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Petrochemicals, Pollution, and the Moral Economy of Noxious Industry: Grangemouth, Scotland, from 1951 to 1989

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In 1989, British Petroleum (BP) made the largest onshore investment in the company's 72-year history in Scotland by expanding its Grangemouth petrochemical complex. Construction and operation were promised to generate between 1,200 and 1,500 jobs, but upon the project's completion, over 1,000 industrial jobs were lost in the town, and employment never increased. This research explains this outcome by embedding it within a history of post-World War II deindustrialization and engaging with E.P. Thompson's moral economy and the concept of "noxious deindustrialization": expanding environmentally destructive capacity and shrinking industrial employment. It illuminates what the buildup and later transgression of moral economy promises looked like for a town experiencing rapid but fragile expansion on the back of petrochemicals, a modern, highly toxic, and land-intensive industry. Using oral history and archive study, the research establishes the presence of noxiousness in Grangemouth from the mid-twentieth century onward. Between 1951 and 1970, industrialization, urban expansion, and paternalistic corporate practices shaped customary notions that embedded the petrochemical sector into the community, justifying concerns about pollution, smells, and the industry's intensive requirements on land. Between 1970 and 1989, the moral economy was transgressed as the planning system was dismantled and BP's welfarist responsibility to Grangemouth lessened under economic liberalization. Amid growing environmental concerns globally, noxiousness became intolerable. Noxious deindustrialization accelerated with changes in energy prices, consolidation of private power, and discovery of North Sea oil, leading to company restructuring and job cuts in BP Chemicals. Consequently, the link between employment, population growth, and economic security broke down.

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Introduction

In November 1989, the front page of *The Glasgow Herald* announced BP Chemicals' (a division of British Petroleum) investment of £250 million into its Grangemouth petrochemical complex, the most expensive onshore investment in the company's 72-year history in Scotland.¹ British Petroleum (BP) planned to expand Grangemouth's existing ethylene manufacturing capacity from 270,000 tons to 600,000 tons per annum and predicted that between 1,200 and 1,500 jobs would be generated in the construction phase alone.² Grangemouth, a petrochemical and oil refining town in the central belt of Scotland between Glasgow and Edinburgh, experienced prosperity and growth following World War II, with BP Chemicals operating as the major player in the town's economy. By 1970, however, Grangemouth was beginning to experience economic insecurity, with jobless growth contravening expectations of employment expansion cultivated by investment in the 1950s. In the context of employment contraction—and industrial closures in the 1980s across Scotland more widely—the promise of over 1,200 jobs was welcomed. Frank McKeever, then convenor of the Transport and General Workers' Union (TGWU) at BP Chemicals, described the investment as “the best news staff there had received in 15 years,” a reference to the disappointment of stagnating employment at the plant since the early 1970s.³ Spirits were revived, and in 1993, the new plant was opened by Princess Anne.⁴ The investment, however, failed to boost local employment. Over 1,000 industrial jobs were lost between 1991 and 1992 across the town, and employment rates never increased beyond the 1989 prior level.⁵

The petrochemical industry is characterized by its high capital intensity and correspondingly low labor costs.⁶ Moreover, petrochemical production induces health damage and environmental degradation, captured in the concept of “noxiousness.”⁷ Amid deindustrializing Scotland, these aspects were accentuated, and by 1989, BP Chemicals in Grangemouth was experiencing not only job losses but also health and safety issues and vocal disputes against its polluting operations. To explain the outcome of a noxious jobless investment, this article examines BP Chemicals in Grangemouth from 1951 to 1989 within the wider historical context of deindustrialization in Scotland after World War II. Two hitherto parallel concepts deployed in the analysis of deindustrialization are synthesized, noxiousness and the moral economy, with both enriched in the process through an extended historical survey.

1. *The Glasgow Herald*, “£560 Million Flows into Oil,” November 17, 1989, 1.

2. *Ibid.*

3. *Ibid.*

4. *The Herald*, “Welcoming a #300m giant. Chemical plant puts Scotland on world map.” June 25, 1993.

5. House of Commons, “Debates for 13 May 1992.”

6. Hanieh, “Petrochemical empire,” 44.

7. Feltrin and Sacchetto, “Work-Technology Nexus,” 816.

“Noxiousness deindustrialization” was coined originally by Feltrin et al. in relation to Grangemouth in the 2020s, describing the state of continued noxious industrial production and shrinking industrial employment.⁸ The 1989 case is taken as an early example of noxious deindustrialization, with the article tracing its roots back to noxious industrialization of the 1950s and 1960s. Historians of deindustrializing Scotland have identified a “moral economy” whereby the operation of labor markets was negotiated by customs and expectations of just employment practices held by the workforce.⁹ This is extended through integration with noxiousness to reveal the moral economy logic through which residents, workers, and local administrative officials mediated perspectives on noxiousness, as well as the role played by corporations and government in shaping these attitudes. While the trade-off between environmental harms and economic goods had existed for decades, as benefits from industry were stripped, residents and communities became more aggrieved by its presence.

This study draws on archive material sourced from the Scottish Office of the UK government, concentrating on the Development Department, Industry Department, and Scottish Economic Planning Board files pertaining to regional industrial policy and location of industrial sites and growth areas as well as North Sea oil extraction. Treasury, Board of Trade, Department of Energy, and Prime Minister’s Office records from the UK government reveal further correspondence on unemployment in Scotland, North Sea oil, relations between the government and BP, and designation of industrial development grants. Census records show population and sectoral employment changes between 1951 and 1991, while parliamentary documents from the years 1962 to 1982, sourced online via the House of Commons *Hansard* archives, illuminate how Grangemouth and Falkirk members of parliament (MPs) discussed their constituents’ issues and grievances, thus situating these issues in a national setting. Local perspectives and community attitudes toward industrial change are revealed in Grangemouth local plans, Falkirk regional surveys, and public participation reports, as well as the local newspapers, *The Falkirk Herald* and *The Grangemouth Advertiser and Eastern District Chronicle*. Drawing on local and national sources, the research embraces a local reading of Grangemouth rather than one defined by the administrative elites of Edinburgh and Whitehall, showing that the story of Grangemouth is not only one of power and economy but also about the geographical realities of industrial transformation and environmental degradation.

