INTERNATIONAL MONETARY FUND

Modernizing Latvia's Electricity Sector Through Closer EU Integration

Gianluigi Ferrucci and Can Ugur

SIP/2025/136

IMF Selected Issues Papers are prepared by IMF staff as background documentation for periodic consultations with member countries. It is based on the information available at the time it was completed on July 31, 2025. This paper is also published separately as IMF Country Report No 25/273.

2025
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SELECTED ISSUES PAPER

 SIP/2025/136

IMF Selected Issues Paper
European Department

Modernizing Latvia's Electricity Sector Through Closer EU Integration, Republic of Latvia
Prepared by Gianluigi Ferrucci and Can Ugur

Authorized for distribution by Luis Brandao-Marques
October 2025

ABSTRACT: This paper discusses strategies to modernize Latvia's electricity sector, focusing on deeper integration with the EU electricity grid. Based on the Latvian Energy Strategy 2050, which prioritizes a greener, more secure, and efficient energy supply, the paper highlights the advantages of EU grid integration over self-sufficiency. Empirical analysis using firm-level data shows that higher electricity prices and volatility harm manufacturing employment, particularly in sectors like beverages and pharmaceuticals. Looking ahead, Latvia plans to expand its renewable energy capacity, especially inshore wind farms, leveraging its competitive advantages. Closer integration with the EU grid will be crucial to fully realizing the economic, environmental, and energy security benefits from this expansion.

RECOMMENDED CITATION: Ferrucci, Gianluigi and Can Ugur, 2025. "Modernizing Latvia's Electricity Sector Through Closer EU Integration." IMF Selected Issues Paper 2025/135. Washington, D.C., International Monetary Fund.

JEL Classification Numbers:	C23; C55; H23; L11; L94; Q41; Q42; Q48
Keywords:	Electricity Prices; Volatility; Spillovers; Panel Model; Renewable Energy; Electricity Market Reform; Europe
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SELECTED ISSUES PAPERS

Modernizing Latvia's Electricity Sector Through Closer EU Integration

Latvia

Prepared by Gianluigi Ferrucci and Can Ugur [1]

[1] The authors would like to thank Helge Berger, Luis Brandao-Marques, and the Latvian Authorities for their helpful comments.

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REPUBLIC OF LATVIA

SELECTED ISSUES

July 31, 2025

Approved By
European Department

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CONTENTS

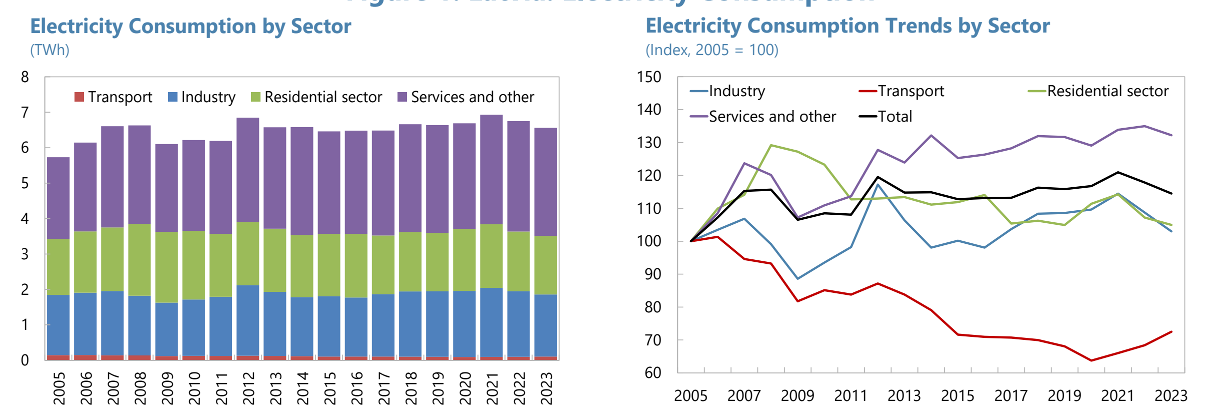
MODERNIZING LATVIA'S ELECTRICITY SECTOR THROUGH CLOSER EU INTEGRATION[1]

The desynchronization from Russia's electricity grid provides an opportunity to modernize Latvia's electricity infrastructure. Achieving a greener, more secure, and efficient electricity supply is a key policy goal of Latvia's Energy Strategy 2050. However, pursuing this objective through a push for higher self-sufficiency and autarky would be costly, inefficient, and ultimately socially undesirable. A more effective approach involves enhancing security and stability through greater integration with neighboring and EU electricity grids, alongside increased risk sharing. This would lead to cheaper, less volatile electricity prices for households and businesses. To fully realize the benefits of a unified electricity market, Latvia must strengthen collaboration at both the regional and EU levels, fostering a more resilient and interconnected electricity infrastructure.

A. Background: Electricity Demand, Supply, and Prices

1. Most of Latvia's electricity is used in industry and services. Latvia's electricity consumption has increased only modestly since 2005, driven by two main factors: income growth, which has positively impacted demand, and improvements in energy efficiency, which have been a drag for electricity consumption. The services sector has emerged as a key driver of this growth, reflecting its expanding role in the economy and the corresponding rise in its electricity needs (Figure 1). Conversely, the transport sector has seen a decline in electricity usage, albeit from an already low base. Despite these trends, Latvia's per capita electricity consumption remains low, at 3.7 MWh annually, compared with an EU average of 5.7 MWh. This suggests significant potential for growth in electricity consumption going forward, as the economy continues to catch up with more advanced European peers, and efforts to green the economy and enhance electrification progress.

Figure 1. Latvia: Electricity Consumption



Sources: IEA; and IMF staff calculations.

