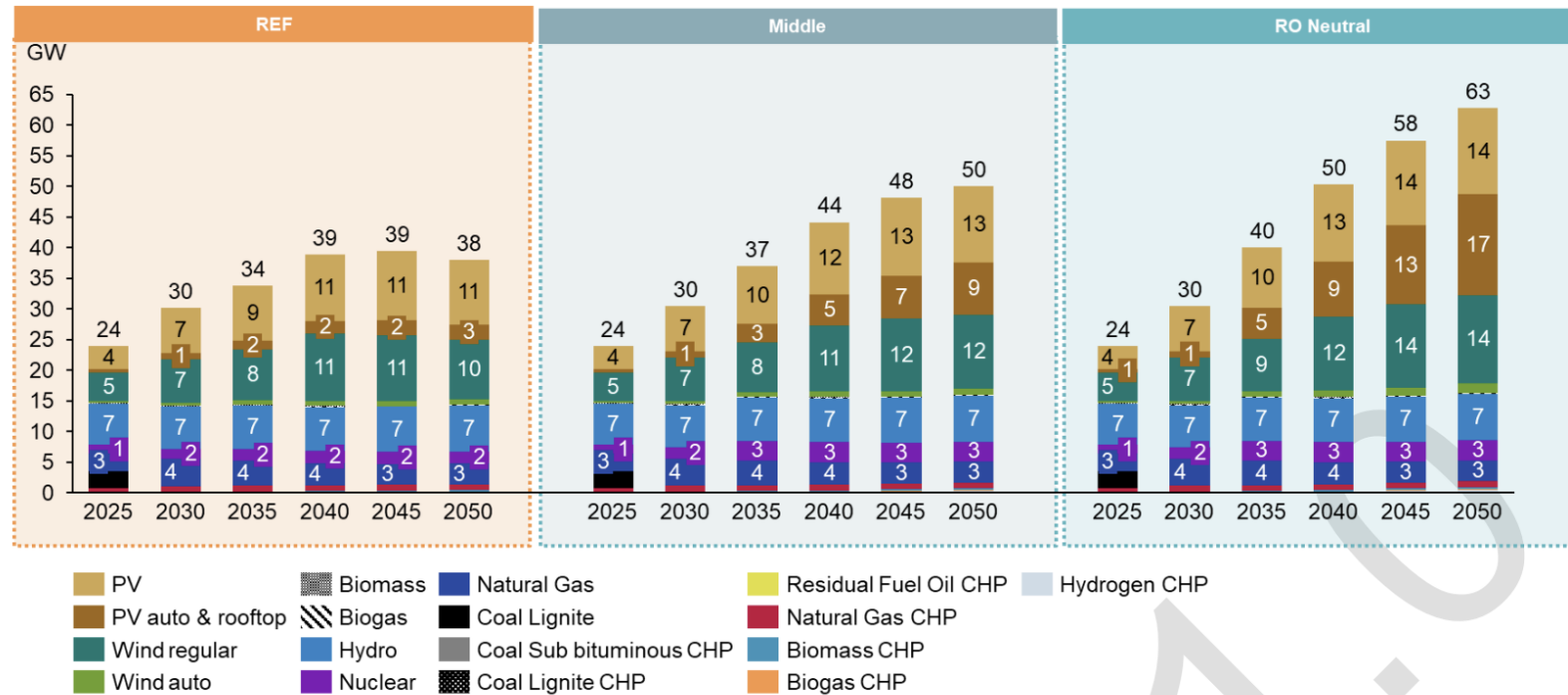


Sursă: Calcule Deloitte pe baza informațiilor transmise de Grupul de lucru interinstituțional PNIESC și a recomandărilor COM

