Forum Energii
Analizy i dialog

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Electrification for energy security. How Poland can reduce its dependence on fuel imports

Poland's economy is one of the least electrified in the European Union and, under current government plans, it is set to remain so. The newly published Electrification Action Plan proposes an EU-wide electrification rate target of 46% by 2040. In the same period, Poland, however, assumes that its rate will reach just 26.3%. This would be the lowest level of electrification in the EU, entrenching the country's dependence on imported fuels and energy. An accelerated pathway for electrifying industry, transport, and heating could bring Poland closer to the EU target and, above all, strengthen its resilience to external price shocks while reducing energy consumption by 15%.

Why electrification?

Poland and the other European Union member states do not have sufficient domestic natural resources to meet their current energy needs. As a result, in 2024 (the latest data available), imports accounted for 82% of the natural gas and 98% of the crude oil consumed in Poland[1]. The figures for the European Union as a whole were also very high: import dependency stood at 85% for gas and 97% for oil and petroleum products[2]. Overall, almost half (46%) of the energy consumed in Poland, regardless of its form, is imported. This supply structure leaves Poland exposed not only to price shocks on international markets but also to deliberate or accidental disruption of the infrastructure on which those imports depend.

It is impossible to build a competitive economy when its functioning depends on fuels whose supply is uncertain and price higher than in the countries that produce them. For example, at the time of writing, the gas price at the US Henry Hub is roughly one-sixth of the price at the European TTF hub[3].

For years, diversification may have appeared to be the key to stable economic growth. Moving away from Russian gas was a difficult task, both in terms of infrastructure (in Poland, it would not have been possible without the LNG terminal commissioned in 2016 and Baltic Pipe, which became operational ahead of the 2022-2023 heating season) and mindset, particularly in Western Europe, which for years invested both in good relations with Russia and new import routes from it.

The fall in Russia's share of pipeline gas imports from 40% in 2021 to 6% in 2025 should nevertheless be regarded as a success for diversification, especially as imports of Russian gas into

[1] Source: https://www.forum-energii.eu/en/yearbook-energy-data-1
[2] Source: https://ec.europa.eu/eurostat/web/products-eurostat-news/w/wdn-20260318-1
[3] Comparison of the Henry Hub index price (https://stooq.pl/q/?s=ng.f) and TTF (https://stooq.pl/q/?s=tg.f), converted to a common unit of energy (MWh). Calculated on 15 July 2026 at approximately 14:00.

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the EU will be prohibited from 2027[4]. Even so, the current global energy crisis triggered by the war waged by the United States and Israel against Iran clearly demonstrates that diversification is not enough. While it can change where imported energy comes from, it does not reduce how much is imported. In globalised LNG and oil markets, a sudden rise in demand, for example, from China, or a rapid drop in supply because a major transport route is blocked has an immediate and direct impact on prices in the EU, the world's largest LNG importer. Moreover, given the design of the European energy market, increases in gas prices immediately translate into higher electricity prices. Few examples better illustrate the butterfly effect on today's energy economy.

The next logical step after diversification is therefore to reduce the volume of imported fuels and, consequently, their consumption.

Every civilisation, however, needs energy in order to develop. Electricity from renewable sources can be generated locally rather than imported. Expanding the supply side alone (increasing the availability of energy) is not enough to reduce import dependency substantially. Fuels must also be replaced by electricity in end-use sectors: factories, homes, transport, and elsewhere. This is precisely what the electrification rate measures—the share of electricity in final energy consumption.

The benefits of electrification do not end with reducing dependence on imported fuels. Delivering the same service using electricity, whether moving people and goods or carrying out other tasks, also requires less energy than using fuels. For example, a household heat pump uses about one-quarter as much energy as a gas boiler, an electric car about one-third as much as a combustion-engine car, and an industrial heat pump between one-half and one-third as much as a gas-fired steam generator. As a result, the country's total energy consumption falls. Economies that are more electrified also retain more spending domestically instead of transferring it to foreign fuel suppliers.

An ambitious electrification pathway is therefore not driven solely by the need to meet EU targets or by climate ambition. It is one of the principal conditions for restoring competitiveness, strengthening resilience to future crises and price shocks, and ensuring energy security.

Poland compared with the EU

Poland currently has the fourth-lowest electrification rate in the EU[5]. In 2024 (the latest data available), electricity accounted for just 17.4% of energy consumption, compared with an EU average of 23.4% (by comparison, Sweden is at 33.7%, the Netherlands at 23.9%, and Slovenia at 22.9%)[6].

