

Oil and Gas Tower Metaphor in Bojonegoro's Creative Economy Facility

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ABSTRACT

Bojonegoro is widely known as an oil and gas producing region, marked by traditional drilling towers still standing in the Wonocolo area. This identity has not yet been developed into a city landmark supporting the local creative economy. This study formulates a concept for transforming the form and meaning of the oil and gas tower into a creative economy facility functioning as a visual icon for Bojonegoro. A descriptive qualitative approach was applied through a combined metaphor design method, merging the tower's concrete visual elements with the abstract values of productivity and communal spirit held by local miners. Data were gathered through field observation of the towers and five leading craft centers, literature review, precedent study, and visual documentation, then analyzed through element identification, abstraction, and design reinterpretation. Findings show that the tower's vertical form, cross-braced frame, and mechanical character can be translated into a landmark tower twenty to twenty-five meters tall with a frame-patterned facade, accommodating production, training, and marketing spaces for five featured crafts within a total floor area of about 4,950 square meters. The resulting concept, the Industrial Creative Tower, is expected to strengthen Bojonegoro's image while providing growth space for craft-based creative economy.

Keywords: Architectural Metaphor, Tower Transformation, Creative Economy, City Landmark, Bojonegoro Craft

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INTRODUCTION

Bojonegoro is a regency in East Java that has long been known as an oil and natural gas-producing region. This identity is not only evident in the historical records of the community-based mining industry but is also physically manifested through the traditional drilling towers that still stand in the Wonocolo area of Kedewan District. These wooden towers bear witness to the oil mining practices carried out by the local community for generations, and to this day remain deeply embedded in the collective memory of residents as part of the city's character. However, this visual and historical significance has not yet been fully translated into a representative urban landmark. According to the concept of "imageability" proposed by Lynch (1960), a city is more easily recognized and remembered when it possesses clear image-forming elements, one of which is a landmark that stands

out prominently and contrasts with its surroundings. Bojonegoro, with its rich oil and gas identity, actually possesses strong potential to develop such landmarks; however, this potential has not yet been optimally harnessed in its urban spatial planning, as also mandated by the 2021–2041 Bojonegoro Regency Spatial Plan, which designates the urban area as a center for economic and service growth (Bojonegoro Regency Government, 2021).

The choice of combined metaphors as a design method is also based on the consideration that urban landmarks do not always have to exhibit a direct correspondence between a building's form and function. A number of world-renowned landmarks, such as the Guggenheim Museum in Bilbao and the Centre Pompidou in Paris, demonstrate that the tension between an architectural form and its functional program can actually enhance a building's memorability and uniqueness within the city. This argument serves as one of the foundational premises of this research: that transforming the form of an oil and gas tower originally an extractive industry infrastructure into a visitor friendly creative economy facility can actually produce a more memorable landmark than conventional design approaches.

On the other hand, the creative economy has become one of the sectors that local governments continue to promote as a new engine of growth. Howkins (2001) defines the creative economy as activities that generate and manage economic value from creativity, innovation, and intellectual property; thus, this sector is highly dependent on the availability of spaces capable of accommodating the production, training, and marketing of creative products. In 2017, the Creative Economy Agency designated five types of flagship crafts in Bojonegoro Regency through the "Innovative and Creative through Nusantara Collaboration" program: pottery in Rendeng Village, onyx stone in Jari Village, Jonegoroan batik in several subdistricts, bamboo weaving in Tondomulo Village, and teak wood waste crafts in Sukorejo and Batokan Villages (Sudarmojo, 2017). These five crafts continue to thrive; Bojonegoro's teak wood products, for example, have now penetrated export markets in France, the Netherlands, Spain, South Korea, and even Africa, with sales revenue steadily increasing (Bojonegoro Regency Government, 2025). Unfortunately, this great potential has not yet been matched by the availability of integrated facilities capable of bringing together the production, training, and promotion of these five crafts under one representative and iconic roof.