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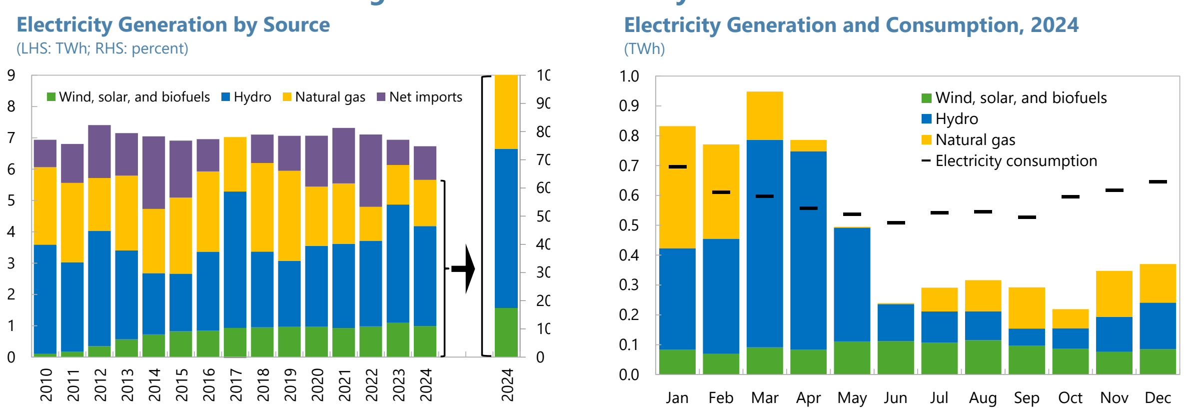
2. Latvia’s electricity consumption is mainly covered by local generation, with a high share of renewables in the energy mix. Hydroelectric power plays a leading role, accounting for about 56 percent of electricity generation in 2024 (Figure 2). This is supplemented by a growing contribution from other renewables—wind, solar, and biomass—whose share in electricity production has increased significantly since 2010. Natural gas accounted for about a quarter of electricity production in 2024 and serves as a balancing source. Despite the high share of local generation capacity, Latvia still experiences a production shortfall of approximately 1 TWh annually, covered through imports from neighboring countries.

3. Latvia’s electricity mix affects energy security and system balance. The country's green energy mix bolsters energy security by easing dependence on imported fossil fuels and supports the green transition by lowering greenhouse gas emissions. However, high reliance on renewables requires balancing mechanisms to manage the fluctuations in power supply from these sources. Notably, Latvia's hydro generation is primarily of the run-of-river type (i.e., the river flow produces electricity without large reservoirs for water storage), which results in high seasonal variability. Electricity generation peaks during the spring months but falls well below monthly consumption levels for the rest of the year (Figure 2). The volatility of hydro generation is also high over the years, depending on the variability of annual precipitations and snow melting. While other renewable sources provide relatively stable output over time, their contribution is insufficient to fill the gap with demand, leaving natural gas co-generation and electricity imports as key balancing sources to ensure stable power supply.

Figure 2. Latvia: Electricity Generation



Sources: IEA; and IMF staff calculations.

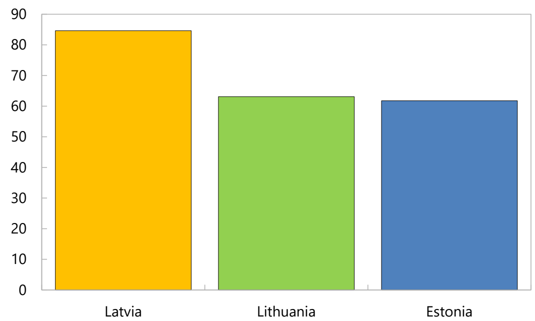
Sources: Eurostat; and Haver Analytics.

4. Integrating the Baltic ‘electricity island’ with the EU is key to reap the full benefits of a further expansion of renewable energy sources (RES) capacity. Latvia is a modest net importer of electricity, producing about 85 percent of its electricity needs domestically, relative to 60 percent in Lithuania and Estonia (Figure 3). Despite the high share of domestic production, the scale of bilateral net electricity flows highlights the critical role of electricity trade with neighboring countries as a stabilizing mechanism within the system. In the coming years, Latvia aims to further expand RES capacity, particularly through the development of inshore wind farms, where it holds a competitive advantage. Reaping the full benefits of further RES expansion requires significant grid upgrades and further integration of its electricity market into the EU.

Figure 3. Latvia: Electricity Consumption Covered by Local Generation and Net Imports

Electricity Consumption Covered by Local Generation, 2024

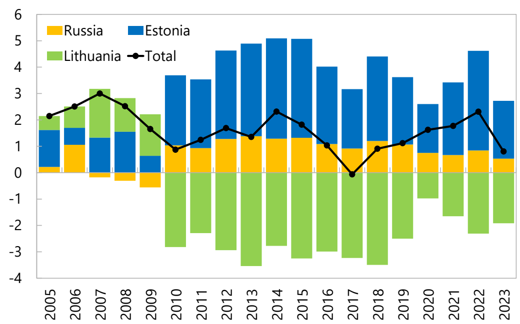
(Percent)



Sources: Augstsprieguma tīkls (AST); and IMF staff calculations.

Net Imports of Electricity in Latvia

(TWh)

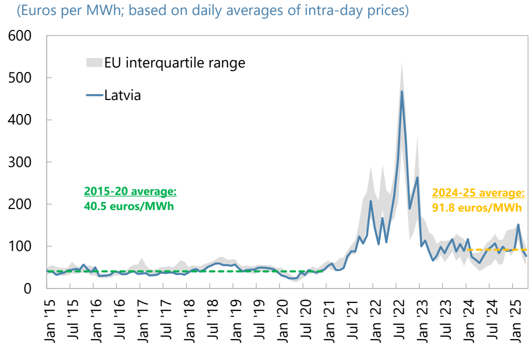


Sources: Eurostat; and IMF staff calculations.

Figure 4. Latvia: Electricity Prices and Volatility

Monthly Average Electricity Prices in Latvia

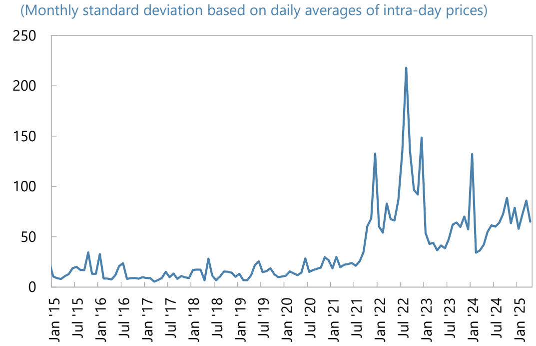
(Euros per MWh; based on daily averages of intra-day prices)



Sources: ENTSO-E; and IMF staff calculations.

