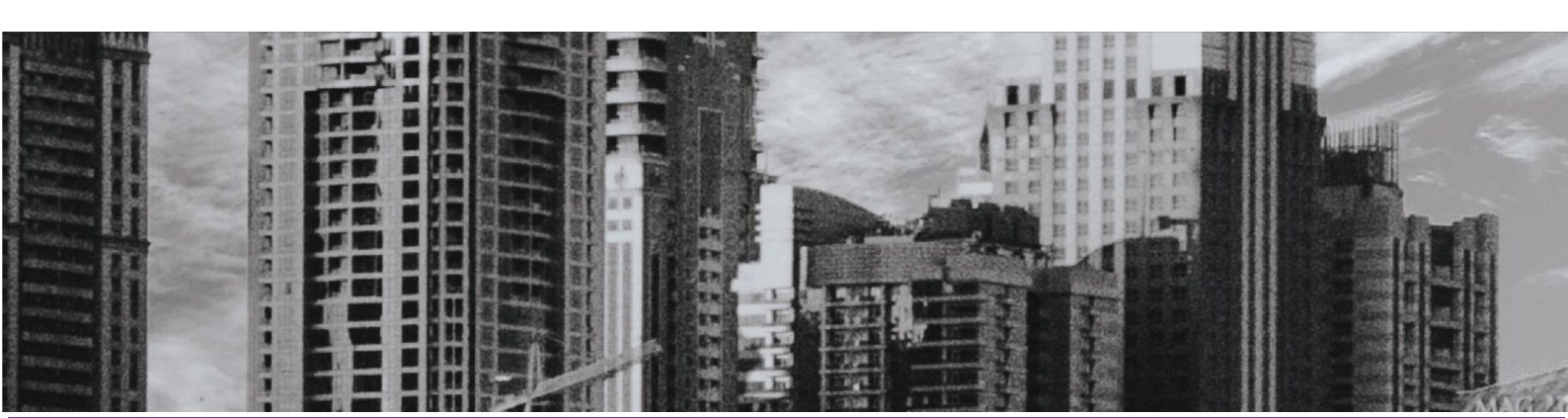




FEDECOM Internal Market Watch Newsletter Edition - Ed. No. 7 (Q3 2026)

Zia Lennard, R2M (WP8)

zia.lennard@r2msolution.com

BACKGROUND:

The first six editions investigated FEDECOM pilot countries (Ed. 1), the 15 Exploitable Results (Ed. 2), customer segments and business model archetypes (Ed. 3), energy trading (Ed. 4), blockchain, digital twins and citizen-led community enablers (Ed. 5), and deeper reviews of blockchain-based P2P trading and energy-community sector coupling (Ed. 6). The first four thematic pages in this edition are based on the four solution areas presented on the [FEDECOM solutions webpage](#).

CONTENTS:

> **Page 2. Decentralised Energy Exchange**

13 entries: 6 papers, 4 pilots, 3 market reviews

> **Page 3. Performance-Based Remuneration**

13 entries: 6 papers, 4 market-design studies, 3 policy programmes

> **Page 4. Forecasting Services and MPC Systems**

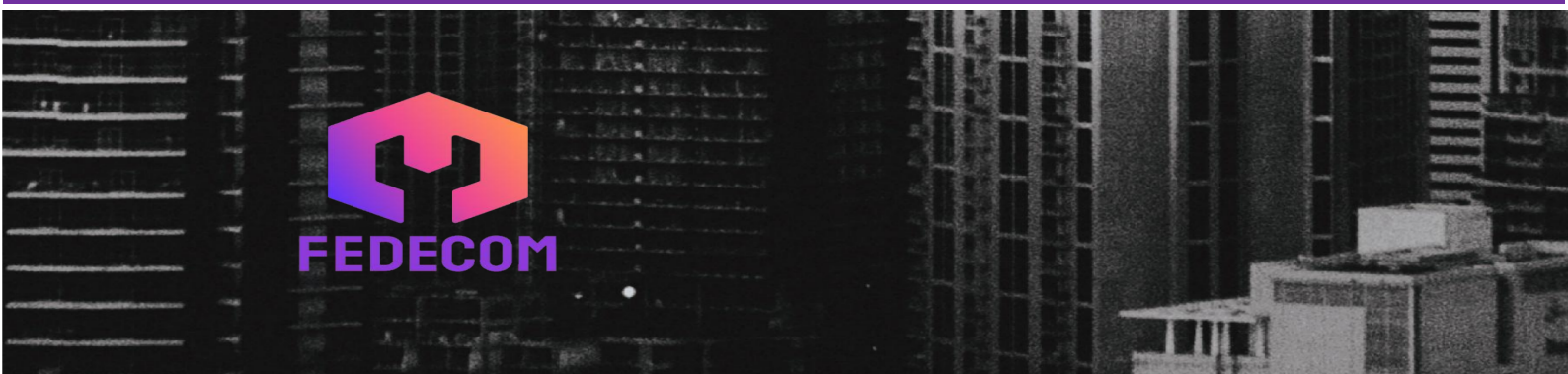
13 entries: 7 papers, 4 projects, 2 operational insights