Archive documents are integrated with oral history findings. Nine semistructured interviews were conducted from February to June 2023 with former workers from four major petrochemical and oil firms in Grangemouth (BP Chemicals, BP refinery, Imperial Chemical Industries [ICI], and Borg-Warner Chemicals), as well as residents with family members who worked in oil and petrochemicals. Four of these interviews were selected for analysis for this paper—all current residents who grew up in Grangemouth or the surrounding area, and three of whom had worked for chemical firms in the town. The range of participants reached contributes to an understanding of how national changes were perceived within the

8. Feltrin et al., “Noxious Deindustrialization,” 960-961.

9. Gibbs, “Managing deindustrialization,”; Perchard and Phillips, “Transgressing the Moral Economy,”; Phillips et al., “Deindustrialization.”

community, as well as the scope and reach of the development of the petrochemical industry in shaping the community's public memory.¹⁰

In examining the particular case of BP Chemicals' investment package in 1989 and consequent job losses, this research explains popular attitudes to economic and industrial changes throughout the post-World War II period, showing how noxious buildup and contraction were experienced by the Grangemouth petrochemicals workforce and community. The paper is divided into three parts. The first explains the synthesized concept, the moral economy of noxiousness. The second shows how employment growth in the 1950s and 1960s made noxiousness tolerable and legitimate, and how this expansion contained seeds of future jobless growth. The third examines how noxiousness became less tolerable in the 1970s and 1980s owing to the jobless nature of continued growth, amid emergent environmental and health and safety concerns.

The Moral Economy of Noxiousness

Grangemouth sits within the historical context of employment deindustrialization in Scotland after World War II, identified by historians as a long-term process of employment contraction.¹¹ After the war, policymakers sought to shift Scotland's industrial base away from reliance on "heavy" industries like coal mining, steelmaking, and shipbuilding. Multinational operators were drawn in via regional policy, absorbing former heavy industry workers into car manufacturing, electronics, and engineering.¹² Historians have characterized the managed contraction of heavy industry as the "moral economy" of deindustrialization. The moral economy was originally theorized by E.P. Thompson, who examined how English plebian consumers between the sixteenth and eighteenth centuries engaged in riots to enforce traditional practices of selling bread at a "fair" price rather than a profit-driven market price.¹³ Karl Polanyi's critique of industrial capitalism dovetails with this framing. Polanyi's theory pointed to the increasing abstraction of the economy from social life, with social reform and labor "counter-movements" arising throughout the nineteenth and twentieth centuries fighting against the commodification of resources to "re-embed" the market within society.¹⁴

The post-war economic restructuring was shaped by working-class people across industrial Scotland defending a "moral order" based on learned and inherited conceptions of justice.¹⁵ Following mass unemployment in the 1930s, the post-World War II period witnessed "'counter-movement' coalitions" of worker representatives and policymakers safeguarding against liberalizing pressures of the market, improving employment and working conditions with economic protections that re-embedded economic activity into society.¹⁶

10. Abrams, *Oral History Theory*, 88.

11. Tomlinson, "De-Industrialization Not Decline," 86-88.

12. Phillips et al., *Deindustrialisation and the Moral Economy*, 83-94; Phillips et al., "Deindustrialization," 402; Turok, "Inward Investment," 410-413.

13. Thompson, "The Moral Economy," 78-79; Thompson, *Making of the English Working Class*, 67-72.

14. Polanyi, *The Great Transformation*, 24.

15. Gibbs, "Managing deindustrialization," 127-129.

16. Phillips et al., *Deindustrialisation and the Moral Economy*, 47-48.

Gibbs identifies how colliery closures across Scotland between the 1950s and early 1980s were largely conceived of as “just” because of community control of resources and dialogue between managers and unions that ensured economic protections through the industrial transition.¹⁷ As Gibbs emphasizes, along with Perchard and Phillips, grievances arose when the moral economy collapsed and expectations and promises were transgressed.¹⁸ Under economic liberalization and aggressive antitrade union policies pursued by the Conservative government elected in 1979, deindustrialization accelerated rapidly.¹⁹ The moral economy of post-war deindustrializing Scotland was thus a dynamic, iterative process and the consequence of interactions between policymakers, citizens, employers, and workers.

The moral economy of deindustrialization as a concept is enriched when applied to the case of Grangemouth, interrogating the town’s connections to highly carbonized economic activity. Petrochemicals was a modern industry that replaced coal-based chemicals in the energy transition to a petroleum-based economy. Despite this, the area has remained largely under-researched in a Scottish context despite sitting within the same story of industrial transformation, employing workers shed from the shale oil industry and coal mines.²⁰ Industrial modernization policies that grew the town and industry contributed to expectations of just employment practices. The industry, however, was highly polluting in its expansion and contraction, with toxicity informing moral economy grievances that arose from the 1970s when the government and BP began divesting from petrochemicals and Grangemouth.