Monthly Volatility of Electricity Prices in Latvia

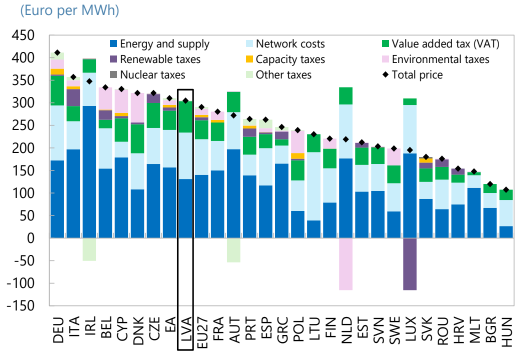
(Monthly standard deviation based on daily averages of intra-day prices)



Sources: ENTSO-E; and IMF staff calculations.

Electricity Prices for Household Consumers, 2024

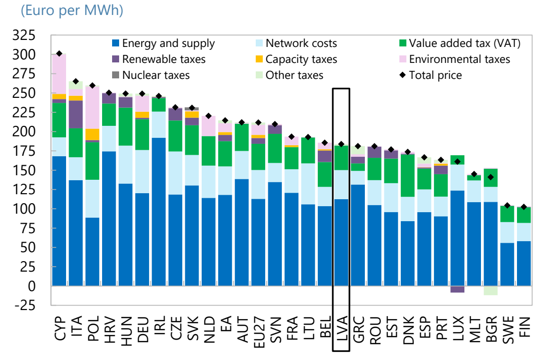
(Euro per MWh)



Source: Eurostat.

Electricity Prices for Nonhousehold Consumers, 2024

(Euro per MWh)



Source: Eurostat.

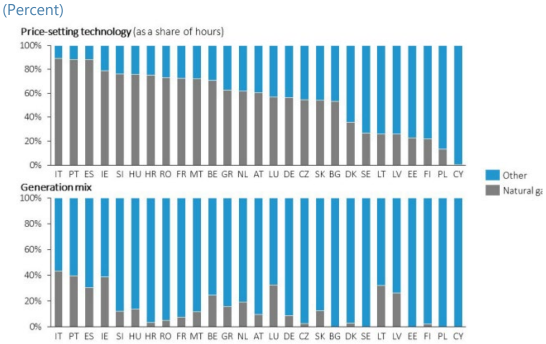
5. **Electricity prices and price volatility in Latvia remain above pre-pandemic levels.** In 2022, electricity prices surged to as much as ten times the pre-shock average (Figure 4). Although they have since receded, they remain well above pre-pandemic levels. Additionally, price volatility over time and dispersion across countries have risen sharply and have not yet returned to pre-crisis level. Currently, Latvia's electricity prices are close to the EU average. The final electricity bill for household

and non-household customers consists of three main components: the basic energy cost (approximately 50-60 percent of total); transmission costs (20-30 percent); and taxes (20 percent).

6. Marginal gas prices have a significant impact on electricity prices in Latvia and the EU. This is because EU electricity prices are largely based on the marginal spot pricing mechanism, with natural gas prices driving electricity prices for a larger share of time than their share in the power mix. For instance, natural gas was the price-setting technology 63 percent of the time in 2022 in the EU, despite accounting for only 20 percent of the electricity mix (Figure 5). The strong correlation implies that when gas prices are low, electricity prices tend to be equally low, but when gas prices rise sharply, as occurred during the 2022-23 shock, electricity prices follow suit. Gas price volatility has now largely subsided—but not for electricity prices, which have remained high and volatile, pointing to lingering effects from market fragmentation.

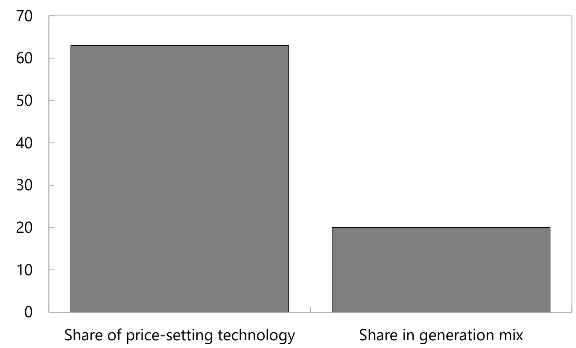
Figure 5. EU27: Electricity Price-Setting Technology

Price-Setting Technology per Member State and Their Generation Mix, 2022
(Percent)



Sources: European Commission, 2024; European Commission, JRC, 2023.

Natural Gas as Price-Setting Technology
(Percent; average of EU27 countries)

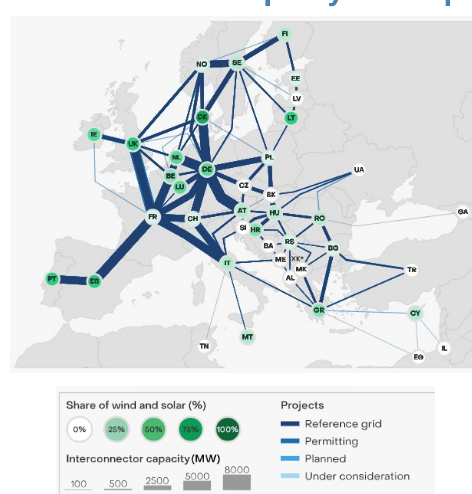


Sources: European Commission, 2024; European Commission, JRC, 2023.

B. Benefits of a More Integrated Electricity Market

7. Substantial interconnection capacity has been built across Western Europe, but significant gaps remain within the system. Despite the EU's efforts to develop several regional electricity trading markets and interconnectors during the recent crisis, the overall system remains fragmented amid still limited network integration. The effects of this fragmentation become particularly acute when the system experiences an unexpected shock. The inability to efficiently share risks across interconnected markets can exacerbate the impact of idiosyncratic shocks, highlighting the need for further integration and development of a more interconnected electricity network.