Romania's Energy System - Pathways to decarbonization

- Romania's Long Term Strategy of Romania

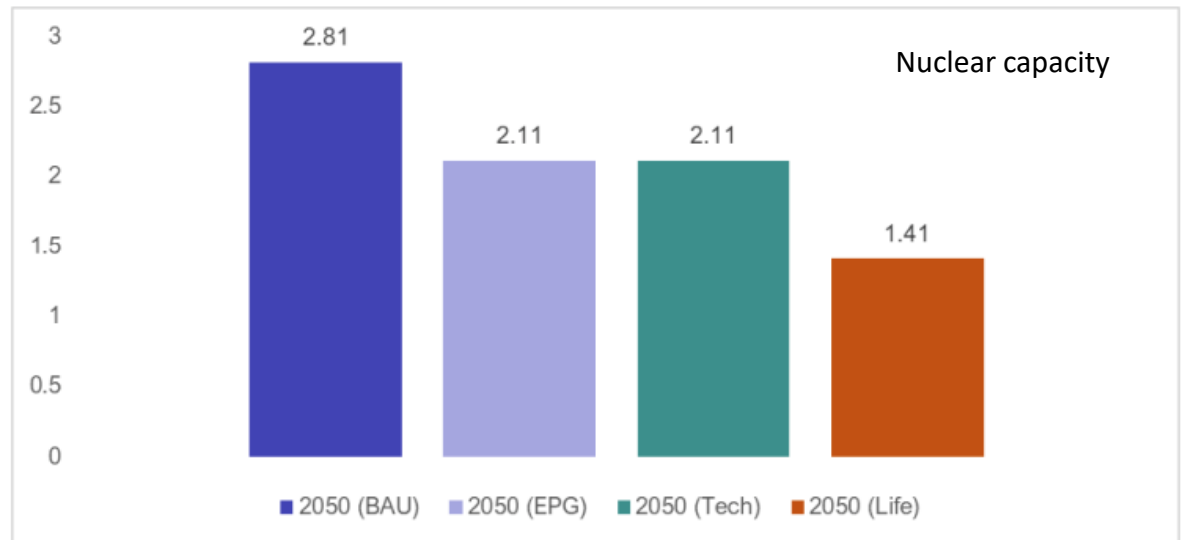
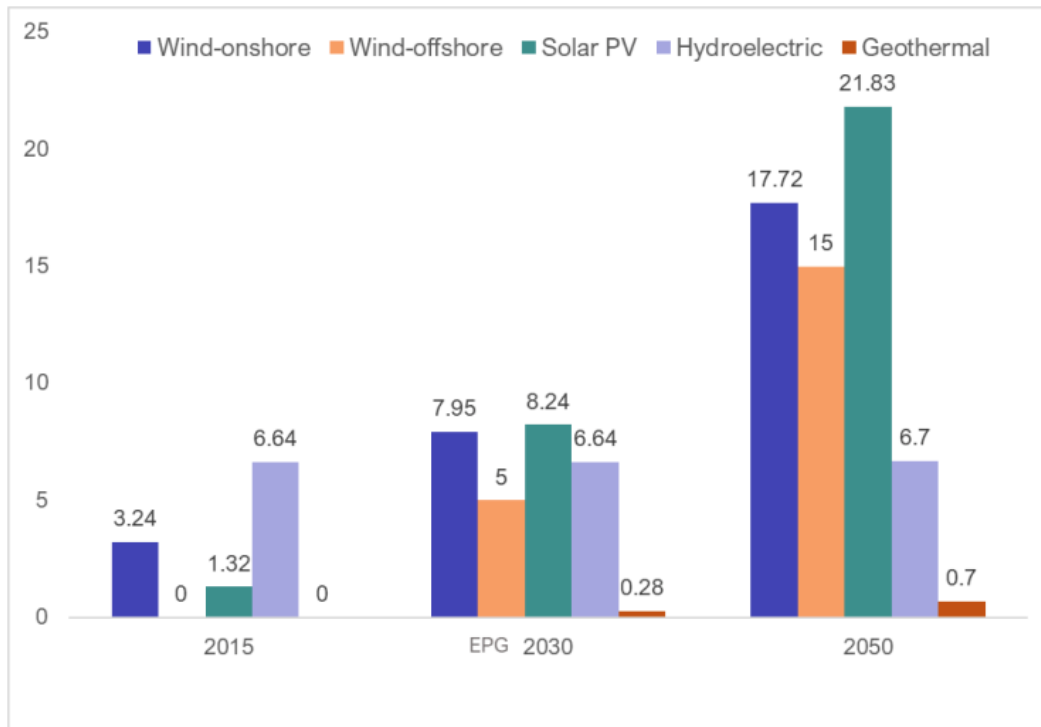
Figure 35. Installed capacity by source – REF, Middle and RO Neutral scenarios



*Note: Starting from 2036, natural gas-powered plants will be operated 100% on hydrogen. However, in the above Figure, they are still being represented being powered by natural gas

Romania's Energy System

Pathways to decarbonization – 2030 and beyond - Energy Policy Group version



Romania's Energy System

- Gap Analysis – Renewable generation capacity [GW]

[GW]	Solar			Wind (onshore + offshore)			Hydro		
	2025	2030	2050	2025	2030	2050	2025	2030	2050
Romania Energy Strategy / NECP	3	5	-	4	5	-	8	8	8
Romanian LTS (reference scenario)	4	8	14	5	7	10	7	7	7
Romanian LTS (RO Neutral)	5	8	31	5	7	14	7	7	7
EPG scenario	-	8	22	-	13	33	-	7	7

Romania's Energy System

Pathways to decarbonization – Policy Recommendations



Invest in grid infrastructure (both at TSO and DSOs level)



increasing the level of electrification (alternative transportation, efficient heating and cooling)



Increase the energy security level, through :

renewable generation, offshore wind generation

Continue the **nuclear energy** program, by focusing on both the Cernavoda nuclear power plant, as well as on small modular reactors (SMRs)

support the **prosumers** and their ecosystem, but also tackle **energy vulnerability** issues

A significant support to intermittent clean generation has to be given by **batteries** and A country-wide **demand response program** needs to urgently be developed.



an accelerated digitalization process of the energy systems is a vital step ahead.



Energy market design has to be reconsidered to address structural issues (centralized markets, balancing market)