

A Practical Decision-Support Framework for Screening Industrial Flexibility Across Electricity Market Mechanisms

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Extended Abstract

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Abstract Summary

This paper proposes a practical and replicable decision-support framework to screen the technical fit of industrial installations for participation in electricity market mechanisms. The framework consists of five steps: defining the industrial installation, characterising its technical and operational constraints, identifying relevant flexibility mechanisms, mapping the key technical requirements of these mechanisms, and assessing the technical fit between both. The framework is designed as a low-threshold pre-feasibility tool for industrial players and technology providers. It translates a limited set of installation characteristics—such as power range, activation time, ramping capability, duration, recovery constraints, and availability—into a structured assessment of compatibility with different flexibility mechanisms. The approach covers balancing services, day-ahead and intraday markets, imbalance settlement, congestion management, and capacity remuneration mechanisms. The methodology is illustrated through a Belgian multi-sector case study covering stylized industrial installations – using fictitious but realistic data – in steel, metallurgy, chemicals, and food. Findings confirm that a limited set of technical parameters is sufficient for rapid pre-feasibility screening of industrial flexibility across multiple market mechanisms.

Presenting Author Biography

Brecht Ruttens is a researcher at VITO and EnergyVille, where he works on energy market modelling, electricity trading and portfolio management, energy pricing, and industrial flexibility. He holds a Master of Science in Energy Engineering from KU Leuven and brings 10 years of experience spanning industry, consulting, and research in the energy sector. At IAEE EU 2026, he will present his work on a practical decision-support framework for rapid technical feasibility screening of industrial flexibility for participation in electricity markets.