Poland's low electrification rate is clearly visible in the three main sectors of the EU's energy transition: buildings, transport, and industry. In buildings, Poland has the fourth-lowest rate, at 25.6% (compared with an EU average of 35.5%). In transport, it is part of the long tail of countries with low

[4] Source: https://www.consilium.europa.eu/en/infographics/where-does-the-eu-s-gas-come-from/
[5] Only Lithuania (16.5%), Romania (15.8%), and Latvia (11.3%) rank below Poland.
[6] Source: Eurostat (nrg_bal_c).

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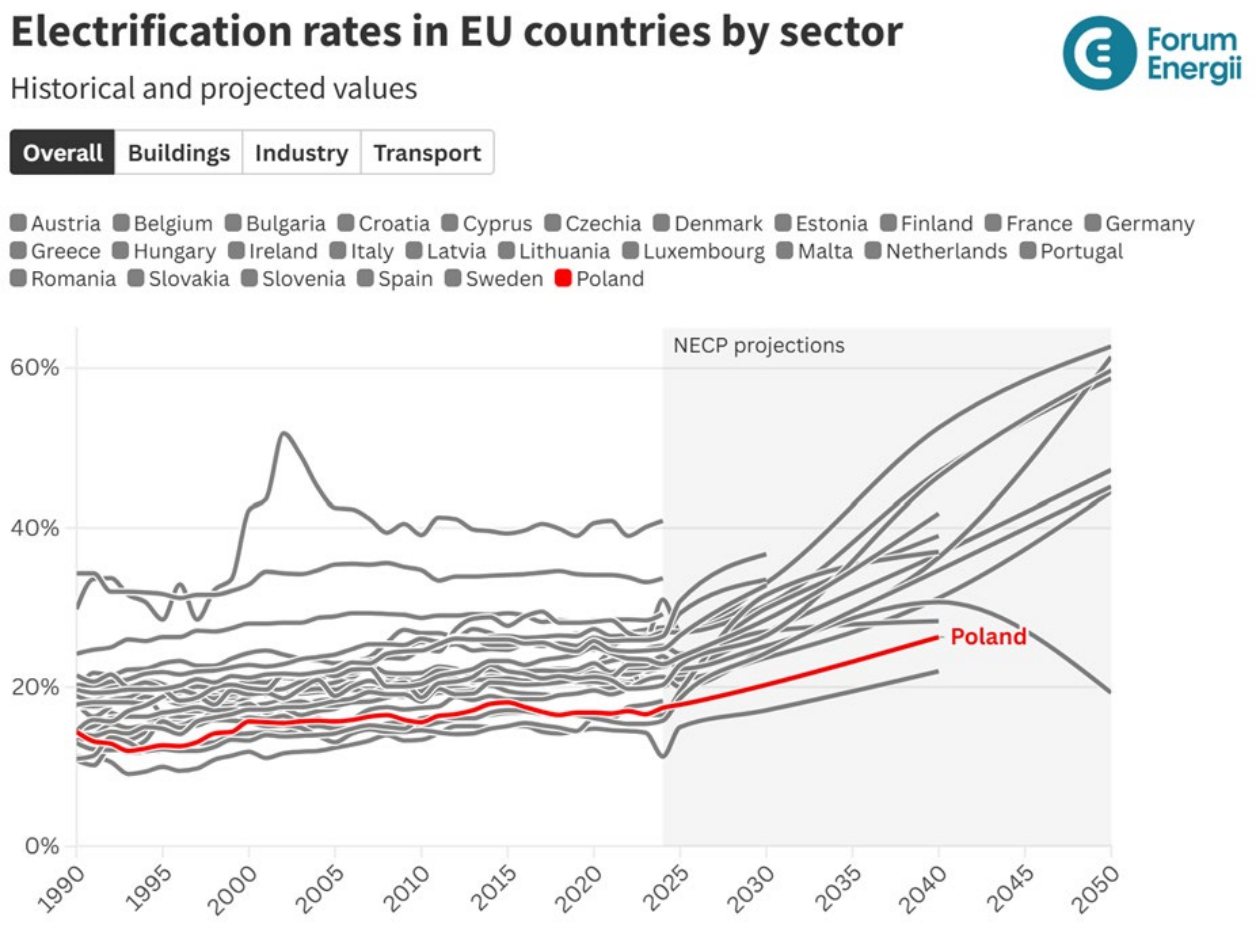
electrification, with a rate of 1.4% (against an EU average of 2.3%). The situation is somewhat better in industry, where Poland is just below the EU average (31.6%, compared with 33.3% for the EU).



