sweet swiss energy research for the energy transition

PATHFNDR

Market + policy

P+D: NEDELA
NEtwork tariffs for DEcentral LoAd control
Work package 4

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1 Summary

Optimizing Grid Costs: The need to reduce grid expansion costs by managing flexible loads like electric vehicles (EVs) and heat pumps (HPs) is critical.

Limitations of Static Tariffs: Most Swiss DSOs use static tariffs (e.g., constant high-low tariffs), offering imprecise incentives for load shifting.

Dynamic Tariffs as a Solution: Dynamic tariffs can signal grid bottlenecks more accurately but risk causing "herding" behavior and rebound peaks.

NEDELA's Aim: Implement an interface for transmitting dynamic tariffs to Home Energy Management Systems (HEMS) within Groupe-E's grid area.

Our Proposal: Develop and field-test dynamic tariffs to reduce grid peak loads through simulations and field studies.

2 Contribution to PATHFNDR

Flexibility Focus: Addressing flexibility on the demand side by managing flexible loads via dynamic tariffs.

Role in WP4: Implementing dynamic tariff designs and evaluating their impact on grid load and user acceptance.

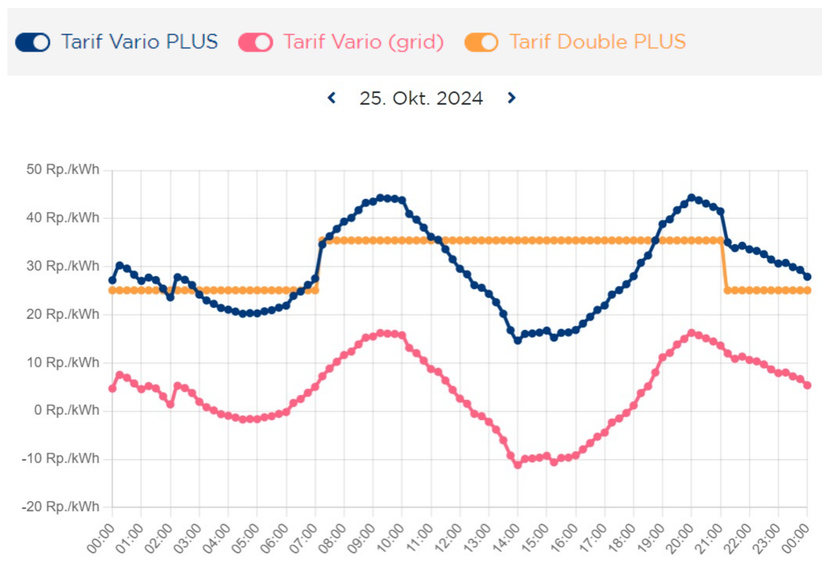
Link to WP7 : Participating in the joint review in the context of policies for flexibility.

3 Challenges with Current Tariff Designs

Imprecise Incentives: Static tariffs provide less accurate signals for shifting flexible loads to alleviate the grid.

Lack of Standardization: No commonly agreed-upon standard for transmitting dynamic tariff signals to market participants.

Risk of Rebound Peaks: Dynamic tariffs may lead to "herding" and unintended rebound peaks during low-tariff periods as more loads respond simultaneously.



Visualization of the effective tariffs (Groupe-E)