This issue becomes even more relevant when considered in light of the current situation of the five craft centers, which remain scattered across various subdistricts without clear spatial connections. The pottery center in Rendeng, the onyx stone center in Jari, the batik centers in Jono and Dolokgede, the bamboo weaving center in Tondomulo, and the teak woodcraft centers in Sukorejo and Batokan each operate independently on a small-scale, home-based production level, resulting in training, design development, and product marketing processes that proceed in isolation. In fact, the export revenue from Bojonegoro's teak wood crafts which once reached hundreds of billions of rupiah in a single year demonstrates that market demand for this region's creative products is substantial. Consequently, the lack of integrated production and promotional spaces has become one of the primary obstacles that must be addressed immediately (Tempo.co, 2018). This

situation underscores the urgent need for a single integrated facility that can also serve as a visual showcase for the city.

Metaphorical architecture offers a relevant approach to bridging the need to create a city landmark while also providing functional facilities for the creative economy. Antoniades (1990) explains that metaphors in architecture can be categorized into concrete metaphors derived from tangible visual forms, abstract metaphors derived from values or ideas, and combined metaphors that integrate both. The combined approach is considered most suitable for Bojonegoro because it allows designers to translate the physical form of the oil and gas tower along with the values of productivity and community cooperation among the mining community into a creative economy spatial program. Previous research on architectural metaphors such as in the design of a sports arena in Kebumen demonstrates how a single source object of a metaphor can be consistently translated into elements of form, structure, and even the spatial experience of a building (Bakti, Samsudi, & Setyawan, 2018). A similar approach was also observed in the design of a metaphor-based creative space center in Yogyakarta, demonstrating that this method is effective for creating creative economy facilities that also serve as regional icons (Pefrina & Nuryanti, 2023).

Based on the above discussion, this study was designed to answer the following question: How can the metaphorical elements of oil and gas towers be transformed into the design of a creative economy facility that serves as a landmark symbolizing the identity of Bojonegoro City? The objective of this study is to formulate a concept for transforming the metaphor of oil and gas towers into the design of a flagship creative economy facility that reflects the character and identity of Bojonegoro City. Academically, this study is expected to enrich the study of architectural metaphors in the context of designing public facilities based on local identity, while practically, the resulting concept can serve as a reference for the development of creative economy infrastructure in Bojonegoro.

METHOD

This study employs a descriptive qualitative approach within the framework of architectural research as developed by Groat and Wang (2013), which emphasizes a deep understanding of the meaning, context, and processes behind a design object before they are translated into design decisions. This strategy was chosen because the research objective is not to statistically test relationships between variables, but rather to comprehensively understand how the visual elements and non-physical values of oil and gas towers can be translated into spatial programs and architectural forms. The research design was structured in five stages: identification of source elements for metaphors; analysis of their metaphorical characteristics; conceptual transformation through analogy and reinterpretation; design development based on the spatial needs of the creative economy; and evaluation of the final concept, following the combined metaphor framework developed by Antoniades (1990).

The subjects of this study consist of two groups of research objects. The first group consists of the sources of metaphors, namely traditional oil and gas derricks located in the Wonocolo community mining area, Kedewan Subdistrict, Bojonegoro Regency. The second

group consists of the design targets, namely five leading craft centers that have been designated as priority products of Bojonegoro Regency, including pottery in Rendeng Village, onyx stone in Jari Village, Jonegoroan batik in several subdistricts, bamboo weaving in Tondomulo Village, and teak wood waste in Sukorejo and Batokan Villages (Sudarmojo, 2017). Given that this is a case-study-based design research, the population is understood as the totality of oil and gas towers and craft centers in the Bojonegoro region, while the sample was selected purposively based on criteria including sites with the most comprehensive visual documentation, locations representative of the regency's character, and direct relevance to the designation of regional flagship crafts. In addition to physical sites, this study also drew on supporting sources in the form of official local government documents to strengthen the understanding of the local creative economy context.