> **Page 5. Data Interoperability and Developer Resources**

13 entries: 5 standards, 4 papers, 4 projects/resources

> **Page 6. Energy Communities: General Market Watch**

13 entries: 5 policy items, 4 programmes, 4 research/news items



Decentralised Energy Exchange

FEDECOM's GSY DEX combines topology-aware matching, separate execution and settlement, forecasting inputs and KPI-based verification. The market watch below tracks adjacent research, deployments and rule-making for decentralised electricity and flexibility exchange.

Academic Papers & Technical Studies

- **(July 2026, Scientific Reports): "GridTradeRL: a multi-agent deep reinforcement learning framework for decentralized peer-to-peer energy trading in smart grid prosumer networks"**; tests MA-TD3 trading in an eight-prosumer simulation and examines scaling to 64 prosumers; promising evidence, but not yet field validation.
- **(May 2026, Scientific Reports): "Hybrid market design for decentralized energy trading: multi-k double auction with enhanced stable matching"**; combines flexible double-auction pricing, constraint-aware stable matching and ant-colony optimisation on IEEE 13- and 37-node feeder data.
- **(February 2026, Energy Informatics): "Double-layer decentralized framework for local energy trading in the smart energy distribution network"**; uses Nash-bargaining scheduling and a second market layer to clear residual unmatched energy.
- **(March 2026, Scientific Reports): "A server-assisted secure blockchain model for residential demand response in smart grids"**; pairs secure central computation with private-Ethereum smart contracts, showing a pragmatic trade-off between speed and auditability.
- **(June 2026, Applied Energy): "Real-time peer-to-peer energy trading for multi-microgrids: improved double auction mechanism and prediction-free online trading approach"**; reduces real-time clearing burden through an improved auction and adaptive online optimisation, tested across 20 microgrids.
- **(April 2026, Energy Informatics): "Integrating distributed optimization algorithms into blockchain for P2P energy trading"**; implements asynchronous Replicator Dynamics with Ethereum smart contracts for privacy-aware dispatch and immutable settlement.

Pilots, Platforms & Deployments

- **(May 2026, CORDIS / LocalRES): "Blockchain-based Local P2P Energy Trading Platform (LETP)"**; publishes the marketplace architecture, software stack, user guidance and analysis for operation during degraded or islanded-grid conditions.
- **(March 2026, India Smart Grid Forum): "Interstate P2P Trading of Green Energy"**; documents Indian pilots, enabling regulation and the India Energy Stack pathway toward inter-DISCOM and interstate prosumer trading.
- **(February 2026, Delhi Electricity Regulatory Commission): "Order in Petition No. 02/2026 on P2P energy transactions"**; authorises a six-month pilot and sets the regulatory conditions for consumer-to-consumer solar trades in Delhi.
- **(2026, BSES Rajdhani Power): "Peer-to-Peer Energy Trading portal"**; sets out eligibility for smart-metered consumers and solar prosumers using a secure platform with trades reflected in utility billing.

Market Reviews & Platform Insights

- **(January 2026, Renewable and Sustainable Energy Reviews): "Local flexibility markets in Europe: a critical review of market designs, operational maturity and stakeholder perspectives"**; compares products, remuneration, baselines and operational maturity across European local flexibility markets.
- **(September 2025, Enlit / BeFlexible): "RECreation: a digital platform to manage energy communities with support for flexibility markets"**; adds baseline creation, flexibility bids, DER scheduling, settlement and billing to an energy-community management platform.
- **(October 2025, ISGAN): "Survey on Flexibility Market Implementation and Development"**; maps country practices, market maturity, perceived barriers and opportunities for DSO procurement of distributed flexibility.

