



Figure 1. Entry hall of the Formosa Plastics Group Museum in Taoyuan, December 2020.

Visualizing Taiwan's Formosa Plastics

Insights

- Taiwan's Formosa Plastics has a damning record of explosions, pollution, and intimidation of its critics.
- Understanding the world of Formosa Plastics requires looking at both civic and corporate knowledge production.
- Visualizing the company involves a political struggle and competing representations.

Formosa Plastics Group (FPG) is one of the largest petrochemical conglomerates in the world, with facilities in Taiwan, China, Vietnam, and the United States. Formosa has a damning record of explosions, routine pollution, and “mafia-like” behavior with environmental activists and other critics [1]. In this article, I reflect on a series of visuals drawn from fieldwork in central Taiwan, as well as from the Formosa Plastics Global Archive (<https://disaster-sts-network.org/content/formosa-plastics-archive>), a collaborative research project supporting and studying data collection in fenceline communities affected by

Formosa Plastics. I focus on both civic and corporate knowledge production about Formosa Plastics, making visible both the company's political power and activists' attempts to address environmental injustice. Visualizing Taiwan's Formosa Plastics, I've learned, involves a political struggle and competing representations.

One place to begin learning about Formosa Plastics is the company's official museum in Taoyuan, a short train ride outside of Taipei. In January 2021, I visited the museum with a team of colleagues. The museum is located on the grounds of Chang Gung University, which grew out of a hospital established



Figure 2. The Goat House in Taixi, Changhua County, December 2020.

by Formosa in 1976 “to make a meaningful contribution to Taiwan’s society” (see <https://www.cgu.edu.tw/p/404-1000-17343.php>). Across six floors, exhibits celebrate the founders and spirit of the Formosa Plastics Group, complete with dioramas, wax figures, and a miniature replica of Formosa’s Sixth Naphtha Cracker Plant.

The museum’s centerpiece is a large piece of kauri wood from New Zealand (Figure 1). Formosa founder and chairman Wang Yung-Ching acquired the burl—a knotty outgrowth in a tree usually caused by bacteria—in 2002 after seeing it at an exhibition in the industrial port city of Kaohsiung. For Wang, the piece of kauri wood symbolized the “immeasurable capabilities and longevity of the Formosa Plastics Group.” As my colleagues and I shared notes and impressions from our visit, we realized that *burl* also translates as “tumor” in Mandarin (瘤).

For residents of Taixi, a small village north of Formosa’s Sixth Naphtha Cracker Plant (臺塑六輕石化廠), *burl* as

tumor is more than just a metaphor. During a fieldwork visit in December 2020, I became curious about a desolate three-story building (Figure 2). A resident told me that Formosa built the structure to provide apartments for its employees. Not a single worker ever moved in, likely well aware of the health implications of living next to the petrochemical complex. Known locally as the Goat House, the half-finished building is used for livestock and storage.

Looking out from the blighted balcony, we could see the smokestacks of the petrochemical complex on the distant horizon, as well as two mobile air-pollution monitors set up by the Taiwanese Environmental Protection Administration (EPA). In 2012, atmospheric scientist Tsuang Ben-jei carried out a study in Taixi, linking Formosa’s emissions to elevated cancer levels in the village. After Tsuang talked about his preliminary findings to a journalist, Formosa filed a libel lawsuit, which the company eventually lost. Despite Formosa’s attempted

retaliation, health researchers continue to point out the elevated rates of cancer [2] and kidney disease [3] in Taixi.

Taixi residents have used creative visualization and archiving to push back against Formosa Plastics. In 2013, local artists Chung Sheng-hsiung and Hsu Cheng-tang published the catalog *When the South Wind Blows*. Through gritty black-and-white photos, short poems, and landscape shots of the petrochemical zone, the book depicts life in the village. Pictures of villagers holding up portraits of family members they have lost to cancer and other lung diseases caused by Formosa’s pollution are particularly haunting. Working with curators at the Tainan Natural History Museum, Chung and Hsu organized a public exhibition of the same title (<http://southwind.nmns.edu.tw/Exhibits/103/southwind/index.html>), using the photographs to re-create an experience of the village for urban museum visitors [4]. During an interview with Hsu and his family, I was especially moved when his mother produced a worn copy of the exhibition catalog, with pages covered in signatures, including that of Taiwan’s former president Ma Ying-jeou.

Aware of the emotional and political import of the artwork, Hsu Cheng-Tang and his sister Hsu Liyayi set up the Taixi Photo Gallery (台西村影像館; Figure 3; <https://bit.ly/34pgzNu>). The

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Figure 3. Photo gallery in Taixi, December 2020.

gallery is located in a small farm building next to their home; the renovation was partly subsidized by the Changhua County Cultural Affairs Bureau. The opening event in 2018, attended by health researchers from Taipei, was an occasion to discuss future actions for the village, such as building a solar energy “citizen power plant” [5]. When Hsu Liyayi took us through the gallery, a new set of black-and-white photos was on display. One striking series, taken before Formosa’s arrival in 1991, showed villagers joyfully performing worship rituals at the nearby Zhuoshui River, (see [6]). Those photos were contrasted with contemporary landscape photos that documented how diversion of the water to Formosa’s naphtha cracker has turned the riverbank into Taiwan’s largest desert [7]. Hsu Liyayi says that outsiders, especially students and environmental groups, frequently visit the gallery to learn about the intense ecological changes the region is facing.