Data collection was conducted using four main techniques. First, field observations of the existing conditions of traditional oil and gas towers and craft centers to document their form, structure, materials, and the activities taking place within them. Second, a literature review of metaphorical architecture theory (Antoniades, 1990; Ashadi, 2019), landmark and city image theory (Lynch, 1960), and creative economy theory (Howkins, 2001) served as the conceptual framework for the research. Third, a case study of buildings that have successfully applied the metaphorical architecture approach, serving as a benchmark for form transformation strategies (Bakti, Samsudi, & Setyawan, 2018). Fourth, visual documentation in the form of photographs and sketches of oil and gas tower elements and handicraft production activities, which serve as the basis for the form abstraction process during the analysis phase. Secondary data regarding the achievements and development of the five flagship crafts were also collected from official local government reports and mass media to strengthen the justification for the designed spatial program (Bojonegoro Regency Government, 2025; Tempo.co, 2018).

Data analysis was conducted using a descriptive qualitative approach in three stages. The first stage involved data reduction and categorization, specifically sorting the elements of oil and gas towers into two metaphorical categories as outlined by Antoniades (1990): concrete elements, which include vertical forms, structural frameworks, mechanical systems, and materials; and abstract elements, which include productivity values, a spirit of cooperation, and local identity. The second stage is transformational analysis, which involves translating each element through processes of analogy, abstraction, and reinterpretation into an architectural language relevant to the creative economy. The third stage is design synthesis, which involves integrating all the results of the transformation into a cohesive design concept, encompassing building form, spatial zoning, and landmark strategies, which are then evaluated for their alignment with Lynch's (1960) landmark principles as well as the spatial requirements of Bojonegoro's five flagship crafts, with reference to standard dimensions for workspaces and circulation (Neufert, 1996).

FINDING AND DISCUSSION



Figure 1. *Wonocolo Traditional Oil and Gas Tower, Bojonegoro*
Source : globalenergi.co

An analysis of traditional oil and gas derricks in the Wonocolo area revealed seven key elements that could serve as sources of metaphor, consisting of four concrete elements and three abstract elements. The concrete elements include the vertical, towering shape of the derricks with simple frame structures resembling tripods or A-frames; a crisscrossing wooden frame system that gives a rustic impression and is not perfectly symmetrical; traditional mechanical systems consisting of pulleys and wooden wheels operated manually; and local materials such as wood and rustic metal that have faded in color due to weather and oil. The abstract elements include the productive value of communal extraction activities, the spirit of mutual cooperation among miners, and the local Bojonegoro identity inherent in the Wonocolo area as a symbol of the people's oil and gas history. This combination of concrete and abstract elements confirms that the Bojonegoro oil and gas tower is a composite metaphorical object that falls under the third category in Antoniades's theory (1990).

The transformation process of these seven elements resulted in a design concept called the Industrial Creative Tower. This concept does not replicate the Wonocolo wooden tower in its entirety, but rather captures its visual essence namely, the silhouette of the A-frame structure, the cross-bracing pattern, and the mechanical aesthetic and translates it into a modern building with a steel-and-concrete structure that retains its rural industrial character as a defining feature. The landmark tower is designed to be 2025 meters tall, with a facade featuring a cross braced pattern that serves as both an aesthetic element and a shading device, while the values of productivity and mutual cooperation are translated into a spatial program comprising workshops, collaboration spaces, and a community plaza.

Table 1 summarizes the identification matrix of oil and gas tower elements along with their transformation into architectural design, while Figure 2 visualizes the concept of the building's vertical zoning, which translates the oil and gas tower structure into a floor layout from the public zone on the ground floor to the innovation zone and viewing deck

on the rooftop. This zoning arrangement depicts a spatial journey that mirrors the tower's structure: from the base, which is open to the public, ascending to the more technical and specialized production floors, up to the summit, which serves as a collaborative space and a vantage point overlooking the city.