Interconnection Capacity in Europe

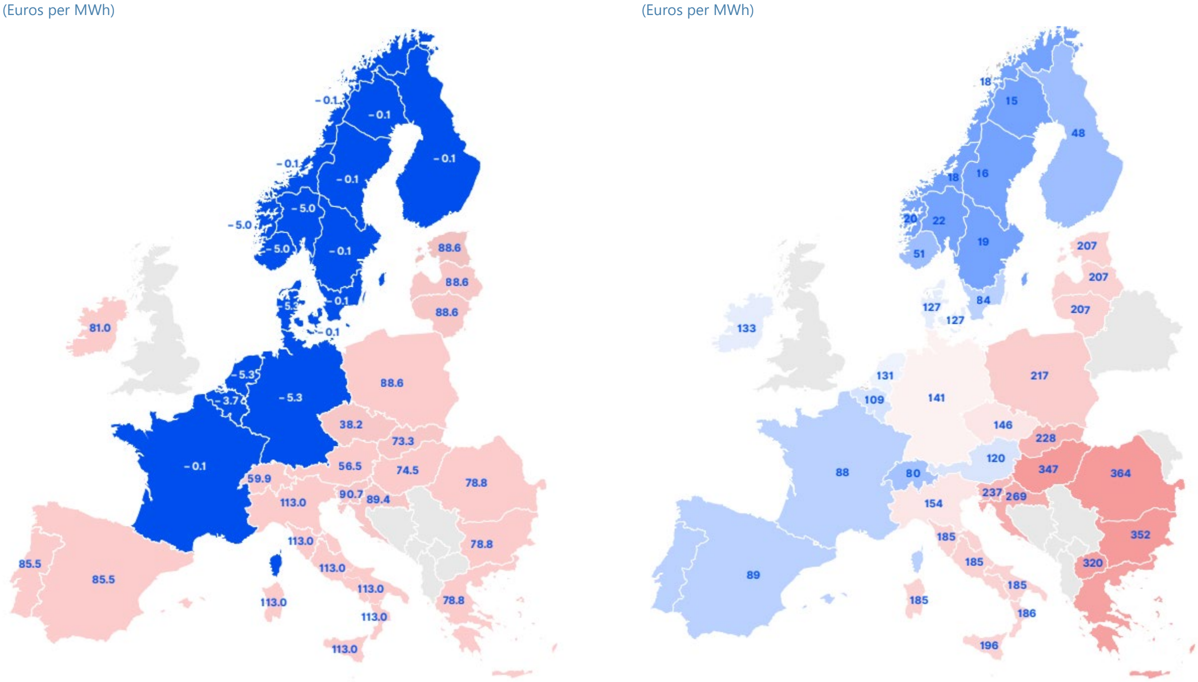


Source: Ember based on ENTSO-E data.

8. The lack of market integration can result in significant price differences across neighboring countries. For instance, in September 2023, starkly contrasting pricing was observed in adjacent bidding zones, with negative prices occurring in one area and positive prices in another due to bottlenecks that prevented exports (Figure 6). Similarly, in the summer of 2024, large price gaps emerged between Eastern and Western Europe, driven by a surge in demand from Ukraine. These examples illustrate how insufficient market connectivity leads to inefficiencies and divergence in electricity pricing and highlight the need for more integration within the EU electricity market.

Figure 6. Europe: Fragmentation in the Electricity Market

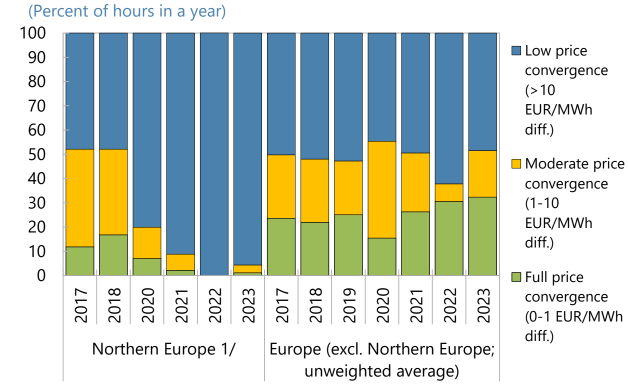
September 2023: Difference in Day-Ahead Electricity Prices (Euros per MWh) | **Summer 2024: Difference in Day-Ahead Electricity Prices** (Euros per MWh)



Source: ACER calculations based on ENTSO-E Transparency Platform data.

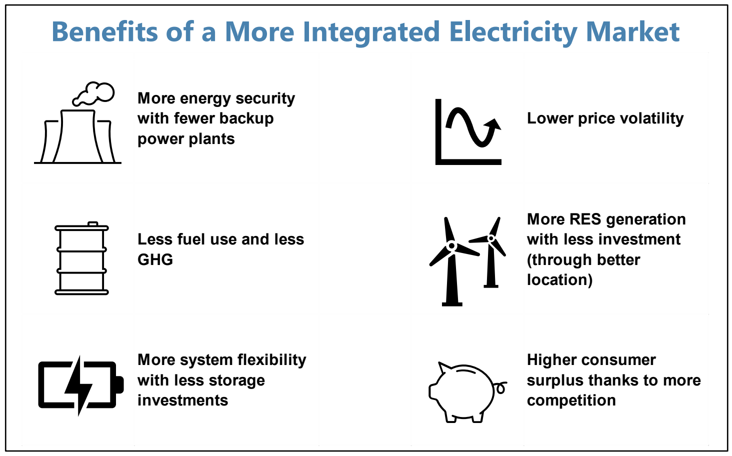
9. Market fragmentation can arise not only during crisis periods but also from local variations in electricity prices. Price differences exist due to cross-zonal congestion, both within certain regions and especially across regions. For instance, in the Northern Europe pricing zone, which includes Latvia, instances of low-price convergence—defined as a price difference of more than 10 EUR/MWh between two adjacent zones within a bidding region—have escalated from approximately 50 percent of the time in 2017 to about 95 percent of the time in 2023. This trend underscores the need for closer market integration, which would enhance price correlation across bidding zones by enabling

Price Convergence on Day-Ahead Markets
(Percent of hours in a year)



Sources: Adapted from Gorenstein Dedecca and others (2025); and IMF staff calculations.
1/ Northern Europe includes DNK, EST, FIN, LVA, LTU, NOR, and SWE.