Pollution and toxicity from the petrochemical industry are framed through the concept of “noxiousness,” utilized by Feltrin and Sacchetto in relation to a workerist group—industrial working class political groups organizing in Italy during the 1960s and 1970s—in the petrochemical complex of Porto Marghera, Venice.²¹ This group articulated a labor struggle against “*nocività*” or “noxiousness” inherent in industrial capitalist labor processes, encompassing socio-environmental issues such as pollution, accidents, physical hazards, rising social inequality, and workplace precarity.²² Noxiousness draws from environmental justice studies. Awareness and intolerance of the noxious violence of the petrochemical industry grew amid an emergent environmental movement throughout the 1960s. Following the publication of Rachel Carson’s *Silent Spring* in 1962, international attention was drawn to the toxic impact of synthetic chemicals on ecological systems, with social awareness intensifying in the face of visible environmental disasters caused by the petroleum industry throughout the 1960s and 1970s.²³ Water and soil were contaminated by industrial activity, and bodies, too, were “worn out and discarded, mangled, poisoned, and diseased in the workplace to varying degrees.”²⁴

17. Gibbs, “Managing deindustrialization,” 138–139.

18. Perchard and Phillips, “Transgressing the Moral Economy,” 389; Gibbs, *Coal Country*, 85.

19. Phillips et al., *Deindustrialisation and the Moral Economy*, 109–111.

20. Stokes, *Opting for Oil*, 3; Marriot and Macallister, *Crude Britannia*, 56–57.

21. Feltrin and Sacchetto, “Work-Technology Nexus,” 816–817.

22. *Ibid.*, 816.

23. Jones, *Profits and Sustainability*, 86–87; Markowitz and Rosner, *Deceit and Denial*, 165; Bergquist, “Business and Sustainability,” in *Routledge Companion*, ed. Lopes et al., 552.

24. McIvor, “Deindustrialization Embodied,” in *The Deindustrialized World*, ed. High et al., 32.

“Noxious employment deindustrialization”—“noxious deindustrialization” for short—extends the framing of noxiousness and integrates it with deindustrialization studies.²⁵ Feltrin et al. apply the concept as a sociological category of analysis to explain socio-environmental harms through the continued operation of noxious industry, coupled with shrinkage of industrial employment.²⁶ The authors take Grangemouth in the 2020s as an extreme, localized example of the phenomenon, and frame their analysis around the “social contract.” Pollution and noxiousness were largely tolerated if the industry provided economic security for the community, with the industry’s presence becoming contentious as employment shed and noxiousness accumulated. The framework utilized by this paper, the moral economy of noxiousness, advances scholarship on noxious deindustrialization by articulating “noxiousness” as a historical category of analysis and uncovering the precise timeline that brought noxious deindustrialization into existence. The article traces historical dimensions of noxiousness pertaining to not only pollution and socioenvironmental harms but also its dimensions as related to the petrochemical industry’s capital- and land-intensity locking in an unsustainable development path. Rooted in the expansion of the petrochemical industry and worsening through deindustrialization, noxiousness thus helps to explain attitudes in the 1950s as well as the 2020s.

The social contract and its relationship to noxiousness is representative of a broader trend in industrial towns across developed economies in the late twentieth century. As social awareness and understanding of noxiousness grew from the 1960s onward, industrialization, through the promise of employment and economic opportunity, “triggered mechanisms of societal acceptance of risky industries,” Pasetto and Iavarone write about the petrochemical industry in Gela, Italy.²⁷ Companies created “conditions of tolerable moral comfort” allowing communities to overlook existing environmental dangers in industrial expansion like pollution, toxic gases, or radioactivity.²⁸ But toxic industry held toxic legacies, and as the industry contracted the breakdown of the social contract meant that industrial disease claims and environmental concerns intensified: “systemic economic violence left a lasting legacy long after the work had disappeared,” writes McIvor.²⁹ Anthropologists have revealed what these legacies look like today through ethnographic study of industrial towns. In Grangemouth in the 2000s, Schlüter et al. identified stark dissatisfaction with the petrochemical industry after a decade of dramatic job cuts in BP, articulated around the environmental dangers of its operations, as well as the absence of economic security despite an expanding production output.³⁰ Residents also expressed heightened fears around asthma and cancer from breathing in toxic carcinogenic chemicals, despite the existence of airborne fumes for decades.³¹

The moral economy of noxiousness is integrated with literature on corporate environmentalism to emphasize the presence of private power and liberal markets in the growth of

25. Feltrin et al., “Noxious Deindustrialization,” 951-952.

26. *Ibid.*, 951.

27. Pasetto and Iavarone, “Environmental Justice,” in *Toxic Truths*, ed. Mah and Thom, 204.

28. Zonabend, *The Nuclear Peninsula*, 2.

29. McIvor, “Deindustrialization Embodied,” in *The Deindustrialized World*, ed. High et al., 32.

30. Schlüter et al., “Enough Is Enough,” 720-721; Phillimore et al. “Residents, Regulators, and Risk,” 76.

31. Feltrin et al., “Noxious Deindustrialization,” 960-961.

polluting activities and toxicity. As awareness of environmental issues grew, firms in the oil industry began adapting to public environmental requirements.³² BP, for instance, in 2001 rebranded to “Beyond Petroleum,” committing to solar energy and voluntarily reporting on carbon emissions.³³ This response, though, strategic in nature, achieved little meaningful environmental change, and toxic practices in petroleum industries persisted despite apparent adherence to sustainability principles.³⁴ Through the case of BP’s Deepwater Horizon rig where an explosion caused the death of eleven workers in 2010, Schwartz argues that the structural root of BP’s environmental disasters lay in profit maximization. Toxic forms of capital-intensive production became more dangerous as safety measures were repeatedly breached in the name of cost-cutting, overriding “ethical values” such as responsibility, citizenship, and trustworthiness.³⁵ BP’s ethical values, or what this article conceptualizes as moral economy obligations, were reneged since the 1980s, following the oil crisis that saw the company downsize, shed jobs, and cut back the capacity of its refining and petrochemical plants. The sale of the company’s public shares further consolidated this trend. Rome recognizes deference to private shareholders as an obstacle to adopting sustainable practices through the case of DuPont, a US chemical giant, whose attempts to “green” itself in the 1980s and 1990s were curtailed by liberal market pressures.³⁶