Table 1. Transformation Matrix of Oil and Gas Tower Elements into Architectural Design

No	Oil and Gas Tower Element	Characteristics	Design Transformation	Metaphor Type
1	Vertical Form	Soaring structure with simple tripod/A-frame	20-25 m landmark tower as the main visual marker	Concrete
2	Wooden Frame Structure	Cross-bracing, rustic and imperfectly symmetrical appearance	Cross-frame facade motif as both pattern and shading device	Concrete
3	Mechanical System	Manually operated pulleys, ropes, and wooden wheels	Expressive staircase and interactive pulley-themed installation	Concrete
4	Local Material	Wood, bamboo, and rustic metal faded by weather	Exposed natural material with rustic-modern finishing	Concrete
5	Productivity Value	Communal extraction activity, simple but sustained production	Community-based workshop and production spaces	Abstract
6	Spirit of Mutual Cooperation	Culture of working together and hereditary skills among miners	Community plaza and open collaboration space	Abstract
7	Local Identity	Visual icon of Wonocolo, symbol of Bojonegoro's people's oil and gas history	Cultural exhibition zone and thematic oil-and-gas-history signage	Abstract

Source: Research Analysis, 2025

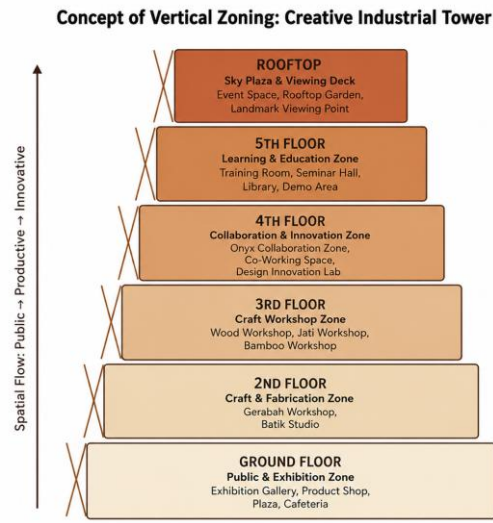


Figure 2 Concept of Vertical Zoning :
Creative Industrial Tower
Source : Research Design Concpt, 2025

Quantitatively, the design of this creative economy facility accommodates five flagship crafts within a total program area of approximately 4,950 m², with a capacity of about 700 people at full operational capacity. The allocation of space for each zone is based on standards for workspace size and pedestrian circulation (Neufert, 1996), combined with the technical requirements of each craft type for example, the need for a firing area for pottery, a dyeing and drying area for batik, and a cutting and carving area for onyx. Table 2 shows the detailed profiles of the five flagship crafts along with the allocated workshop areas for each. The teak wood zone received the largest allocation, namely 450 m², in line with the high export demand for Bojonegoro teak wood products, which have penetrated European and American markets (Bojonegoro Regency Government, 2025b), while the Jonegoroan batik zone is allocated 350 m² to accommodate the diversity of twenty distinctive batik motifs that have been developed since 2009 as part of the city's visual identity (Radar Bojonegoro-Jawa Pos, 2025).

Table 2. Profile and Spatial Program of Bojonegoro's Five Leading Crafts

No	Zone/Craft	Center Location	Main Facilities	Area (m2)
1	Pottery	Rendeng Village, Malo Subdistrict	Forming, firing, and finishing workshop	180
2	Onyx Stone	Jari Village, Gondang Subdistrict	Cutting, carving, and polishing workshop	150
3	Jonegoroan Batik	Jono & Temayang Villages	Canting studio, dyeing, drying, and gallery	350
4	Bamboo Weaving	Sugihwaras Village, Ngraho Subdistrict	Production and finishing workshop for weaving	120

5	Teak Wood Waste	Geneng Villages, Margomulyo Subdistrict	Carpentry, finishing, and showroom	450
6	Collaboration & Innovation	Integrated within the building	Co-working space, design innovation lab, digital lab	570
7	Training & Education	Integrated within the building	Training room, seminar hall, and library	600
8	Commercial & Display	Integrated within the building	Exhibition gallery, retail, and e-commerce center	830
9	Public & Service	Integrated within the building	Plaza, cafeteria, lobby, and parking area	1,700
TOTAL				4,950

Source: Research Analysis based on Craft Workshop Standards and Precedent Studies, 2025

In addition to data on floor area and capacity, this study also provides quantitative projections of the facility's impact on the city. Based on an analysis of the facility's spatial capacity and the operational patterns of similar facilities, this building is projected to create approximately 150 direct jobs for artisans and support staff, host around 50 annual activities or events, and attract approximately 30,000 visitors per year, the majority of whom come from the educational and creative tourism segments. These data indicate that the design focuses not only on providing physical space but also on the measurable economic and social impacts for the people of Bojonegoro.