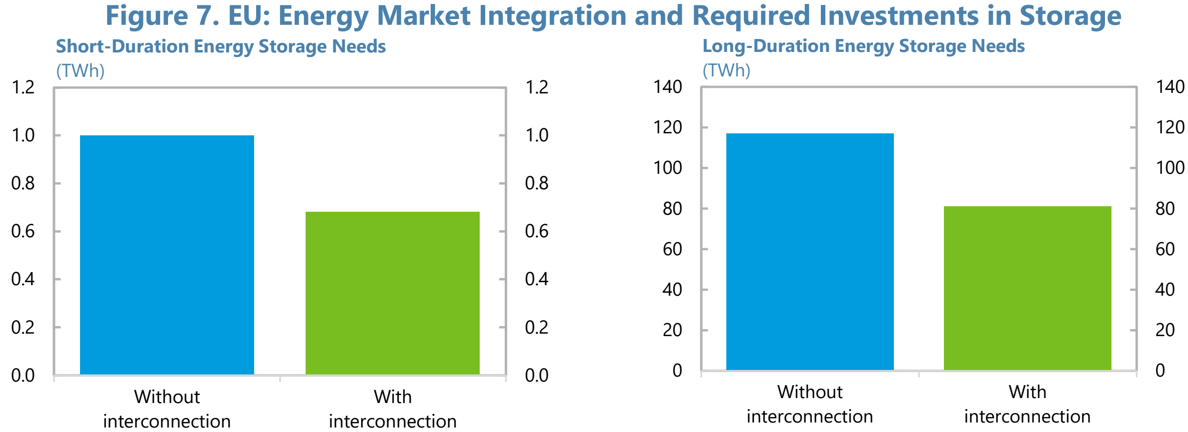
arbitrage opportunities between markets. Such integration could help alleviate the inefficiencies associated with fragmented pricing structures and promote a more cohesive energy market.



10. Lowering electricity prices, enhancing energy security, and decarbonizing the economy can be more effectively and efficiently achieved through closer integration of Latvia's electricity grid with the EU. An IMF (2025) study reviews the key benefits of greater integration of EU electricity markets. Drawing from the literature, it discusses how significant benefits can be secured from optimizing the design and operation of several national electricity systems jointly, rather than individually. Benefits stem mainly from risk sharing when demand and supply are not aligned across regions. They become larger the more countries move toward electrification and renewable-based power. Benefits include reduced need for expensive back-up capacity, less price volatility, less fossil-fuel burn, more RES generation with less investment through harnessing regional renewable advantages, more system flexibility with less storage investment, and higher consumer surplus.

11. The direct benefits of a more integrated electricity market in Latvia and the EU could be substantial. For instance, studies show that greater integration even within subsets of countries could reduce the needed dispatchable generation capacity to meet peak demand by nearly 20 percent and storage capacity by 30 percent (Figure 7), compared to a baseline scenario in which integration remains unchanged (Zachmann and others 2024; Roth and Schill, 2023). Additionally, Dolphin and others (2024) show that a significant increase in cross-border electricity trade could lead to a notable boost in annual EU GDP (by around 0.1 percent in 2030).

Figure 7. EU: Energy Market Integration and Required Investments in Storage



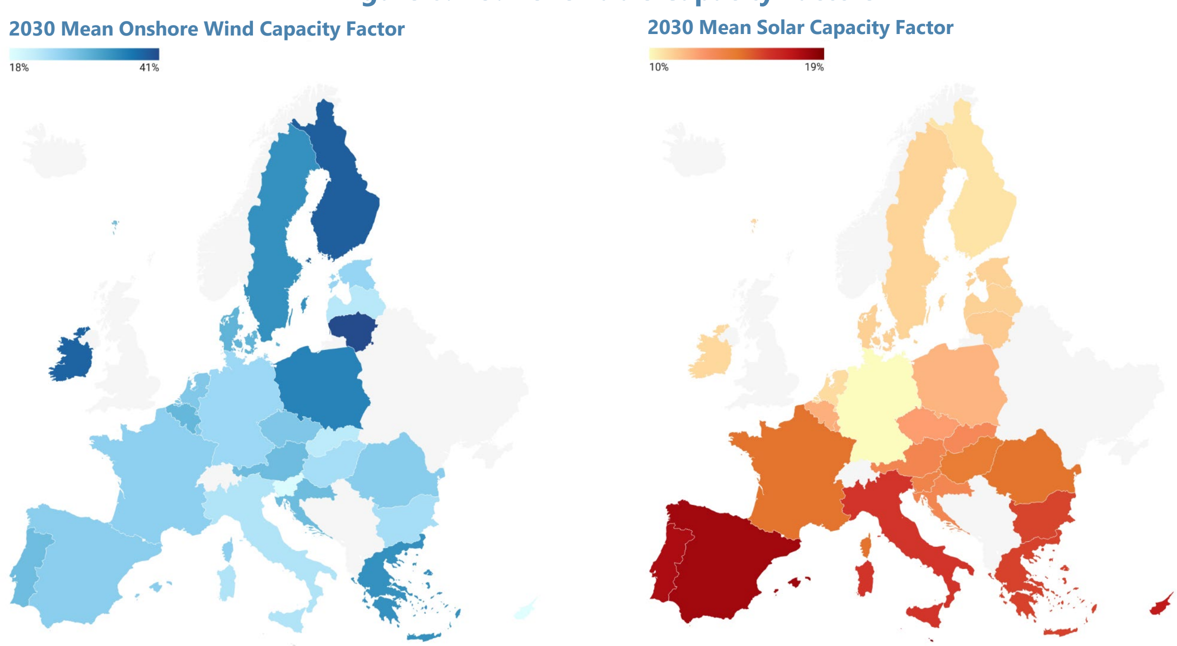
Source: Bruegel 2024 based on Roth and Schill 2023.

Source: Bruegel 2024 based on Roth and Schill 2023.