This body of literature aligns with the concept of “petrocultures,” which reveals the social, economic, and political relevance of oil and demonstrates how petroleum has become enmeshed with society.³⁷ Along with corporate environmentalism, this perspective on oil dependency helps show how despite the growth of climate concern in the 1980s, oil-based production remained highly pervasive in Grangemouth.³⁸ Buelens demonstrates through analysis of petrocultures how in The Netherlands, throughout the twentieth century, Royal Dutch Shell wielded economic and cultural power to build an image of a trusted and modern company, allowing it to integrate into Dutch political life, and more easily deflect public scrutiny around environmental malpractice.³⁹ BP’s own economic and political capital shaped the moral economy of noxiousness as it allowed the company to integrate into the Grangemouth locality, making it difficult to shift away from oil after the 1970s when it became clear that the infrastructure was maligning the town. Schlüter et al.’s analysis reveals that despite vocal expressions of dismay and disappointment, overt environmental campaigns against the industry, particularly against BP, were few and far between.⁴⁰ In single-industry towns like Grangemouth with the oil and chemical industry tightly woven into the social and economic fabric of the locality for generations, residents felt that critique of environmental performance risked harming these ties.⁴¹ Campaigns that did exist were characterized

32. Hoffman and Bansal, “Retrospective,” in *Oxford Handbook*, ed. Bansal and Hoffman, 6-7.

33. Schwartz, “Beyond petroleum,” 73-74; Boon, “A climate of change?,” 124.

34. Mah, *Plastics Unlimited*, 37.

35. Schwartz, “Beyond petroleum,” 85.

36. Rome, “DuPont,” 99.

37. Åberg et al., “Pervasive petrocultures,” 6.

38. Wilson et al., “On petrocultures,” in *Oil, Politics, and Culture*, ed. Wilson et al., 9-10.

39. Beulens, “Royal Dutch Shell,” 3.

40. Schlüter et al., “Enough Is Enough,” 720-721; Phillimore et al. “Residents, Regulators, and Risk,” 76.

41. Schlüter et al., “Enough Is Enough,” 716.

primarily by ad hoc organizations from the 1990s against planning applications for chemical-based industrial activity like chemical storage and waste incineration. These campaigns, the authors argued, had “virtually no reference to wider environmentalist networks.”⁴² Interrogation of historical records enhances perspectives on environmentalism by showing awareness of noxiousness—and expressions of dissatisfaction toward this noxious industrial structure—early on in industrial development, and moral economy conditions through which this awareness was mediated.

Noxious Industrial Expansion from 1951 to 1970

In the post-World War II transition from coal to oil, Grangemouth was selected by policymakers and industrialists to be the centerpiece of Scotland’s new petroleum economy. In 1951, BP Chemicals commissioned Grangemouth’s first petrochemical plants producing ethylene, the most important and widely produced chemical, and isopropanol.⁴³ These plants were the first of their kind in Europe.⁴⁴ Within this first decade of operations, ethylene manufacturing capacity doubled to 70,000 tons, while production output of all products grew by ten times from 25,000 tons to over 300,000 tons per annum.⁴⁵ BP Chemicals rapidly adapted to new market demand and the Grangemouth site grew quickly, expanding well beyond its ethylene and isopropanol plants to produce a wide range of chemicals involved in the production of plastics and synthetics.⁴⁶ By 1970, the factory’s total production capacity of all chemicals stood at 750,000 tons.⁴⁷

Petrochemicals represented Scotland’s turn away from heavy manufacturing and attendant low productivity rates, and its march toward a modernized, diverse economic structure. Policymakers, observing Grangemouth’s thriving petrochemical operations, recognized the town’s “remarkable capacity for change and expansion.”⁴⁸ To support Grangemouth’s growth, investment and township rights were granted to the Grangemouth Town Council to allow it to attract industry and expand the town. Through the 1957 Housing and Town Development (Scotland) Act, Grangemouth received a grant under the Town Development Scheme for the

42. Ibid., 718.

43. BP Chemicals was formed in 1947 as a joint venture between the Anglo-Iranian Oil Company (which became BP in 1954) and The Distillers’ Company. British Petroleum Chemicals was renamed British Hydrocarbon Chemicals (BHC) in 1956 to avoid confusion with its parent company. In 1967, BHC was renamed BP Chemicals following BP’s acquisition of The Distillers’ Company. This article will refer to the company as BP Chemicals for consistency.

44. BP Society. “Grangemouth at 100.” <https://bpsociety.co.uk/grangemouth-at-100/> (accessed September 24, 2024).

45. Bamberg, *British Petroleum*, 352, 354.

46. Ibid., 353; Between 1951 and 1960 BP Chemicals in Grangemouth expanded to produce butadiene (used in the production of synthetic rubbers and polymers), monomeric styrene (used to produce polystyrene, which also created the byproduct toluene sold for use in solvents, explosives, and nylon), cumene (for acetone), detergent alkylate (the chemical intermediate to produce synthetic detergents), acrylonitrile (polymerised to create acrylic fibres in fabric), and the plastic material high density polyethylene (Grangemouth Town Council, *Industrial Development Handbook*, 41).

47. Dalgleish, *BP in Scotland*, 27.

48. T 224/1027 Draft White Paper for Central Scotland Cmnd 2188, 1963, 5, TNA.

building of 750 houses, a shopping center, a school, and a 60-acre industrial estate. Also facilitated under this Act was the movement of a portion of Glasgow's "overspill" population into Grangemouth's new housing schemes in post-war slum clearance initiatives.⁴⁹ The coordinated mass redistribution of Scotland's labor force was tied to the project of manufacturing modernization, shifting the workforce away from traditional heavy industry and into areas where new modern industrial settlements were developing.⁵⁰ This was exemplified in Grangemouth, which, while not granted full New Town status, was the first settlement in Scotland to receive a Town Development Grant. Six years later, in 1963 the White Paper for Central Scotland was published that built on this program of labor redistribution, identifying "growth areas" across Scotland's central belt.⁵¹ These areas were designed to attract industry through financial incentives and investment into industrial sites, road networks, housing, and transport. Under this strategy, Grangemouth, within the Grangemouth/Falkirk Development District, was named a growth point. Industrial expansion was further accelerated through the 1966 Industry Act under the Labour government, which gave grants toward industrial machinery and plants in Development Areas across Britain.