The overall research findings indicate that the transformation of the oil and gas tower metaphor can be implemented comprehensively, from the identification of elements and conceptual transformation to a well-defined spatial program. The resulting "Industrial Creative Tower" concept addresses the need for a city landmark that reflects local identity while supporting the development of Bojonegoro's creative economy.

DISCUSSION

The research findings indicate that the metaphorical transformation of oil and gas towers can be consistently applied at three levels: the form level, the structural level, and the value level. At the form level, the silhouette of traditional towers is reinterpreted as modern landmark towers without losing their vertical and mechanical character. At the structural level, the cross braced framework of wooden towers is adapted into a facade motif that functions as a shading device. At the level of value, the spirit of productivity and mutual cooperation among traditional miners is translated into a program of collaborative spaces for artisans practicing five leading craft disciplines. Consistency across these three levels reinforces the argument that a combined metaphorical approach can produce designs that are not only aesthetically pleasing but also contextually meaningful.

These findings align with the framework of combined metaphors proposed by Antoniades (1990), which asserts that the power of architectural metaphors lies precisely in their ability to combine visual and value based references simultaneously, rather than in mere visual resemblance. These results also reinforce the research by Bakti, Samsudi, and Setyawan (2018) on the design of a sports arena in Kebumen, which demonstrated that a single source object of a metaphor can be consistently translated across various scales of

architectural elements, ranging from the form of the facade to the users' spatial experience. Meanwhile, the success of this design in integrating the functions of a landmark and the creative economy reinforces the findings of Pefrina and Nuryanti (2023) that the metaphorical architectural approach is effective for creating a creative hub that also serves as an iconic landmark for the area. From the perspective of city image theory, the results of this study are also relevant to Lynch's (1960) principles of landmarks, particularly the principles of singularity of form and contrast, as the 20–25 meter tall landmark tower is designed to appear dominant among the surrounding, lower rise buildings. The connection to Howkins' (2001) theory of the creative economy is also evident in the provision of collaborative spaces and digital laboratories, which underscores that the value of the creative economy stems not only from physical craft products but also from the processes of innovation and knowledge management within them.

This study has several limitations. First, data on the dimensions and characteristics of traditional oil and gas towers in Wonocolo are still based on the researcher's visual observations without independently verified technical measurements; therefore, the dimensions used in the design transformation are estimates. Second, the determination of floor area and room capacity is still based on general standards for craft workshop design (Neufert, 1996) and precedent studies; it has not yet been based on a direct needs assessment of all artisans in the five leading craft centers, so there is a possibility that the spatial program will need to be adjusted in further development stages. Third, this study stops at the conceptual design formulation stage and has not yet gone through the prototype testing, structural simulation, or thermal comfort simulation stages; therefore, the detailed technical feasibility of the building requires further study by civil and mechanical electrical engineering disciplines.

Theoretically, this study enriches the field of metaphorical architecture by demonstrating how extractive industry infrastructure can be transformed into visitor friendly public facilities without losing its historical roots. In practice, the Industrial Creative Tower concept can serve as an initial reference for local governments and architectural practitioners in formulating development plans for integrated creative economy facilities in Bojonegoro, while also supporting the regional development strategy that positions the creative economy as one of the priority sectors in the Bojonegoro Regency Medium-Term Regional Development Plan for 2025–2029 (Bojonegoro Regency Government, 2025). For future research, this concept can be further developed through participatory studies with local artisans as well as technical testing of the structural system for the proposed landmark tower.