Source: own elaboration by Forum Energii, based on the National Energy and Climate Plans adopted by individual countries (via EMBER Latest EU NECP Target Data dataset) and the latest version of the Polish National Energy and Climate Plan from June 2026.

An analysis of the National Energy and Climate Plans (NECPs)[7] of the individual member states reveals Poland's exceptionally low ambitions for electrification compared with other EU countries. Under the WAM scenario—the more ambitious of the two—the economy-wide electrification rate will reach 20.3% in 2030 and 26.3% in 2040. If it holds, this means that Poland will remain one of the EU's least electrified economies and that, even 14 years from now, it will not have reached the electrification rates already recorded today in such member states as Portugal (26.4%) or Bulgaria (27.5%).

[7] The NECP is a strategic document prepared by every EU member state to project the pace of its energy transition. It is updated every five years and must set out national targets and the associated policies. The projection section of each NECP must include two scenarios: WEM (With Existing Measures), a continuation-of-the-status-quo scenario; and WAM (With Additional Measures), a scenario reflecting the situation after the proposed policies have been implemented.

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P The outlook for the electrification of individual sectors by 2040[8] is no less disappointing. The projected electrification rate for buildings in 2040 (35.8%) will be lower than Croatia's rate today (36.8%); the rate for industry (39.2%) will be lower than Italy's today (39.4%); and the rate for transport (8.8%)—the area of economic activity electrifying the fastest—will only slightly exceed Sweden's current level (6.2%).

The accelerated pathway

This outcome is not inevitable for Poland: the country has the capacity to electrify rapidly. In 2030, it could move into the middle of the ranking with an electrification rate of 25.3%; by 2040, it could move towards the group of the most electrified countries, reaching 42.9%. This will, however, require faster electrification across individual sectors.

- Implementing the pathway for electrifying the buildings sector proposed by Forum Energii[9] would raise the sector's electrification rate in 2040 from the 35.8% included in the NECP to 43.6%—roughly the current level in France (43.2% in 2024) or Ireland (46.1% in 2024).
- In industry[10], fully realising the potential to electrify heat using technologies available today, as calculated by Forum Energii[11], would increase the sector's electrification rate from 39.2% in the NECP to 69%—roughly the current level in Norway (64.4% in 2023) or Malta (75.9% in 2024).
- In transport, Poland could follow Slovenia, which projects transport electrification rates of 13.1% in 2030 and 26.6% in 2040. Slovenia—like every other EU country—prepared its NECP before Poland. Most of the analytical work was carried out in 2024, when the outlook for electromobility was less favourable than it is today (among other things, forecasts did not anticipate such a rapid decline in the cost of car batteries). This more conservative electrification pathway can therefore now be regarded as realistic.

[8] Electrification rates are not stated directly for the individual sectors and had to be calculated separately.
[9] P. Kleinschmidt, *Przyszłość bez gazu i węgla. Strategia dla sektora ciepła* [*A future without gas and coal: A strategy for the heating sector*], Forum Energii, 2023, https://www.forum-energii.eu/cieplownictwo-bez-wegla-i-gazu
[10] In line with the EU methodology, the industrial sector excludes non-energy use (for example, natural gas used to manufacture fertilisers), as well as the refining and coke sectors.
[11] M. Dusiło, A. Rogożyńska, S. Buchholtz, *Modernisation or marginalisation. How can industrial electrification ensure security, competitiveness and economic growth for Poland?*, Forum Energii, 2026, https://www.forum-energii.eu/en/modernisation-or-marginalisation