Through a coordinated government strategy aimed at Grangemouth, petrochemical activity was successfully embedded into the locality, with the expansion of industry bound to the expansion of the town. Between 1951 and 1971 Grangemouth's population swelled by 60 percent from 15,000 to 21,500, while chemical employment in the region of Stirling, which incorporates Grangemouth, grew from 4,367 to 6,000 (peaking at over 7,000 in 1966).⁵² Figures 1, 2, and 3 below show snapshots of the Grangemouth industrial hub in 1950, 1960, and 1980, respectively. With all industrial land visibly owned by BP, the maps show how the sector's expansion progressed in lockstep with the township, with each decade showing an increasingly dense urbanized and industrialized structure. The maps also emphasize the scale and dominance of the petrochemical industry, an early sign of noxiousness. Between 1950 and 1960, BP absorbed a significant amount of land including the Grangemouth airfield, which had been active during World War II until 1955. The company expanded its oil operations on the north side of Bo'ness Road, the main road running through Grangemouth and onto Bo'ness, a neighboring settlement in West Lothian, and constructed its petrochemical site on the south side of the road. Noxious industrial operations became inescapable, brought closer to the daily lives of residents, next to houses, Grangemouth Secondary School, and the town's main park, Zetland Park.

By 1960, residents including BP employees lived as close as a five-minute walk from the oil and petrochemical complex with houses lining Bo'ness Road right up to where the site begins. By 1980, the town's network of housing had expanded further; a new park, Inchyra Park, was constructed, as well as schools and recreational grounds, directly adjacent to BP's chemical works which too had expanded further into the land on the south side of Bo'ness Road. The scale of industrial development is reflected in oral testimonies, which demonstrate awareness

49. T 227/1249 Letter from John McGuinness, Department of Health for Scotland, to the Treasury, 12 February 1959, TNA.

50. Levitt, "New Towns," 228-229.

51. Cmnd 2188.

52. *Census 1951 Scotland, Occupations and Industries*, vol. 4, Table 13, 441; *Census 1951 Scotland*, vol. 1, Table 1, 15; *Sample Census 1966, Economic Activity*, Table 3, 29; *Census 1971 Scotland, County Report*, Table 2, 1.

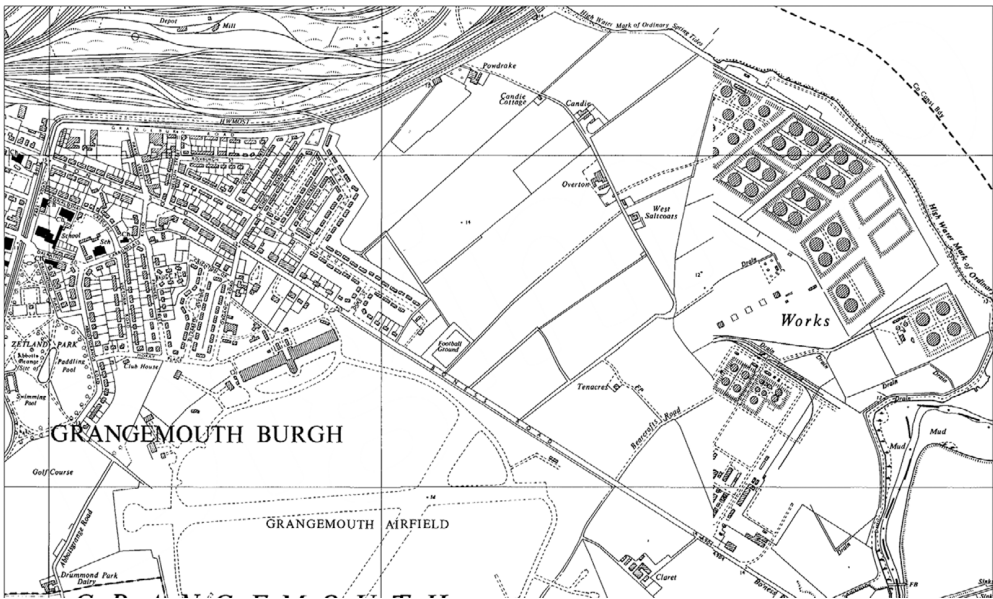


Figure 1. Grangemouth in 1950. Source: Historic Digimap Collection (British National Grid). © Crown Copyright and Landmark Information Group Limited (2024). All rights reserved. 1950.

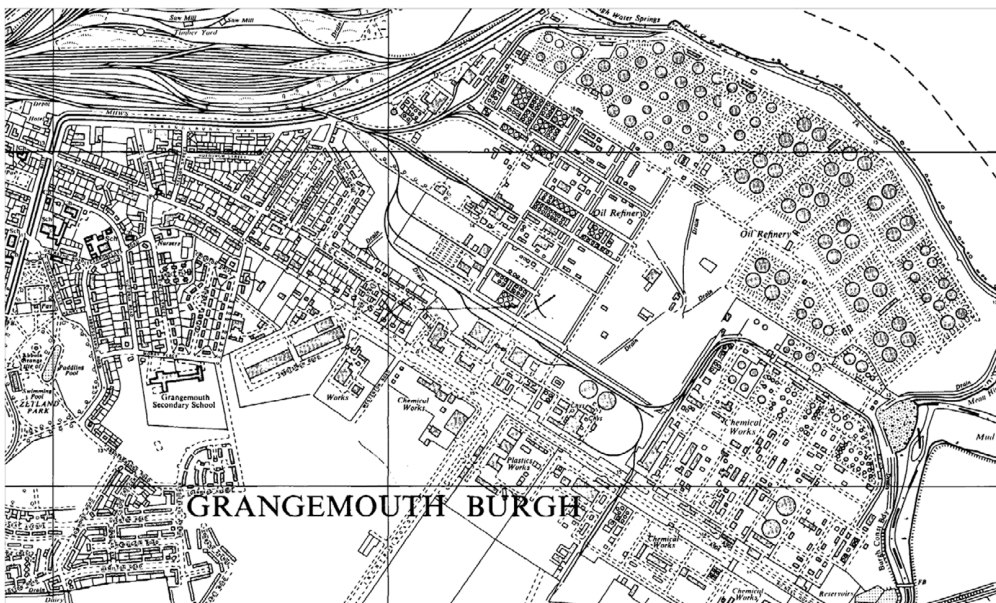


Figure 2. Grangemouth in 1960. Source: Historic Digimap Collection (British National Grid). © Crown Copyright and Landmark Information Group Limited (2024). All rights reserved. 1960.