CONCLUSION

This study concludes that the metaphor of Bojonegoro's traditional oil and gas towers can be consistently transformed into a creative economy facility design through a combined metaphor approach, which integrates the towers' concrete visual elements and abstract values. This transformation yields the concept of the Industrial Creative Tower, which serves a dual function: as a visual landmark that reinforces the image of Bojonegoro

City and as a productive facility that accommodates production, training, and marketing activities for the region's five leading crafts. This concept is expected to serve as a starting point for the development of a more integrated creative economy space in Bojonegoro in the future.

REFERENCES

- Antoniades, A. C. (1990). *Poetics of architecture: Theory of design*. Van Nostrand Reinhold.
- Ashadi. (2019). *Konsep metafora dalam arsitektur*. UMJ Press.
- Bakti, P. N., Samsudi, & Setyawan, H. (2018). Penerapan konsep metafora pada gelanggang olahraga di Kebumen. *Jurnal Senthong*, 1(2), 233–242.
<https://jurnal.ft.uns.ac.id/index.php/senthong/article/view/759>
- Groat, L. N., & Wang, D. (2013). *Architectural research methods* (2nd ed.). John Wiley & Sons.
- Howkins, J. (2001). *The creative economy: How people make money from ideas*. Penguin Books.
- Lynch, K. (1960). *The image of the city*. MIT Press.
- Neufert, E. (1996). *Data arsitek jilid 1* (S. Tjahjadi, Penerj.). Erlangga.
- Pefrina, T. T., & Nuryanti, W. (2023). *Perancangan pusat ruang kreatif dengan pendekatan arsitektur metafora di Yogyakarta* [Skripsi, Universitas Gadjah Mada]. UGM Repository. <https://etd.repository.ugm.ac.id/penelitian/detail/230669>
- Pemerintah Kabupaten Bojonegoro. (2021). *Peraturan Daerah Kabupaten Bojonegoro Nomor 5 Tahun 2021 tentang Rencana Tata Ruang Wilayah Kabupaten Bojonegoro Tahun 2021–2041*.
[https://jdih.bojonegorokab.go.id/upload/196/Perda No 5 tahun 2021 Ttg RTR W tahun 2021 2041 000.pdf](https://jdih.bojonegorokab.go.id/upload/196/Perda%20No%205%20tahun%202021%20Ttg%20RTR%20W%20tahun%202021%202041%20000.pdf)
- Pemerintah Kabupaten Bojonegoro. (2025a). *Peraturan Daerah Kabupaten Bojonegoro Nomor 11 Tahun 2025 tentang Rencana Pembangunan Jangka Menengah Daerah Kabupaten Bojonegoro Tahun 2025–2029*. JDIH Kabupaten Bojonegoro.
<https://jdih.bojonegorokab.go.id/>
- Pemerintah Kabupaten Bojonegoro. (2025b, Agustus 12). *Tembus pasar luar negeri: Hasta karya kayu jati Bojonegoro menjadi inovasi dan inspirasi*.
<https://baghumas.bojonegorokab.go.id/berita/baca/600>
- Radar Bojonegoro–Jawa Pos. (2025, Juni 24). *20 motif, sejuta makna: Batik Bojonegoro menjadi simbol budaya dan ekonomi*.
<https://radarbojonegoro.jawapos.com/lembar-budaya/716183544/20-motif-sejuta-makna-batik-bojonegoro-menjadi-simbol-budaya-dan-ekonomi>
- Sudarmojo, S. A. (2017, Agustus 22). *Bekraf tetapkan lima produk unggulan Bojonegoro*. ANTARA News Jawa Timur. <https://jatim.antaranews.com/berita/203926/bekraf-tetapkan-lima-produk-unggulan-bojonegoro>
- Tempo.co. (2018, April 14). *Nilai ekspor kerajinan kayu Bojonegoro tahun lalu Rp 216 miliar*.
<https://www.tempo.co/ekonomi/nilai-ekspor-kerajinan-kayu-bojonegoro-tahun-lalu-rp-216-miliar-942291>