Reporters for the environmental public TV series *Our Island* provide yet another angle on life in Taixi and other towns around the Sixth Naphtha Cracker Complex. Figure 4 is a shot of the complex from the personal archive of documentary director Ke Chin-yuan, who has followed Formosa Plastics since the 1980s (a form of journalism Paul Jobin considers exemplary of Taiwanese “civic eco-nationalism” [8]). With its monochrome blue tint, the image gives

the impression that the entire area is covered in a smoky haze.

The photo also captures a row of fishing boats floating right outside the complex. In the 2019 episode “6th Naphtha: Petrochemical Kingdom of the Sea” (https://www.youtube.com/watch?v=cg4lgyEdY8g&feature=emb_title), Ke and his team document how oyster farmers have long resisted Formosa because of the effects of pollution on the area’s rich marine life. Early land reclamation for the industrial zone—comparable in landmass to the Chinese city of Macao—led to mud interrupting the oyster breeding process. Today, evidence of air pollution can be seen not only in the darkened

faces of oyster farmers returning from sea but also in the significantly diminished growth of oysters and clams.

In addition to air pollutants, Formosa continuously releases plastic waste into nearby waterways, a less widely known form of pollution. During our first field trip to Mailiao, we followed the advice of zero-plastics activists Xavier Sun (<https://www.no-burn.org/taiwan-soon-to-be-plastic-free/>) and visited the water outfalls outside the petrochemical zone, where we collected small plastic pellets (also called *nurdles*; see Figure 5). These pellets are a recognized form of marine debris, known for releasing plastic



Figure 4. Sixth Naphtha Cracker Complex, January 2003.

additives into water. They also absorb hydrophobic pollutants such as mercury. There is currently no regulation of pellet pollution in Taiwan.

Nurdle pollution emphasizes the transnational scope of Formosa's pollution. Over the past five years, a group of environmental activists in the small town of Point Comfort, Texas, have been monitoring waterways near the local Formosa Plastics plant. Led by fourth-generation fisherwoman Diane Wilson, the group launched a lawsuit, eventually achieving a landmark \$50 million settlement, an increase in monitoring capacity and a zero-discharge agreement with Formosa. A few months after the settlement, however, activists documented that Formosa Texas—as in Yunlin County—continued to release pellets [9]. Wilson and her fellow activists continue to donate collected pellets to Nurdle Patrol (<https://nurdlepatrol.org/Forms/Home/>), a citizen science project at the University of Texas at Austin that maps plastic pollution on the Gulf Coast and elsewhere.

Following a series of accidents and explosions at the Sixth Naphtha Cracker Complex in 2010, Formosa increased its investment in the local community and presence as a “good neighbor” [10]. The snapshot of the security car is one of many examples of infrastructure that the company is providing to the Mailiao township (Figure 6). Formosa also provides waste management trucks and has built school buildings, gyms, and the local county office. It publishes the quarterly newspaper *Qin Qin Bao* (<https://bit.ly/3vGyB9W>), which citizen journalists have accused of denying the extent of air pollution. In his 2018 documentary *Kisses and Hugs* (<https://bit.ly/3uGhZ0W>), Taiwanese filmmaker Chan Hao-chung uses the Formosa newspaper as a lens into the relationship between the community and the petrochemical industry, focusing on multiple relocations of the Ciaotou Elementary School Syucuo Branch, located in direct proximity to the Sixth Naphtha Cracker Complex.

News coverage of air pollution is at the center of the courtroom sketch shown in Figure 7. It was drawn by sociologist Paul Jobin during the proceedings of a toxic tort suit started by fenceline community residents in Yunlin (see also [10]). On the day of a court hearing in January 2017, Formosa



Figure 5. Plastic pellets (nurdles) outside the Sixth Naphtha Cracker Complex, Mailiao, Yunlin County, October 2020.



Figure 6. Security car in Mailiao, Yunlin County, with signage that the fleet is sponsored by Formosa Plastics, October 2020.

Plastics made headlines for having falsified air pollution data. The ruling judge, however, dismissed the plaintiff lawyers' attempt to bring up the front-page news (“I don't care about newspapers!”). This sketch and others (<https://bit.ly/2TeWlUc>) between 2017 and 2021 powerfully recall the dynamics of the legal case and are also inspiring collaboration between academic researchers and communities affected by pollution.