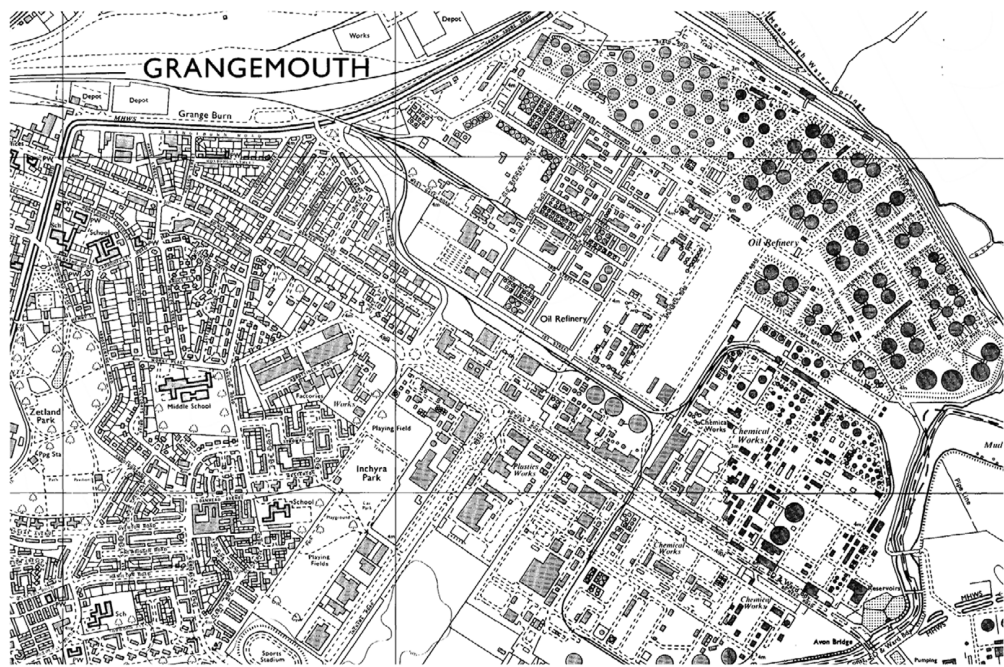


Figure 3. Grangemouth in 1980. Source: Historic Digimap Collection (British National Grid). © Crown Copyright and Landmark Information Group Limited (2024). All rights reserved. 1980.

Table 1. Employment in Stirling across select industries

	1951	1966	1971
Chemicals and Allied Industries	4,367	7,110	6,000
Agriculture	3,460	2,480	2,090
Mining and quarrying	5,971	2,210	1,410

Source: *Census 1951 Occupations and Industries*, Table 13, 440-442; *Sample Census 1966 Economic Activity*, Table 3, 29-31; *Census 1971 Economic Activity*, Table 3, 127-132.

of noxiousness early on in expansion. Industrial activity released strong odors through the emission of toxic airborne substances—a process deemed much worse fifty years ago due to the lack of industrial regulation on chemical substances in the 1960s.⁵³ William Ballantine, from Bo’ness, remembered how growing up in the 1960s, “periodically there would be very odd smells would waft its way [sic] towards Bo’ness [from Grangemouth] and you’d wonder what was going on.”⁵⁴

While embedded in the locality, the tremendous growth of the petrochemical industry and its dominance in Grangemouth contained seeds of future noxious deindustrialization. The town’s industrial and economic structure risked becoming dependent on a single land- and capital-intensive firm, giving little space for industrial diversification. Employment figures in Table 1 demonstrate this trend. While employment in the chemicals industry in the region

53. Harrington, “Occupational health and safety,” 247.

54. William Ballantine, interview.

expanded by almost a third, in other industries like agriculture and mining, employment was shrinking. While Scotland's economic and industrial basis was broadened through managed modernization, Grangemouth was becoming *less* diverse. Anxieties around Grangemouth's noxious industrial structure, and the town's inability to diversify, were expressed as early as the 1960s. Scottish Office officials emphasized the difficulties Grangemouth was facing in attracting new industry, observing that the economically viable sites in the area were owned by oil companies and thus unavailable for new projects.⁵⁵ In 1968 the Grangemouth Town Council bemoaned the fact that most of the remaining industrial land to be developed was owned by BP and other chemical companies, with only ten acres left for offer to other petrochemical firms.⁵⁶

Dependency on petrochemicals overlapped with the contraction of the labor force as this new industry was less labor-intensive than previous core activities, notably coal mining.⁵⁷ Despite the initial swell, the rate of growth of petrochemical employment was lower than the rate of population increase, and much lower than the rate of growth of ethylene manufacturing capacity and production. Michael Noble, Secretary of State for Scotland from 1962 to 1964, observed that the petrochemical industries attracted to Grangemouth did not meet the levels of employment anticipated under the various development strategies for the town.⁵⁸ The land-to-jobs ratio difficulties persisted throughout the decade, with the wider benefits of industrial expansion becoming the means through which negative impacts of the petrochemical industry's growth were justified. Correspondence in 1968 from the Economics Branch of the Scottish Office raised the question of whether capital-intensive industry should continue to be attracted to the area. The Scottish Office judged the petrochemical industry's intensive requirements on land were a worthwhile price to pay on the grounds that, "any industry is better than no industry," and that capital intensity would be offset by its stimulation of related sectors and local economy during the construction and operation phases of industrialization.⁵⁹