12. The transition to a predominantly renewable and low-carbon energy system, along with a more fully integrated EU energy market, would significantly lower electricity costs and price volatility, while electricity trade would support resilience to shocks. Lower energy costs and greater stability of the integrated system are also likely to foster investor confidence in the EU and make investments in innovative technologies more attractive. This should stimulate corporate investment not only in energy intensive industries, but also in key innovative sectors such as artificial intelligence, quantum computing, and digital service industries. All these technologies are underpinned by data centers with significant electricity demand that makes the availability of low-cost electricity a key consideration of investment decisions. In this way, a more integrated electricity grid with lower, less volatile electricity prices would contribute to firm dynamism, strengthening productivity growth.[2]

13. A more integrated energy market will deliver benefits in terms of the average level and volatility of energy prices, as renewable energy sources gain further weight in power generation (see Figure 8 for differences in renewable potential across the EU) and the electrification of end uses (e.g., electric vehicles and heating) continues to make progress.

Figure 8. EU: Renewable Capacity Factors



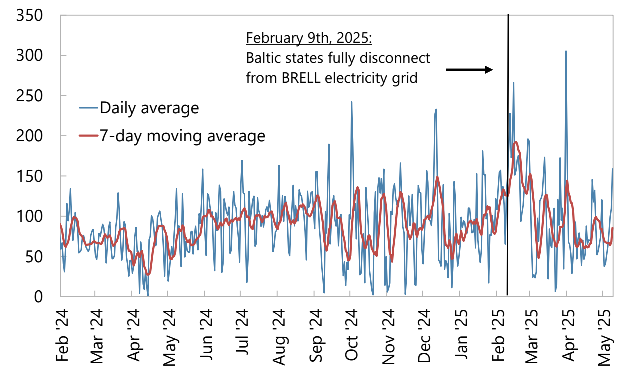
Source: Zachmann et al. (Bruegel, 2024).
Note: "Capacity factor refers to electricity produced at realistic wind or solar conditions, relative to the amount produced if the plants would in each hour have operated at their peak capacity. The figures are based on the assumptions for installed renewable capacities in 2030 reports to ENTSO-E.

Source: Zachmann et al. (Bruegel, 2024).
Note: "Capacity factor refers to electricity produced at realistic wind or solar conditions, relative to the amount produced if the plants would in each hour have operated at their peak capacity. The figures are based on the assumptions for installed renewable capacities in 2030 reports to ENTSO-E.

[2] See the SIP on "Allocative Efficiency, Firm Dynamics, and Productivity in Latvia" in this bundle.

14. The recent synchronization with the Continental Europe Synchronous Area (CESA) electricity grid is an opportunity to modernize Latvia's electricity infrastructure. On February 8, 2025, the three Baltic countries disconnected their power grids from the Russia, Belarus, Estonia, Latvia, and Lithuania grid (BRELL). The transition has resulted in higher electricity prices in the short term. Closer integration with the region and the EU would support higher risk sharing, leading to higher energy security, lower volatility, and lower prices in the long run.

Electricity Prices and BRELL Desynchronization in Latvia
(Euros per MWh)



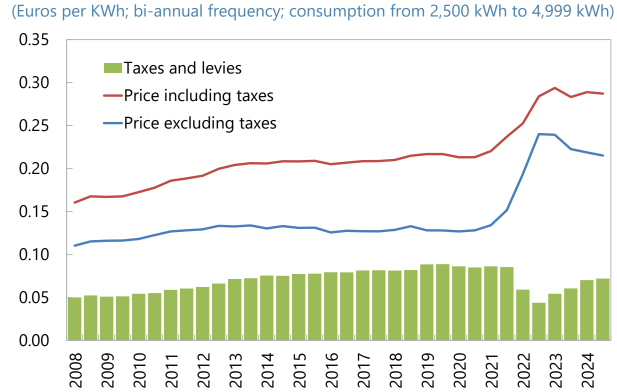
Sources: ENTSO-E; and IMF staff calculations.

C. Macroeconomic Costs of High Electricity Prices

15. High and volatile electricity prices have macroeconomic costs:

- **Competitiveness:** high electricity price disparity puts energy-intensive industries at a disadvantage in export markets.
- **Investment:** high electricity price volatility hurts investment.
- **Consumption:** high energy costs and high price volatility reduce household consumption.
- **Taxes:** high electricity prices are associated with lower excise tax revenue.

Electricity Prices for Household Consumers in EU27
(Euros per KWh; bi-annual frequency; consumption from 2,500 kWh to 4,999 kWh)



Source: Eurostat.

16. High electricity prices may affect manufacturing employment in Latvia. This hypothesis can be tested with a simple econometric exercise, which relies on estimating an equation relating firm-level employment to firm size, as captured by fixed assets, a set of firm-level controls, and the electricity price level (or volatility):

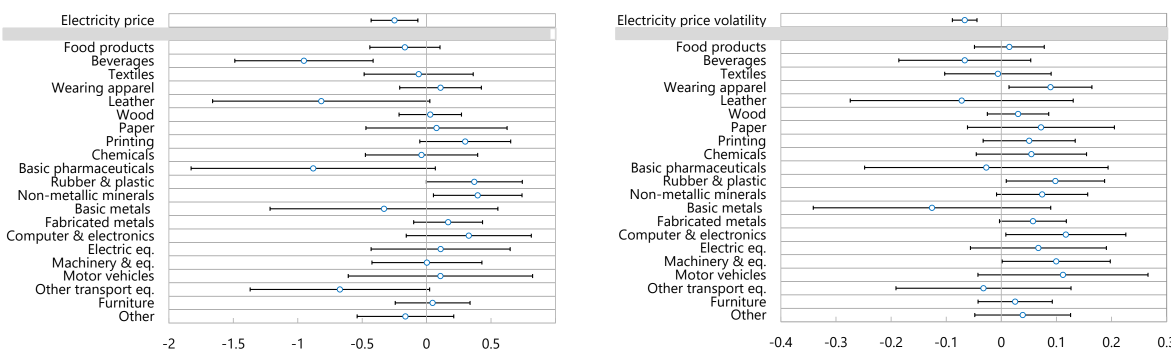
$$emp_{it} = \alpha_i + \mu_1 Y_{it} + \mu_2 fixed\_assets_{it} + \xi X_{it} + \varepsilon_{it},$$

where Y_{it} is the electricity price level ($price_{it}$) or its volatility (p_vol_{it}) depending on the model specification, $fixed\_assets_{it}$ denotes the firm's tangible assets, used as a proxy for firm size, and X_{it} a set of firm-specific controls. The regression specification is standard and includes sector (2-digit NACE codes), year, and year*sector fixed effects. The analysis focuses on Latvian manufacturing firms, excluding small firms (with less than two employees) and uses Orbis data for 2010-2022. The sample includes 49,561 observations. Electricity prices (from Eurostat) exclude taxes and pertain to the category “Consumption from 500 MWh to 1999 MWh – band IC”. Electricity price volatility is determined using intraday prices (from ENTSO-E) recorded every 15 minutes (96 data points per day) to compute daily averages. From these daily averages, the annual standard deviation is determined over approximately 365 data points.

