Scientific Research Publishing

Open Journal of Social Sciences, 2024, *, *-*
https://www.scirp.org/journal/jss
ISSN Online: 2327-5960
ISSN Print: 2327-5952

"The role of the Energy Cluster of the Valencian Community as an orchestrator within an innovation ecosystem."

ENRIQUE BAYONNE, PhD. Universidad Europea de Valencia. enrique.bayonne@universidadeuropea.es

BEATRIZ IRÚN MOLINA, PhD. Universitat Jaume I, ESIC Business & Marketing School. birun@uji.es.

PALOMA MOYA, PhD. Universidad a Distancia de Madrid. paloma.moya@udima.es

ENRIQUE BAYONNE, PhD.
Universidad Europea de Valencia. enrique.bayonne@universidadeuropea.es

BEATRIZ IRÚN MOLINA, PhD.
Universitat Jaume I, ESIC Business & Marketing School. birun@uji.es

PALOMA MOYA, PhD.
Universidad a Distancia de Madrid. paloma.moya@udima.es

"The role of the Energy Cluster of the Valencian Community as an orchestrator within an innovation ecosystem."

Received: **** **, ***
Accepted: **** **, ***
Published: **** **, ***

Abstract

In a context of accelerated industrial transformation driven by digitalization, the energy transition, and increasing pressure for sustainability, clusters have emerged as key actors in the articulation of innovation ecosystems (Irún et al, 2022). Their role has evolved from simple sectoral groupings into strategic coordination platforms capable of catalyzing collaborative processes among companies, technology centers, universities, and public administrations (Cooke, 2001).

A cluster is a geographic concentration of companies, institutions, and interrelated organizations operating within the same sector or value chain, which collaborate to enhance competitiveness, foster innovation, and generate productive synergies (Porter, 1998).

The Energy Cluster of the Valencian Community (CECV) in Spain has developed the program named CECVImpulsaIA360, a pioneering initiative that integrates generative artificial intelligence, sustainability, and industrial digitalization to accelerate technological transition in energy-intensive sectors. The program is structured into six phases—from territorial prospecting and needs diagnosis, to challenge prioritization, solution mapping, collaborative pilot design and execution, and impact evaluation—and aligns with the Valencian Strategy for Artificial Intelligence and the European Next Generation EU funds (CECV, 2025). This approach has enabled the identification of specific challenges in key high-energy-consumption sectors (agri-food; ceramics and glass; chemicals and petrochemicals; steel and metallurgy; paper and pulp) and their connection to technological solutions offered by companies within the cluster.

The annual event Impacto+, organized within the framework of the program, and the academic award for the best Bachelor's and Master's theses in the field of "Energy and AI" reinforce the program's educational and outreach dimension, fostering interaction between companies, technology centers, and universities. Participation in national and international conferences and the publication of results in research and knowledge transfer journals will contribute to systematizing and disseminating the knowledge generated in the management of this innovation ecosystem led by the CECV.

This ecosystem is continuously self-reinforcing. In fact, the design of CECVImpulsaIA360 emerged from a structured listening process to the productive fabric of the Valencian Community (including technology breakfasts, bilateral meetings, working groups, and B2B sessions), where energy-intensive companies from various sectors expressed recurring energy and sustainability challenges: reducing consumption and costs, improving efficiency and competitiveness, predictive maintenance, waste valorization, and process digitalization (CECV, 2021; CECV, 2022).

The event Artificial Intelligence in the Energy Sector (co-organized with ValgrAI in 2025) confirmed the traction of the AI-energy approach and helped prioritize lines of action such as predictive demand models, digital twins for efficiency, and automation of energy decision-making. These findings reinforced the need for a comprehensive program focused on use cases and scalability.

The convergence of these challenges with the capabilities of the CECV's business base (SMEs and digital/energy startups, technology centers, and universities), and with European priorities for green transition and digital transformation, led the CECV to structure a phased response—from prospecting and competitive advantage analysis, to challenge and solution identification, annual event organization, and academic dissemination of results, including awards for the best theses in this field to attract talent—with AI as a transversal enabler.

The program articulates a collaborative value chain: it identifies "on-site" challenges in large energy consumers, matches them with technological capabilities (AI, IoT, digital twins, storage, circular economy), and orchestrates meetings and demonstrator projects that serve as a basis for scaling, supported by the communication and transfer platform ComunicaEnergía as a channel for visibility and dissemination (Irún et al, 2020).