Performance-Based Remuneration

FEDECOM links measured KPIs and tolerance bands to positive adjustments, shortfall penalties or hybrid remuneration, with auditable smart-contract settlement. These sources focus on fair allocation, baselines, verification and emerging flexibility-market rules.

Academic Papers & Remuneration Methods

- [\(2026, Building and Environment\)](#): "A performance-based incentive sharing mechanism for communities of residential end users leveraging an ontology-driven approach"; uses dynamic baselines and SAREF metadata; a seven-month, 13-user case rewards members who match community surplus more closely.
- [\(August 2026, Annals of Operations Research\)](#): "Optimal investment and fair sharing rules of incentives in virtual renewable energy communities"; links member investment decisions to a Nash-bargaining rule for allocating self-consumption incentives.
- [\(2025, Renewable Energy\)](#): "A fair dynamic incentive allocation method for virtual energy sharing in renewable energy communities"; proposes a time-varying reward allocation intended to distribute the value of shared electricity more equitably among users.
- [\(June 2026, arXiv\)](#): "A Coalitional Stable and Fair Reward Allocation for Dynamic Virtual Power Plants"; couples ancillary-service control with rewards designed for individual rationality, coalition stability, fairness and ex-post consistency.
- [\(June 2026, arXiv\)](#): "Fairness as an Investment: Dynamic Participation and Long-Run Profit in Virtual Power Plants"; models how fairer dispatch can strengthen future participation and aggregator value, while exposing short-run redistribution costs.
- [\(April 2026, arXiv\)](#): "Fair Aggregation in Virtual Power Plants"; compares energy, price and utility fairness within Stackelberg pricing, showing that the chosen fairness definition materially changes outcomes.

Market Design, Verification & Settlement

- [\(February 2026, EU DSO Entity\)](#): "Report on Distributed Flexibility Practices: Markets for Local Services"; documents real DSO approaches to baselines, delivered-service thresholds, over-delivery caps, penalties and settlement timing.
- [\(February 2026, EU Publications Office\)](#): "Specification and design criteria for local flexibility markets"; offers a unifying framework for products, procurement and implementation as Member States prepare scalable local markets.
- [\(2026, Energy Policy\)](#): "A comparative analysis of local flexibility markets in Europe: market design, performance, and regulatory alignment"; finds material differences in baseline methods, product competition, delivery remuneration and under-delivery penalties.
- [\(July 2026, CAISO\)](#): "Track 1 Draft Final Proposal: End-Use Customer Exports in Demand Response"; proposes a common settlement framework for approved end-use exports participating as demand-response resources in ISO markets.

Policy & Market Programmes

- [\(July 2026, UK Government\)](#): "Clean Flexibility Roadmap: July 2026 update"; targets compensation, duplicate-claim handling, delivery assurance, market access and clearer routes for consumer-led flexibility.
- [\(July 2026, ACER\)](#): "National flexibility needs assessment framework"; requires Member States to submit assessments in 2026 and use them to define indicative non-fossil flexibility targets by January 2027.
- [\(July 2026, Elexon\)](#): "Review of the 2026-2028 Market Facilitator Delivery Plan"; updates the programme for aligning Great Britain's local flexibility rules, data services and market coordination.

Forecasting Services and Model Predictive Control Systems

FEDECOM forecasts solar output, demand, prices and flexibility at asset and community level, then feeds those signals into MPC for batteries, buildings and thermal assets. The current market watch stresses uncertainty, privacy, planning horizons and operational demonstrations.