17. The results show that higher electricity price levels and volatility reduce firm-level employment. For electricity price levels, we find an aggregate elasticity of -0.25: a 10 percent increase in electricity prices reduces employment in manufacturing by 2.5 percent (Figure 9). The impact is higher in specific industries: beverages, leather, pharmaceutical, transport equipment. For price volatility, we find an aggregate elasticity of -0.066: a 10 percent increase in electricity price volatility reduces employment in manufacturing by 0.66 percent. Also in this case, the impact is heterogeneous across industries. An important caveat is that job losses in manufacturing may be offset by job creation in less electricity-intensive sectors, such as services. However, the effects can become long-lasting in the presence of labor market frictions.

Figure 9. Latvia: Firm-Level Data Estimation for Electricity Price Level and Volatility

Electricity Price Effect on Employment (Circles = regression coefficients; lines = 95% confidence intervals) | **Electricity Price Volatility Effect on Employment** (Circles = regression coefficients; lines = 95% confidence intervals)



Sources: Orbis; Eurostat; and IMF staff calculations. | Sources: Orbis; ENTSO-E; and IMF staff calculations.

D. Conclusions

18. Latvia should improve interconnections to other European power grids. To unlock the full benefits of a unified energy market, Latvia must implement a coordinated strategy to strengthen collaboration at the EU and regional levels and make progress at the national level. A closer integration of Europe’s electricity markets could significantly increase economic activity: estimates range from 0.5 to 3.5 percent level increase in GDP, with the average EU country experiencing a 1.5 percent increase in GDP (Arnold and others 2025). Key actions include:

- **closer integration into Europe’s power grid:** coordinate policies and investments at the EU and national levels to fully integrate Latvia into Europe’s power grid;
- **resource pooling:** the authorities should consider pooling resources with neighboring countries to develop grid infrastructures that provide shared benefits across borders; and
- **streamline domestic permitting processes** to reduce the time and costs associated with building interconnections and more renewables.

Annex I. Regression Tables

Table 1. Latvia: Electricity Price Level Effect on Employment (Aggregate)

VARIABLES	(1) Model 1	(2) Model 2	(3) Model 3	(4) Model 4
Electricity price level	-0.249***	-0.249***	-0.0808	-0.724***
	(0.0925)	(0.0925)	(0.104)	(0.0959)
Fixed tangible assets	0.313***	0.313***	0.313***	0.313***
	(0.00157)	(0.00157)	(0.00157)	(0.00157)
Constant	-1.439***	-1.439***	-1.065***	-2.493***
	(0.178)	(0.178)	(0.235)	(0.186)
Observations	49,551	49,551	49,551	49,551
R-squared	0.477	0.477	0.477	0.477
Year FE	YES	YES	NO	NO
Sector FE	YES	NO	YES	NO
Year-Sector FE	YES	YES	YES	YES

Standard errors in parentheses
*** p<0.01, ** p<0.05, * p<0.1

Table 2. Latvia: Electricity Price Volatility Effect on Employment (Aggregate)

VARIABLES	(1) Model 1	(2) Model 2	(3) Model 3	(4) Model 4
Electricity price volatility	-0.0665***	-0.0665***	-0.0810***	-0.185***
	(0.0223)	(0.0223)	(0.0235)	(0.0231)
Fixed tangible assets	0.314***	0.314***	0.314***	0.314***
	(0.00186)	(0.00186)	(0.00186)	(0.00186)
Constant	-0.732***	-0.732***	-0.699***	-0.465***
	(0.0853)	(0.0853)	(0.0688)	(0.0869)
Observations	35,073	35,073	35,073	35,073
R-squared	0.475	0.475	0.475	0.475
Year FE	YES	YES	NO	NO
Sector FE	YES	NO	YES	NO
Year-Sector FE	YES	YES	YES	YES

Standard errors in parentheses
*** p<0.01, ** p<0.05, * p<0.1

Table 3. Latvia: Electricity Price Level Effect on Employment (Sectoral)