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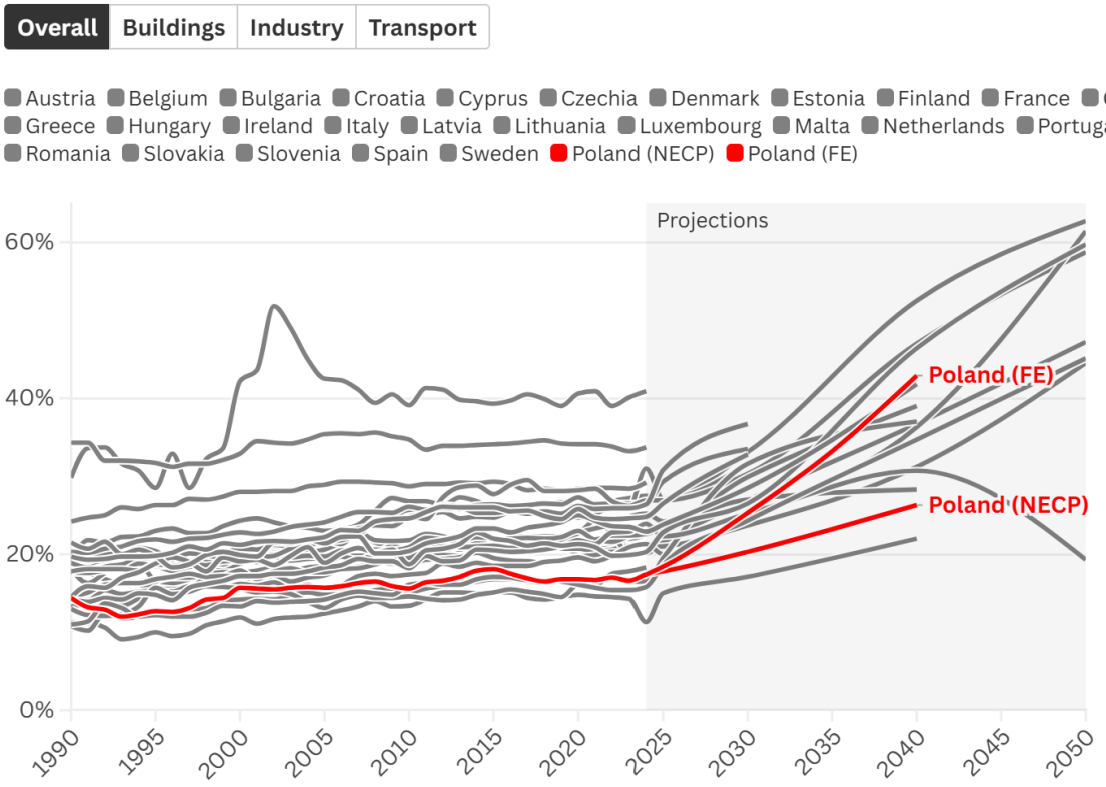
Electrification rates in EU countries by sector

Historical and projected values. For Poland, the projection from NECP and the accelerated forecast are shown



Source: own elaboration by Forum Energii, based on the National Energy and Climate Plans adopted by individual countries (via EMBER Latest EU NECP Target Data dataset) and the latest version of the Polish National Energy and Climate Plan from June 2026.
The accelerated path of the electrification in buildings sector is in line with the report by P. Kleinschmidt, Przyszłość bez gazu i węgla | Strategia dla sektora ciepła, Forum Energii, 2023.
The accelerated path of the electrification in industry sector involves the linear (between 2025 and 2040) realisation of the potential for the electrification of heating in sectors C10–C32, in accordance with the report by M. Dusiło, A. Rogożyńska and S. Buchholtz, Modernisation or marginalisation. How can industrial electrification ensure security, competitiveness and economic growth for Poland?, Forum Energii, 2026.
The accelerated path of the electrification in transport sector is derived from Slovenia's National Energy and Climate Plan.

The accelerated economy-wide electrification pathway outlined in this way would bring Poland closer to the target proposed by the EU. Above all, however, it would reduce final energy consumption in 2040 by 15% compared with the current scenario set out in the NECP. Although total energy consumption would be lower, electricity demand would naturally increase. Relative to the WAM scenario, it would be 67 TWh (+38%) higher in 2040. A higher volume of electricity sales could reduce unit distribution costs, provided, among other things, that adequate flexibility on both the demand and supply sides is ensured. It would also pose a major infrastructure challenge, however, as new power plants and grids would need to be built to meet electricity demand 63% higher than today.

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To ensure that electrification does not prolong the economy's dependence on imported energy, the additional electricity must come predominantly from zero-emission sources.