Looking ahead, clusters must adapt to increasingly complex scenarios, such as generative artificial intelligence, the energy transition, and the geopolitical reconfiguration of value chains. Based on the CECV's experience, effective orchestration relies on: (i) early and continuous detection of demand-side needs; (ii) agile methodology to move from challenge to pilot with efficiency and CO_2 KPIs; (iii) transfer platforms (events, awards, content) that attract talent and visibility; and (iv) inter-cluster and international networks to scale solutions. CECVImpulsaIA360 encapsulates this logic and aligns AI + energy transition with academic-business dissemination to maximize territorial impact.

Keywords

Energy clusters, Innovation ecosystems, Generative artificial intelligence Industrial digitalization, Sustainability transition, Collaborative pilots, Technology orchestration, Knowledge transfer, CECV, CECVIA360 program.

Acknowledgements

This project has been funded by the INENTI program (Innovation Boost in Industrial Sectors), promoted by the Generalitat Valenciana, as part of the support scheme for business associations driving reindustrialization and digital transformation in strategic sectors, reinforcing its alignment with continental strategies for digital transformation and sustainability.

The CECVImpulsaIA360 program aims to accelerate the adoption of highly innovative solutions in which the use of Artificial Intelligence (AI) plays a key role within energy-intensive industrial sectors. Its objectives include optimizing resource use, reducing greenhouse gas (GHG) emissions, and enhancing competitiveness, in alignment with:

- The European Green Deal
- The Fit for 55 climate target of a 55% reduction in emissions by 2030
- The European Roadmap for Low-Carbon Industrial Technologies (ERA, 2022)
- The Spanish Artificial Intelligence Strategy (2020, Ministry of Economic Affairs and Digital Transformation)

The program's 360º approach involves acting across the entire industrial value chain: operations, maintenance, logistics, waste management and valorization, integration of renewable energy sources, and the training of technical human capital.

References

CECV (2021). Generating new business opportunities for companies in the energy sector in the Chinese and Hong Kong markets through innovation and sustainability strategies. Within the call for grants to support non-economic activities that promote the reindustrialization of the Valencian Community, developed by industrial business associations linked to certain sectors of the Valencian Community, including the energy sector, for the 2021 financial year. File 2021/34.

CECV (2022). CECV4SUSTAGRIFOOD. Open innovation strategies to promote collaborative projects and environmental sustainability in the agrifood sector. Within the call for grants to support non-economic activities that promote the reindustrialization of the Valencian Community, developed by industrial business associations linked to certain sectors in the Valencian Community, including the energy sector, for the 2022 financial year. Funding body: Valencian Regional Government through the Regional Ministry of Innovation, Industry, Trade, and Tourism. File 2022/34.

CECV (2025). CECVImpulsaIA360. Impact of AI on sustainable and digital transformation in energy-intensive sectors. Within the call for grants to support non-economic activities that promote the reindustrialization of the Valencian Community, developed by industrial business associations linked to certain sectors in the Valencian Community, including the energy sector, for the 2025 financial year. Funding body: Valencian Regional Government through the Regional Ministry of Innovation, Industry, Trade, and Tourism. File 2025/26.

Cooke, P. (2001). Regional innovation systems, clusters, and the knowledge economy. Industrial and Corporate Change, 10(4), 945-974. https://doi.org/10.1093/icc/10.4.945

Irún, B., Moya, P., Monferrer, D., & Moliner, M.A., Bayonne, E. (2022). "The Key Role of European Clusters as Innovation Ecosystems, and their Implication in the Successful International Promotion of the Member Companies in the Strategic Chinese Sectors: Net-zero and Smart Cities, Smart Ports and Smart Factories". In Public Private Partnership trends (book chapter). Nova science Publisher (2022).

Irún, B., Moya, P., Monferrer, D., Moliner, MA., Bayonne, E. "Smart cities, Smart factories y Smart ports en las provincias chinas de Guangdong y Hainan: Oportunidades para las empresas extranjeras". Published in the electronic book "Impacts of technologies in applied social sciences 4". Atena Editora, 2022.

Irún, B., Monferrer, D., & Moliner, M.A. Network market orientation as a relational governance mechanism to public-private partnerships. Journal of Business Research, 121, 268-282. Journal of Business Research, 2020.

Porter, M. E. (1998). Clusters and the new economics of competition. Harvard Business Review.