VARIABLES	(1) Model 1	(2) Model 2	(3) Model 3	(4) Model 4
Electricity price level				
Food products	-0.168	-0.192***	-0.249***	-0.249***
	(0.139)	(0.0386)	(0.0925)	(0.0925)
Beverages	-0.952***	0.209***	-1.033***	0.153
	(0.274)	(0.0635)	(0.253)	(0.126)
Textiles	-0.0614	-0.148**	-0.142	-0.205*
	(0.216)	(0.0598)	(0.190)	(0.124)
Wearing apparel	0.108	-0.526***	0.0273	-0.582***
	(0.162)	(0.0472)	(0.124)	(0.119)
Leather	-0.818*	-0.0497	-0.899**	-0.106
	(0.430)	(0.126)	(0.418)	(0.166)
Wood	0.0283	-0.0863**	-0.0525	-0.143
	(0.124)	(0.0341)	(0.0671)	(0.114)
Paper	0.0767	-0.110	-0.00407	-0.167
	(0.279)	(0.0818)	(0.259)	(0.136)
Printing	0.300*	0.00598	0.219	-0.0506
	(0.180)	(0.0531)	(0.147)	(0.121)
Chemicals	-0.0395	-0.0362	-0.120	-0.0928
	(0.222)	(0.0614)	(0.196)	(0.125)
Basic pharmaceuticals	-0.880*	-0.0235	-0.961**	-0.0801
	(0.484)	(0.132)	(0.473)	(0.171)
Rubber & plastic	0.370*	-0.132**	0.290*	-0.189
	(0.190)	(0.0547)	(0.159)	(0.122)
Non-metallic minerals	0.397**	-0.0556	0.316**	-0.112
	(0.175)	(0.0505)	(0.141)	(0.120)
Basic metals	-0.331	-0.0802	-0.411	-0.137
	(0.451)	(0.126)	(0.439)	(0.166)
Fabricated metals	0.167	-0.0854**	0.0862	-0.142
	(0.136)	(0.0367)	(0.0884)	(0.115)
Computer & electronics	0.327	-0.166**	0.247	-0.222*
	(0.248)	(0.0671)	(0.225)	(0.128)
Electric eq.	0.109	-0.255***	0.0284	-0.311**
	(0.275)	(0.0741)	(0.255)	(0.132)
Machinery & eq.	0.00253	-0.122**	-0.0783	-0.178
	(0.218)	(0.0590)	(0.191)	(0.124)
Motor vehicles	0.108	-0.112	0.0268	-0.169
	(0.365)	(0.0968)	(0.350)	(0.146)
Other transport eq.	-0.673*	-0.0674	-0.754**	-0.124
	(0.355)	(0.0882)	(0.340)	(0.140)
Furniture	0.0469	-0.0413	-0.0339	-0.0979
	(0.148)	(0.0407)	(0.106)	(0.116)
Other	-0.164	0.00292	-0.245	-0.0537
	(0.191)	(0.0505)	(0.161)	(0.120)
Fixed tangible assets	0.313***	0.313***	0.313***	0.313***
	(0.00157)	(0.00157)	(0.00157)	(0.00157)
Constant	-1.260***	-1.313***	-1.439***	-1.439***
	(0.291)	(0.0967)	(0.178)	(0.178)
Observations	49,551	49,551	49,551	49,551
R-squared	0.477	0.477	0.477	0.477
Year FE	YES	YES	NO	NO
Sector FE	YES	NO	YES	NO
Year-Sector FE	YES	YES	YES	YES

Standard errors in parentheses
*** p<0.01, ** p<0.05, * p<0.1

Table 4. Latvia: Electricity Price Volatility Effect on Employment (Sectoral)

VARIABLES	(1) Model 1	(2) Model 2	(3) Model 3	(4) Model 4
Electricity price volatility				
Food products	0.0146	0.0627***	-0.0665***	-0.0665***
	(0.0324)	(0.0125)	(0.0223)	(0.0223)
Beverages	-0.0663	-0.0686***	-0.147***	-0.198***
	(0.0610)	(0.0206)	(0.0564)	(0.0252)
Textiles	-0.00626	0.0483**	-0.0873**	-0.0808***
	(0.0493)	(0.0194)	(0.0433)	(0.0242)
Wearing apparel	0.0891**	0.172***	0.00809	0.0426**
	(0.0384)	(0.0153)	(0.0304)	(0.0211)
Leather	-0.0719	0.0164	-0.153	-0.113***
	(0.103)	(0.0408)	(0.101)	(0.0433)
Wood	0.0303	0.0280**	-0.0507***	-0.101***
	(0.0284)	(0.0111)	(0.0161)	(0.0183)
Paper	0.0719	0.0357	-0.00910	-0.0934***
	(0.0680)	(0.0265)	(0.0638)	(0.0302)
Printing	0.0505	-0.00201	-0.0305	-0.131***
	(0.0426)	(0.0172)	(0.0356)	(0.0225)
Chemicals	0.0545	0.0116	-0.0265	-0.118***
	(0.0510)	(0.0199)	(0.0453)	(0.0247)
Basic pharmaceuticals	-0.0272	0.00736	-0.108	-0.122***
	(0.113)	(0.0429)	(0.110)	(0.0453)
Rubber & plastic	0.0981**	0.0429**	0.0171	-0.0863***
	(0.0455)	(0.0177)	(0.0389)	(0.0229)
Non-metallic minerals	0.0740*	0.0181	-0.00706	-0.111***
	(0.0422)	(0.0164)	(0.0351)	(0.0219)
Basic metals	-0.126	0.0259	-0.207*	-0.103**
	(0.110)	(0.0408)	(0.107)	(0.0433)
Fabricated metals	0.0574*	0.0278**	-0.0237	-0.101***
	(0.0309)	(0.0119)	(0.0202)	(0.0188)
Computer & electronics	0.117**	0.0541**	0.0359	-0.0751***
	(0.0555)	(0.0218)	(0.0503)	(0.0262)
Electric eq.	0.0672	0.0832***	-0.0138	-0.0460
	(0.0629)	(0.0240)	(0.0584)	(0.0281)
Machinery & eq.	0.0995**	0.0395**	0.0185	-0.0896***
	(0.0500)	(0.0191)	(0.0442)	(0.0240)
Motor vehicles	0.112	0.0365	0.0308	-0.0926***
	(0.0787)	(0.0314)	(0.0752)	(0.0346)
Other transport eq.	-0.0324	0.0218	-0.113	-0.107***
	(0.0810)	(0.0286)	(0.0775)	(0.0321)
Furniture	0.0251	0.0135	-0.0560**	-0.116***
	(0.0344)	(0.0132)	(0.0251)	(0.0196)
Other	0.0387	-0.000971	-0.0423	-0.130***
	(0.0443)	(0.0164)	(0.0376)	(0.0219)
Fixed tangible assets	0.314***	0.314***	0.314***	0.314***
	(0.00186)	(0.00186)	(0.00186)	(0.00186)
Constant	-0.916***	-1.025***	-0.732***	-0.732***
	(0.101)	(0.0522)	(0.0853)	(0.0853)
Observations	35,073	35,073	35,073	35,073
R-squared	0.475	0.475	0.475	0.475
Year FE	YES	YES	NO	NO
Sector FE	YES	NO	YES	NO
Year-Sector FE	YES	YES	YES	YES

Standard errors in parentheses
*** p<0.01, ** p<0.05, * p<0.1

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