Noxiousness was sharpened by a local administrative structure that curtailed the Grangemouth Town Council's ability to address these concerns during these important stages of industrialization. Despite the position of success and prosperity Grangemouth had in the eyes of the Scottish Office, the town was granted what the Scottish Office deemed enough, and no more. Grangemouth was designated a small burgh and sat within the County of Stirling, which was responsible for approving or blocking the town's development proposals. This had a significant negative impact. In 1958, Stirling blocked housing plans proposed by Grangemouth on the basis they would impinge on the County's own building program.⁶⁰ The Grangemouth Town Council applied for large burgh status in 1962, which would allow it to operate independently, but this was successfully opposed by a coalition of local government authorities, including Stirling, and Scottish utilities interests.⁶¹ Despite ambitious plans to grow the

55. SEP 4/1945 Grangemouth Burgh Bill note of meeting 10 August 1962, NRS.

56. SEP 17/73 Comment on 1968 report, 10, NRS.

57. Mitchell, *Carbon Democracy*, 39-41.

58. SEP 4/1945 Grangemouth Burgh Bill note of meeting 10 August 1962, NRS.

59. SEP 17/73 Correspondence from the Economics Branch Press Office, 18 July 1968, NRS.

60. DD 12/2499 Correspondence from the County of Stirling to the Department of Health Scotland, 8 November 1958, NRS.

61. House of Commons, "Grangemouth Burgh Bill."

town, including a government strategy outlined in 1968 to achieve a population increase of 50,000 by 1986, Grangemouth was never granted fuller autonomy.⁶² Its population peaked below 25,000.

The Grangemouth Town Council navigated issues of financial security and autonomy in moral economy terms. Municipal representatives embraced the post-war British economic policy narrative of productivity and growth that had led to investment into the town's petrochemical infrastructure. Keen for industrial expansion, the Town Council took its own steps to attract industry by capitalizing on the town's attraction to the petrochemical sector—the skilled workforce, existing infrastructure, and the products of refining—contacting petrochemical industries directly and offering to offset the cost of utilities.⁶³ Despite difficulties recognized early on, the tone was largely hopeful. In 1965, the public information film *Grangemouth: A Growing Town* was released, in which the narrator, Scottish actor, Moultrie Kelsall, commended the “hard-working, enterprising and forward-looking town councils” who had adapted to the remarkable speed of industrial change since 1960.⁶⁴ In a similar tone, in 1959, the local newspaper, *The Falkirk Herald*, referred to Grangemouth as a pioneer, celebrating the overspill and development planning and what this would mean for employment and growth for the town.⁶⁵ Then in 1963, a special supplement in the same paper was titled “Productivity means Prosperity” and emphasized the role Grangemouth's growth was playing in reversing Scotland's economic decline by absorbing workforces being shed from heavy industries through its petrochemical sector.⁶⁶ Oral testimonies further emphasize the importance of this particular public memory. William Ballantine, who worked in Borg-Warner Chemicals in the 1960s, remembered meeting workers from Glasgow who had come to Grangemouth in the overspill: “they were quite happy with their luck,” he remarked, noting how jobs “for them were quite well paid,” compared with what they had previously enjoyed in Glasgow, most likely in heavy engineering, shipbuilding, and coal-based chemical industries.⁶⁷ The memory of this era of growth and prosperity persists even into recollections of the 1980s, despite the industry beginning to contract around this time. Jackie Laird, who worked at ICI in the 1970s, remembered how Grangemouth absorbed miners who lost their jobs during pit closures in the 1980s, and his pervading memory of the newly elected Thatcher government being “the fact that miners [sic] got rid ae a lot of people and we were employing them.”⁶⁸

BP's engagement in welfarist corporate practices influenced important customary notions that allowed the Grangemouth community to judge noxiousness as acceptable. This is emphasized in Anne Paterson's testimony. A Grangemouth resident born in 1940, Anne worked in BP Chemicals as a computer programmer during the early 1960s. Reflecting on how the industry was viewed locally, she remarked, “to begin with, wonderful. It was jobs, well-paid jobs. Secure work for life if you wanted it. They didn't seem to mind things like pollution because

62. Scottish Development Department and University of Glasgow. *The Grangemouth Falkirk Regional Survey and Plan*.

63. SEP 17/73 Report on BP and petrochemical infrastructure 1964, 10, NRS.

64. Gray, “Grangemouth.”

65. *The Falkirk Herald*, no title, April 25, 1959.

66. *The Falkirk Herald*, “Productivity Means Prosperity,” February 23, 1963.

67. Christie, “Chemical Glasgow,” in *Compound Histories*, ed. Roberts and Werrett, 312.

68. Jackie Laird, interview.

Grangemouth was quite a smelly place in those days.”⁶⁹ As well as jobs, the company also provided amenities for the locality including housing. A collaboration with BP (through Avon Housing Association [A.H.A.], formed by BP and BP Chemicals), the Grangemouth Town Council, and the Glasgow Corporation proposed to build 700 houses.⁷⁰ The social housing scheme was protected by the Grangemouth Town Council, with the contract stipulating the agreement could not be terminated without permission from both the Town Council and the Secretary of State for Scotland.⁷¹ A.H.A. houses sat alongside BP Oil houses, erected by the Company before World War II. Built for families with large gardens, and rent deducted from wages, these were maintained by BP’s own maintenance workers including plumbers, carpenters, and gardeners.⁷² For those who did not wish to relocate to Grangemouth and live in nearby shale refining towns like Broxburn, BP provided a free bus service to its oil and chemical works.⁷³ The material benefits provided by municipal administrations, BP, and the government embedded the petrochemical industry in the community, creating the “conditions of tolerable moral comfort” identified by Zonabend.⁷⁴ Particularly as this period saw a burgeoning environmental movement, the scant public activism against toxicity despite the community’s awareness of these issues reinforces the notion that these conditions subsumed urges to call for environmental change in the industry.

