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The territory of Latvia has significant wind energy potential and problems

- In Latvia, both on the seacoast and inland, there is a great potential for wind energy from the climate aspect.
- Latvia's historical reliance on hydroelectric power has established a strong foundation for renewable energy.
- Challenges related to land constraints and permitting processes hinder the widespread adoption of wind energy.

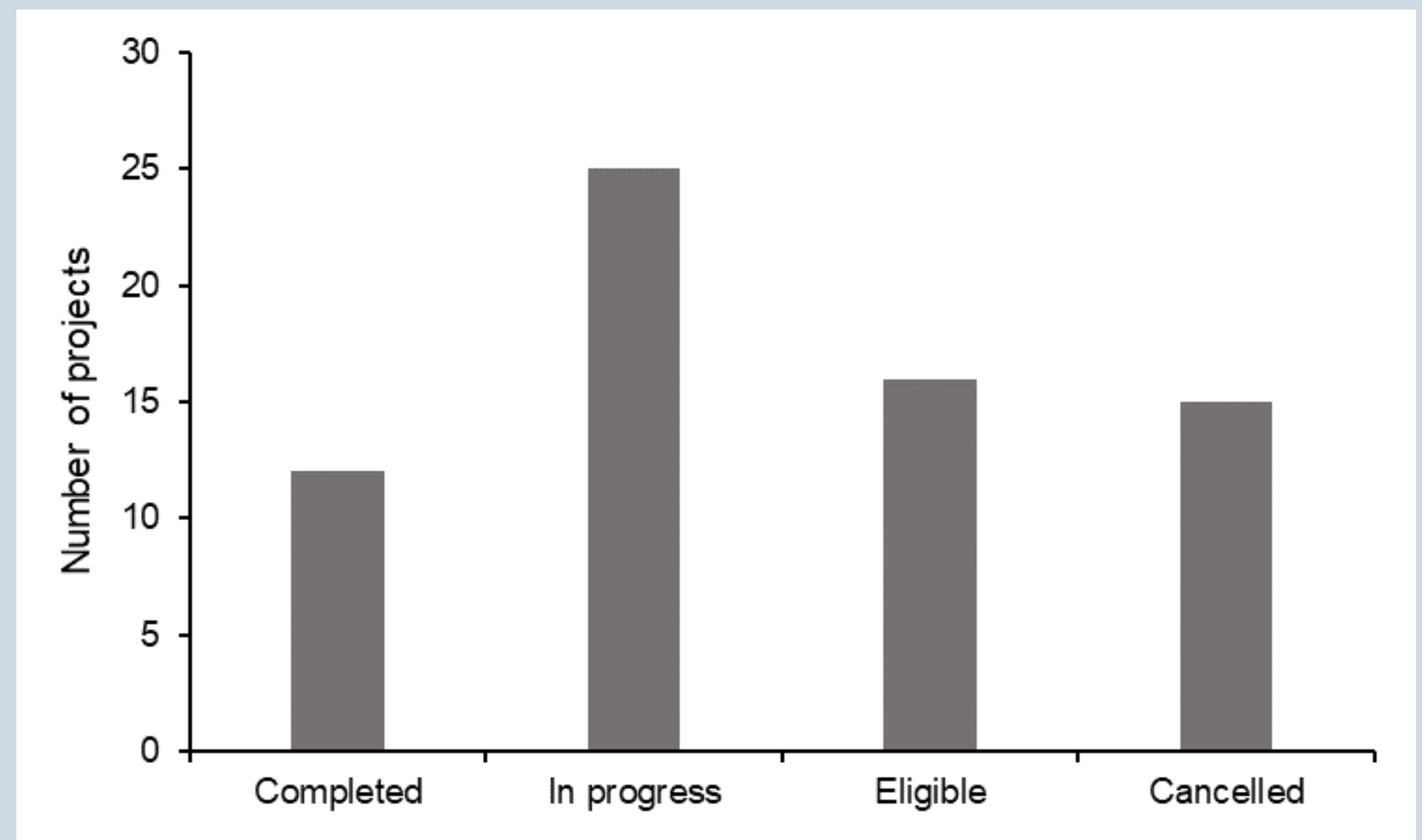
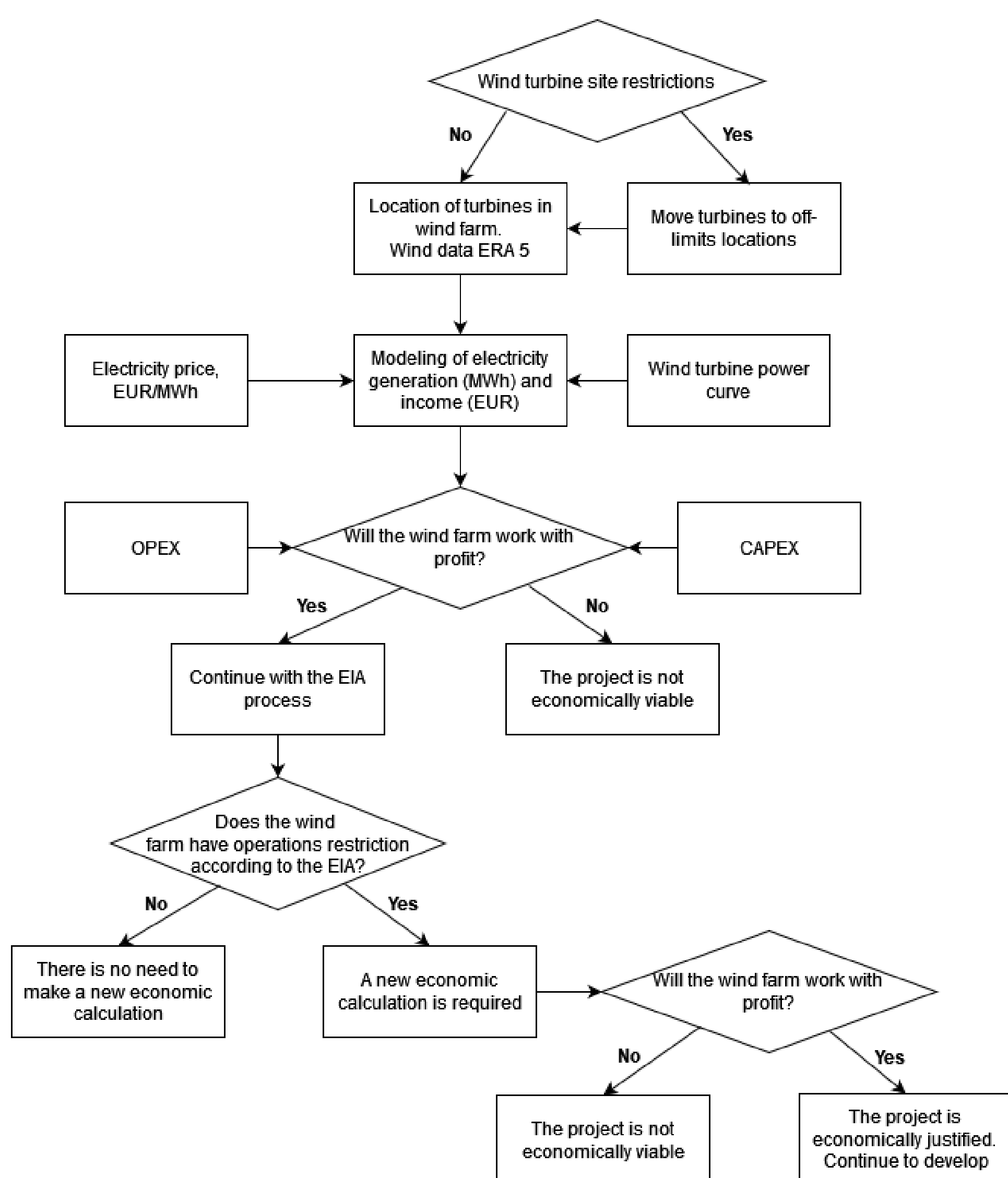