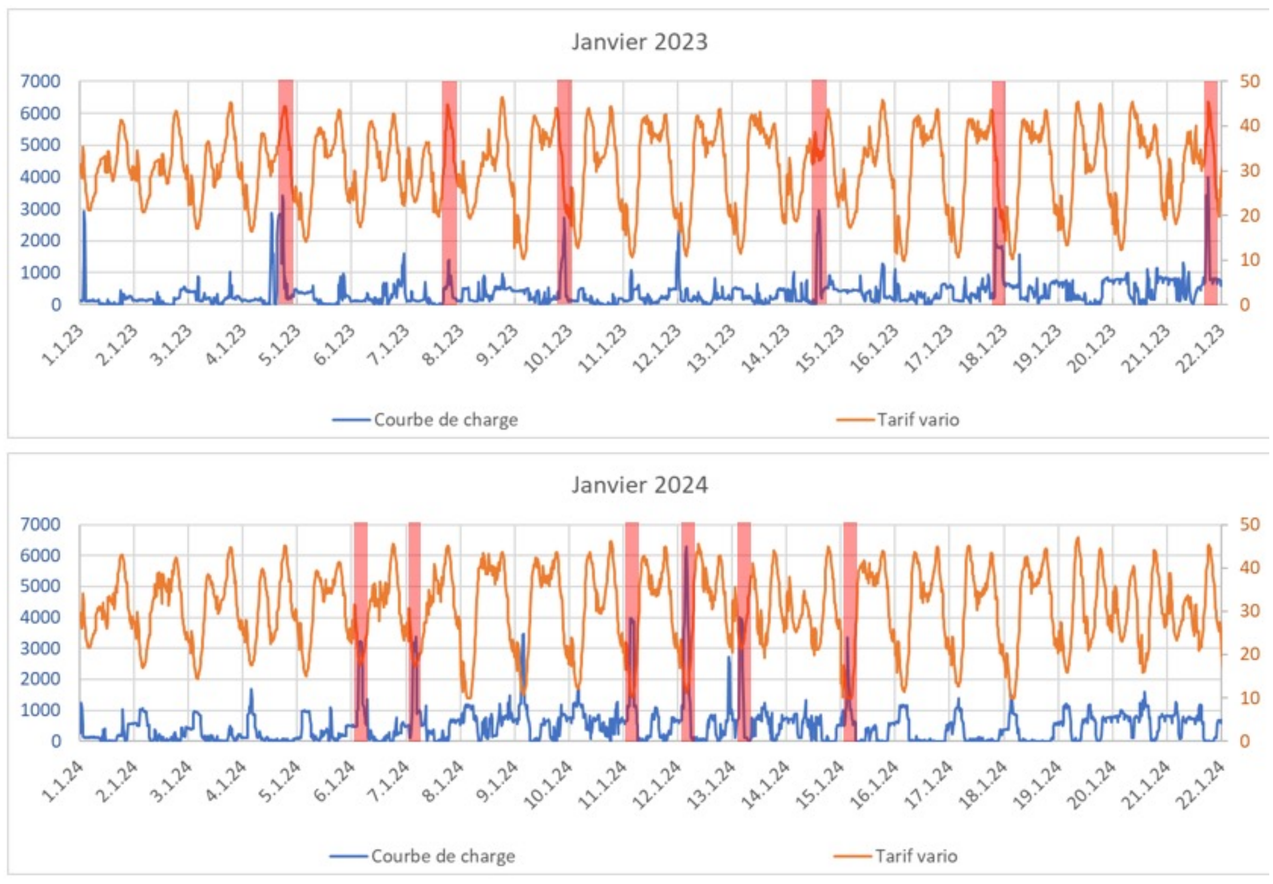
4 NEDELA's Approach

Objectives

- **Interface Development:** Identify a suitable industry standard for transmitting dynamic tariff signals to Home Energy Management Systems (HEMS).
- **Implementation Analysis:** Discover hurdles in introducing dynamic grid tariffs and implementing interfaces.
- **Effectiveness Evaluation:** Assess the impact of different tariff variations on maximum grid load and system costs.
- **Customer Acceptance:** Evaluate how end customers accept the new tariffs.

Implementation

- **WEB-API Development:** Created and tested a RESTful API for transmitting dynamic tariffs, agreed upon by multiple EMS providers.
- **Field Trials:** Initiated pilot projects on five test sites with four different EMS systems to assess real-world performance.
- **Launch of Vario Tariff:** Groupe-E developed and published the Vario dynamic tariff for 2024, implementing it in their billing system.



Load of a sample customer without (top) and with Vario tariff (bottom) (pilot)

REFERENCES

1 Vario Tarrif description at Group-E website: https://www.groupe-e.ch/de/energie/elektrizitaet/privatkunden/vario
2 Interim report in ARAMIS: https://www.aramis.admin.ch/Dokument.aspx?DocumentID=71957

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