Recommendations

The EU Electrification Action Plan should not become merely another indicator to be reported. It should provide the impetus to recognise electrification as one of the pillars of energy security and economic resilience, and to develop a Polish strategy for electrifying the economy. Its objective should be to replace imported fuels with domestically generated electricity, while reducing energy consumption and the cost of operating the system as a whole. To achieve this, Poland should:

1. **Make electrification one of the pillars of national resilience and economic modernisation.** Given the long-term nature of the investments required, this direction should remain stable regardless of the electoral cycle and should rest on a broad, cross-party consensus. Poland needs an economy-wide electrification strategy setting an overarching target alongside coordinated strategies for buildings and district heating, industry, and transport for 2030 and 2040. These strategies should set out a timetable, instruments, funding sources, and responsible institutions, and their provisions should be incorporated into the NECP, Poland's Energy Policy to 2040 (PEP2040) and the relevant sectoral documents.
2. **Synchronise electrification with the expansion of domestic zero-emission generation and grids.** In the current decade, this requires above all removing barriers to onshore wind deployment, investing in grids and energy storage, developing solar PV and delivering offshore wind projects on time. Nuclear power can complement the zero-emission power mix, but its long investment cycle means that it cannot replace measures that are already needed today.
3. **Plan grid expansion in advance and make better use of existing infrastructure.** In their development plans, system operators should take account not only of new electricity generation but also of existing demand centres whose electricity needs will grow rapidly. Reliable information on available grid-connection capacity must be made accessible, connection procedures must be shortened and direct lines must become a genuinely viable option.
4. **Remove the economic penalty for choosing electricity over fuels.** The government should review the taxes, levies, and tariffs imposed on electricity so that efficient electric technologies are not systematically placed at a disadvantage relative to, for example, gas boilers. Tariffs should reward flexible electricity demand. Support mechanisms for industry should be conditional on investment in energy efficiency, electrification, and reducing dependence on imported fuels.
5. **Develop a strategy for electrifying buildings and district heating that links building modernisation with the electrification of heating.** Support instruments should cover the entire investment process: assessing the condition of a building, carrying out comprehensive or staged energy-efficiency renovation, selecting an appropriate heat pump or connecting the building to a clean district heating system, and subsequently auditing the work. Grants should be focused on households affected by energy poverty, while other households need access to affordable long-term financing for these changes. The system should be complemented by local one-stop advisory centres. District heating systems should deploy

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large heat pumps and electrode boilers combined with thermal energy storage and waste heat recovery. They should also act as a flexibility resource for the power system.

6. **Develop an industrial electrification strategy and launch a national programme to prepare and finance projects that will implement it.** The programme should help companies conduct process audits and prepare investment-ready projects covering energy efficiency, heat recovery, energy management systems, and electrification technologies. Companies should gain easier access to clean electricity through on-site generation, power purchase agreements (PPAs), direct lines, and more efficient grid connections. Support cannot be limited to capital costs, because operating costs remain the principal barrier. Growing demand for electrification technologies should be used to develop capabilities and clean technology manufacturing in Poland and the EU.
7. **Develop a transport electrification strategy based on stable rules and the expansion of the charging ecosystem.** Policy should not rely solely on subsidies for the purchase of new cars. A tax system that rewards energy-efficient vehicles is needed, together with faster electrification of public and corporate fleets. Affordable electric-vehicle charging should be available to residents of both single-family homes and multi-apartment buildings. Smart charging and the aggregation of flexibility from electric vehicles should become standard. The electrification of cars should be complemented by the development of rail, public transport and cycling infrastructure. Public funds should not be spent on technological dead ends such as hydrogen-powered cars or buses (in most applications).
8. **Link funding and monitoring to results.** The needs identified in the NECP should guide the use of national and EU funds, while public money should primarily prepare investments and mobilise private capital. Progress should be measured not only by electricity's share of energy consumption but also by changes in total energy consumption, the volume of fossil fuels displaced, the value of imports avoided, the development of domestic zero-emission generation, waiting times for grid connections and the scale of flexible consumption.
9. **Use the EU ETS as a stable investment signal and a source of funding for electrification.** Auction revenues accruing to the Polish budget should be ring-fenced and used in full to provide a stable, multiannual funding stream for investments that reduce fossil-fuel consumption—above all electrification, zero-emission generation, grid expansion, and energy storage. Protection against carbon leakage is necessary, but the free allocation of allowances should reflect the technological and economic feasibility of decarbonisation in individual industries.

Implementing the Electrification Action Plan should not be an end in itself for Poland. It is in the country's interest to redirect spending away from oil and gas imports and towards investment in electrification and the production of clean technologies in Poland. Electrification is therefore not only a means of implementing climate policy, but also one of the principal conditions for long-term energy security and the competitiveness of the Polish economy.

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