Fig.1 Project statuses of environmental impact assessments for the construction of wind farms

Introduction

To assess the real possible potential of a wind farm, it is important to look at the concrete ones Wind farm projects to obtain the most accurate cost estimate possible, as well as to evaluate the possible obstacles of the project from a technical, administrative, and environmental point of view. Thus, the analysis of this case focuses on the coastal region of the Baltic Sea - Ventspils, where there is the greatest potential for wind energy development.

Analysis algorithm



Results

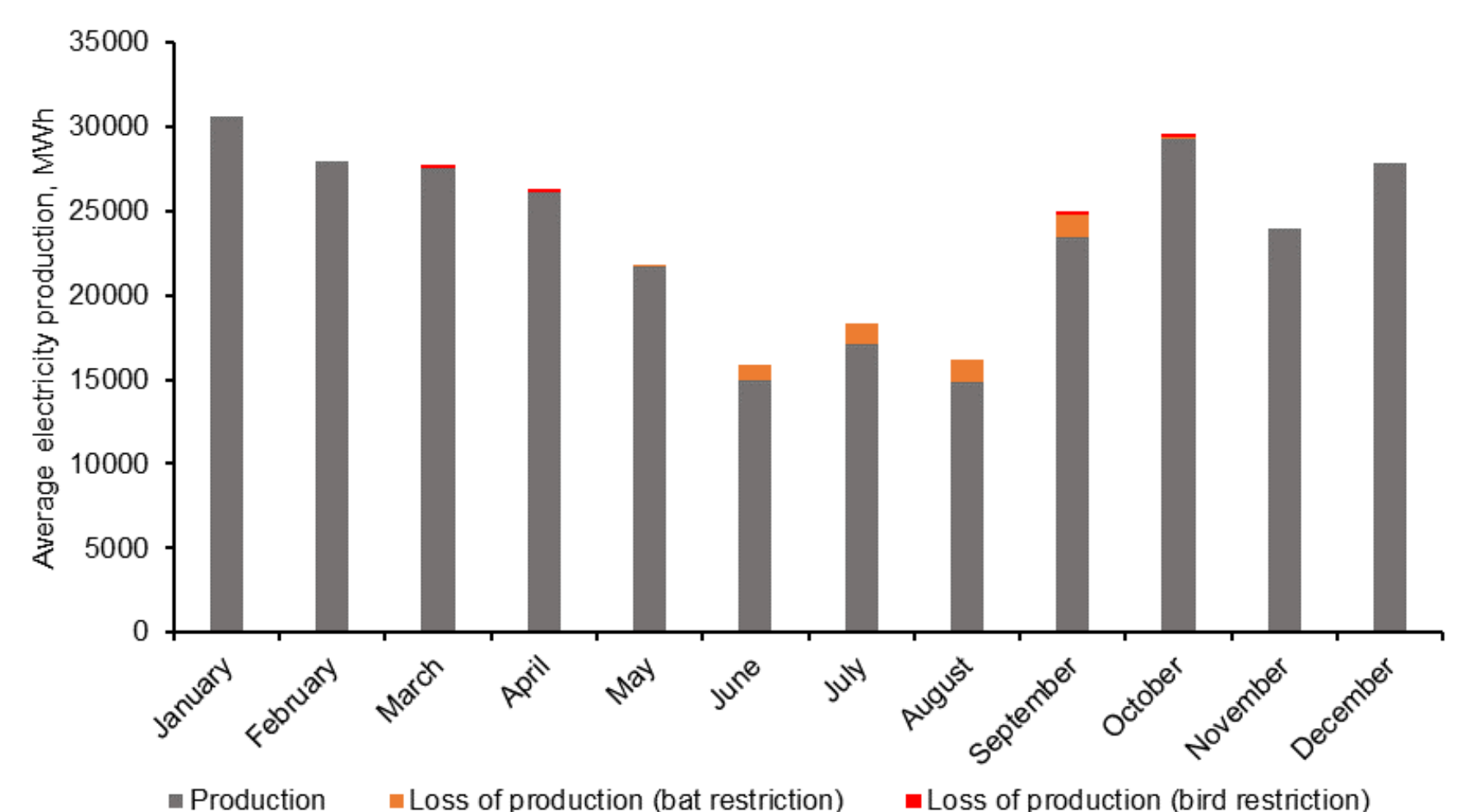


Fig. 2. Bird and bat restriction impact on energy production in wind farm

TABLE 1. COST BENEFIT ANALYSE

	No restriction	Only bat restriction	Only bird restriction	Bat and bird restriction
CAPEX, EUR		- 158 400 000		
OPEX, EUR		- 103 950 000		
Income from electricity, EUR (over 25 years, if the price of electricity is 89.97 EUR/MWh)	+ 654 853 603	+643 500 915	+653 022 366	+641 693 784
Revenue, EUR	+392 503 603	+381 150 915	+390 672 366	+379 343 784
LCOE, EUR/MWh	36.04	36.68	36.15	36.78
Payback period, years	10.02	10.19	10.04	10.22

Conclusions

The successful development of wind farms in Latvia requires the optimization of legislation and regulatory framework, the integration of the Renewable Energy Directive (RED III) into political planning documents and the regulatory framework of wind farms, considering it equally important with biological diversity. According to the analysis data and modelling of a real wind farm operation scenario, the wind farm investment payback period is short 10-11 years, which could be attractive to investors if there is an unchanged legal framework and a stable electricity price.