A different yet similarly creative use of visuals can be seen in southern Louisiana, in the petrochemical corridor known as Cancer Alley. A coalition of environmental justice

activists, led by the faith-based group Rise St. James, is challenging the opening of a new, multibillion-dollar Formosa Plastics complex [11]. In June 2020, the coalition achieved an indefinite delay of the plant's construction, calling for a reevaluation of the sacred slave burial grounds located on the site. The data used by the activists included independent archaeological examinations (<https://bit.ly/3v2KkPc>), which had been initiated by Formosa, and aerial photographs. The photos, like the courtroom sketches, demonstrate how diverse data collection relevant to environmental activism can be. They

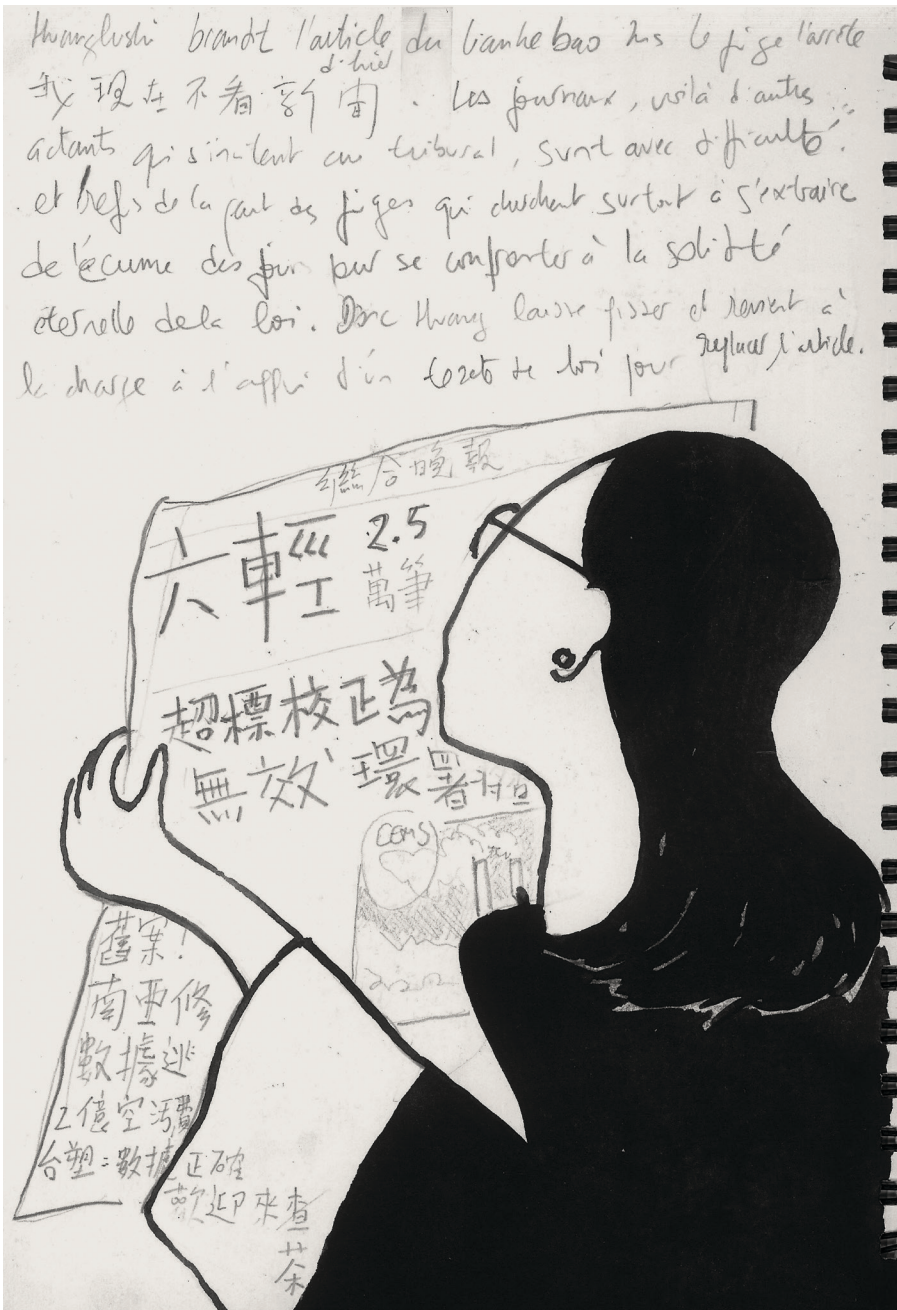


Figure 7. Courtroom sketch by Paul Jobin, January 13, 2017.

also demonstrate how environmental visualizations are always caught up in contests over how industry and environmental problems should be represented.

The Formosa Plastics Global Archive, and civic data infrastructure more broadly, needs to have a place for the diverse material described here—visualizations and data that may not have generalizable importance but are critical at the local level. And civic data infrastructure needs to have global reach. Cancer Alley is not far from Point Comfort—both are on the Gulf Coast

and about 500 miles apart—but forging connections between the two sites continues to be difficult. Activists in the U.S. are also working to establish and maintain close relations with advocates in Taiwan. Civic data infrastructure should be designed to help with this. Thus, this infrastructure, and our analysis of visualizations, needs to be both locally tuned and global in scope.

ENDNOTES

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