Academic Papers & Technical Studies

- [\(April 2026, Applied Energy\)](#): "Dynamic adaptive model predictive control for prosumers-based energy communities"; adapts MPC decisions to changing operating conditions and benchmarks cost, losses and renewable utilisation against fixed-MPC alternatives.
- [\(January 2026, arXiv\)](#): "Forecasting Energy Availability in Local Energy Communities via LSTM Federated Learning"; keeps participant data local while training a shared forecast model, making privacy-versus-accuracy trade-offs explicit.
- [\(June 2026, Preprints.org\)](#): "Zero-Shot Weekly Load Forecasting for the Early-Stage Energy Community"; tests TiRex against persistence and Chronos on measured community residual load, targeting the cold-start problem.
- [\(2026, Energy Efficiency\)](#): "Physical-based models and load forecasting to improve household energy management"; combines probabilistic demand estimation with demand-management policies for small customer aggregations.
- [\(April 2026, arXiv\)](#): "Mapping High-Performance Regions in Battery Scheduling across Data Uncertainty, Battery Design, and Planning Horizons"; shows that forecast uncertainty, battery characteristics and look-ahead length jointly determine MPC value and computational effort.
- [\(June 2026, arXiv\)](#): "Forecast and Model Predictive Control of Distributed Energy Resource Aggregators for Net-Demand Balancing"; represents DER aggregations as virtual batteries and studies the interaction between forecast horizon and rolling-MPC update rate.
- [\(July 2026, arXiv\)](#): "Forecast-Assisted Deep Reinforcement Learning for Energy Management of Hydrogen-Enabled Community Microgrids"; reports proof-of-concept gains from forecast-enriched control, while openly noting weak forecast calibration and limited validation.

EU Projects & Demonstrations

- [\(2026, CORDIS / INTEREST\)](#): "Integrated Digital Solution for Sustainable and Reliable Management of Renewable and Multi-Carrier Energy Systems"; develops digital twins, forecasting and hierarchical distributed MPC from asset and community level to the distribution system.
- [\(July 2026, InterPED / Enlit\)](#): "How predictive analytics can unlock smarter positive energy districts"; forecasts electrical demand, thermal demand, renewable output and EV charging to feed MPC and flexibility orchestration across four pilots.
- [\(June 2026, CORDIS / SUSTENANCE\)](#): "Developed models and control schemes for smart integration of energy carriers"; coordinates electricity-to-heat systems, EVs, heat pumps, boilers and storage for local multi-carrier operation.
- [\(2026, CORDIS / EXCESS\)](#): "EXCESS Model-Predictive Control Algorithms"; provides a building-MPC framework and optimisation logic for assessing alternative positive-energy-building control scenarios.

Industry & Operational Insights

- [\(May 2026, Carbon Direct\)](#): "Rethinking load forecasting for a changing grid"; argues for probabilistic, frequently refreshed, category-specific forecasts and standardised large-load data instead of single deterministic peaks.
- [\(June 2026, ESIG\)](#): "2026 Summer Workshops: Forecasting, Grid Solutions, and Large Loads"; brings forecasters and operators together around extreme weather, large-load growth, renewable variability and practical forecast integration.

Data Interoperability and Developer Resources

FEDECOM connects field devices, optimisation services and external actors through OpenMUC middleware, secure APIs, identity controls and an ontology that reuses SAREF, Brick and BOT. This page tracks the standards, research and open resources shaping that interoperability layer.

Policy, Standards & Industry Alliances

- [\(June 2026, European Commission\)](#): "**Strategic Roadmap for Digitalisation and AI in the Energy Sector**"; sets a framework for interoperable cross-border energy data exchange, data spaces, digital twins and secure AI-enabled grid services.
- [\(March 2026, European Commission JRC\)](#): "**Energy smart appliances: Code of Conduct expands coverage, promoting interoperability**"; extends common communication requirements to more appliance classes for consistent interaction with energy-management systems and grids.
- [\(April 2026, DLMS UA and OpenADR Alliance\)](#): "**Agreement to strengthen interoperable smart-meter data exchange at the grid edge**"; aligns DLMS/COSEM metering data with OpenADR signalling for demand response, DERs and flexibility services.
- [\(May 2026, Connectivity Standards Alliance and OpenADR Alliance\)](#): "**Liaison agreement on grid-connected energy management**"; connects Matter-based in-home devices and gateways with OpenADR grid signals to reduce protocol fragmentation.
- [\(2026, Interoperable Europe\)](#): "**Rolling Plan for ICT Standardisation 2026**"; coordinates about 260 standardisation actions across 40 domains, with updated emphasis on data economy and cybersecurity.

Research Papers & Semantic Methods

- [\(2026, Current Sustainable/Renewable Energy Reports\)](#): "**The Common European Energy Data Space and the energy networks**"; examines a federated, sovereign and trusted data-sharing ecosystem across actors, countries and operational processes.
- [\(2026, Energy Informatics\)](#): "**Systematic review of ontologies in the energy domain to enable knowledge representation in local electricity markets**"; screens 78 works and evaluates 26 ontologies for their usefulness in local-market knowledge representation.
- [\(June 2026, arXiv\)](#): "**Brick-DICL: Dynamic In-Context Learning for Automated Brick Schema Classification**"; uses metadata retrieval, class refinement and multi-model filtering to accelerate BMS point mapping while retaining human review.
- [\(March 2026, Open Conference Proceedings\)](#): "**Interoperability for Energy-Related Ontologies**"; presents the ENERO Foundry as a coordinated set of principles for reusable, compatible energy-domain ontologies.

Projects & Open Developer Resources

- [\(May 2026, CORDIS / int:net\)](#): "**Interoperability Network for the Energy Transition**"; publishes a multidimensional interoperability roadmap, SGAM tooling and practical use-case methods for energy-system integration.
- [\(December 2025, CORDIS / ENERSHARE\)](#): "**European common energy data-space framework**"; delivers a vocabulary hub, open-API tooling, data mash-up, compliance and transformation services for cross-stakeholder exchange.
- [\(Developer resource, OpenMUC\)](#): "**OpenMUC framework and protocol libraries**"; offers a modular Java/OSGi foundation for monitoring, logging and control while abstracting communication and data-logging technologies.
- [\(Open standards, ETSI SAREF and Brick\)](#): "**Shared semantic models for IoT and buildings**"; provide complementary open vocabularies for devices, assets, spaces, systems and relationships used by interoperable analytics and control.

Energy Communities: General Market Watch

Wider energy-community activity in 2026 is moving from broad recognition to implementation: national enabling frameworks, finance, grid access, community governance and fair value sharing now determine whether local projects scale.

EU Policy, Regulation & Sector Reports

- **(March 2026, European Commission): "Citizens Energy Package"**; sets nine actions on affordability, consumer protection, energy sharing, communities, flexibility and implementation of existing EU law.
- **(April 2026, European Commission): "Recommendation on supporting energy communities and maximising self-consumption"**; pairs guidance with an action plan covering enabling frameworks, finance, capacity building, inclusion and digital system integration.
- **(March 2026, European Court of Auditors): "Special Report 10/2026: Energy communities - Potential yet to be fulfilled"**; finds deployment slowed by unclear objectives, weak monitoring, regulatory gaps and grid-connection delays.
- **(January 2026, DUT Partnership): "Energy Communities at a Crossroads: EU Policy Barriers and Recommendations"**; compares barriers in Denmark, the Netherlands, Portugal and Norway and calls for citizen-support strategies and practical legal help.
- **(January 2026, Energy Community Regulatory Board): "Update on renewable and flexibility regulation in Contracting Parties"**; tracks market-based support, self-consumption, energy-community schemes, guarantees of origin and persistent grid-access challenges.

Funding, Programmes & Projects

- **(April 2026, CINEA): "LIFE-2026-CET-ENERCOM: Facilitating cooperation among energy communities"**; opens an EU call focused on cooperation and scaling, with a 16 September 2026 application deadline.
- **(May 2026, European Energy Communities Facility): "Second call for EUR 45,000 business-plan grants"**; supports technical, financial, legal and administrative pre-development; 144 communities are due support across the first two calls.
- **(February 2026, Great British Energy): "Local Power Plan"**; commits up to GBP 1 billion and direct support for at least 1,000 local and community energy projects by 2030.
- **(January 2026, CINEA / LIFE COMANAGE): "Breathing new LIFE into struggling energy communities"**; shares governance tools, training and support from pilots in Barcelona, Krakow and Lazio aimed at escaping the pilot trap.

Research, Cases & Market News

- **(2026, Energy Research & Social Science): "Can intelligent Renewable Energy Communities deliver on equity for a just energy transition? A policy oriented demonstrator analysis"**; uses a policy-oriented demonstrator analysis to assess performance and equity, mapping the technical, regulatory and social barriers that still limit wider deployment.
- **(April 2026, arXiv): "From Individual Consumers to Energy Communities: A Techno-economic Assessment of Swiss Local Electricity Communities"**; shows that internal pricing shapes the trade-off between renewable self-use, overall efficiency and fair benefit distribution.
- **(February 2026, Energies): "Financial Opportunities and Challenges in Energy Communities: Revenue, Costs, and Capital Structures"**; reviews 89 studies and highlights the shift from fixed incentives toward market-responsive revenue and more structured capital stacks.
- **(July 2026, The Guardian): "Britain's biggest community solar farm forced to shut over grid overload fears"**; Derril Water's curtailment illustrates how delayed network upgrades can overwhelm an otherwise financeable community asset.