The moral economy was thus shaped around noxiousness on two levels. On one hand, local government and Scottish Office officials accepted the industry’s dominance over land because of the wider contribution it would make to the national economy, and on the other, residents accepted smells and pollution because of the provision of jobs and economic security. These moral economies strengthened each other. However, government elites and the community were responding to a vulnerable industrial base. Although the moral economy mitigated these concerns, it did not make the materiality of the issues in Grangemouth’s petrochemical expansion disappear. Constrained capacity for economic diversification laid the foundations for the employment crisis that emerged through the breakdown of the planning system in the next decade, contributing to the conditions within which noxious deindustrialization would arise. After BP’s moral economy promises were abandoned, the stark reality of industrial dependency would become unavoidable.

Noxious deindustrialization from 1970 to 1989

Noxiousness became more problematic after 1970 owing to changes in industrial and housing policy and local authority structures, compounded by shifts in energy politics and prices, including the impact of North Sea oil. Population changes serve as a rough proxy for this story, with Grangemouth’s population peaking in 1971 at 24,569 people and decreasing continually

69. Anne Paterson, interview.

70. *The Glasgow Herald*, “Grangemouth’s new industries: more factories and homes,” August 17, 1955, 9.

71. *The Grangemouth Advertiser and Eastern District Chronicle*, “Town council decide... Avon tenants can buy homes,” February 7, 1973, 1.

72. Lyon, *The Battle*, 12.

73. *Ibid.*

74. Zonabend, *Nuclear Peninsula*, 2.

Table 2. Population changes in Grangemouth from 1951 to 2020

Year	1951	1961	1971	1981	1991	2001	2011	2020
Population	15,432	18,857	24,569	21,599	18,517	17,906	17,373	16,240
		+3,425	+5,712	–2,970	–3082	–611	–533	–1133
		(+22%)	(+30%)	(–12%)	(–14%)	(–3%)	(–3%)	(–7%)

Source: *Census 1951* Scotland, Table 1, 15; *Census 1961*, Table 3A, 21; *Census 1971*, Table 2, 1; *Census 1981*, Table 3, 9; *Census 1991*, Table 1, 19; *Census 2001*, Table KS01, 88; *Census 2011*, Grangemouth Overview; *Grangemouth Settlement Profile 2020*, Demography.

from that year until the present day (see Table 2 below). It is this history of disappointment that Frank McKeever, convenor of the TGWU at BP Chemicals, spoke to when he expressed the workers' reaction to the news of BP's investment in 1989.

In October 1970, the Conservative government voted to end the system of industrial cash grants that had been implemented under the 1966 Industry Act, and which Grangemouth received, on the basis that Scotland was receiving too much government assistance owing to its small size. Characterizing the system as “indiscriminate and wasteful,” the Conservatives replaced this with tax-based allowances.⁷⁵ Weakening government support for the town meant that the connections between employment and industrial investment unraveled, bringing to the surface tensions that had existed prior to this time around the domination of an unsustainable industry. In 1972, Falkirk MP Harry Ewing, himself a former foundry worker, voiced complaints about the failure of the government to implement effective industrial policy to ensure secure employment for the locality. He remarked that “people in my constituency are being thrown out of work in industries that should be expanding and developing but which, because of the Government's economic policies, are neither expanding nor developing.”⁷⁶

Changes to housing policy saw further encroachment of economic liberalization, accentuating noxiousness. In 1972, A.H.A. proposed a right-to-buy scheme for the BP houses, allowing tenants to buy their houses from the company, ending the social housing scheme that had housed oil and petrochemical workers for decades. The Town Council argued in favor of protecting the scheme on the grounds that the chemical industry shedding jobs: “there has been a fair rundown in the petrochemical industry recently, and ... [we] considered that it would be very unfortunate for a person to lose his house one week and lose his job the next.”⁷⁷ The Council, however, lacked the administrative authority to govern independently and bargain against the government and BP. Under the auspices of the Conservative government, the Scottish Development Department sided with A.H.A., saying that there was no reason why tenants should not have the opportunity to buy their houses and that they must be sold at the market price estimated at £5000—significantly higher than the original value of £2000.⁷⁸ The policy change was finalized in 1973, exemplifying how local government protections were

75. PREM 15/636 Economic Strategy Committee's note to the Prime Minister 20 September 1971, TNA.

76. House of Commons, “Scotland (Unemployment).”

77. PREM 15/636 Economic Strategy Committee's note to the Prime Minister 20 September 1971, TNA.

78. *The Grangemouth Advertiser and Eastern District Chronicle*, “Oil houses: new move,” September 27, 1972, 1; *The Grangemouth Advertiser and Eastern District Chronicle*, “Oil houses: new chapter,” September 20, 1972, 1.

diminishing in the face of liberal economic policy. This also signaled a shift in BP's attitude to corporate social responsibility to its workers and the wider community.

This disappointment was compounded in 1975, when, under the Local Government (Scotland) Act 1973, small burghs were abolished and put under the administrative authority of new district councils, which themselves sat in larger regions. Grangemouth became part of Falkirk District—much bigger than the old Falkirk burgh, and which was one of three districts within the newly assigned Central Region. This resulted in Grangemouth losing hold of the industry rates it had previously had sole control over. From this point, there was a progressive decline in tax revenue, with the proceeds of non-domestic rates spread across Falkirk District rather than concentrated in Grangemouth, significantly diluting the benefits the town received from the petrochemical industry.⁷⁹ The ambitions of the old Town Council could no longer be fulfilled as they lost control of financial resources that had contributed to the building of schools, shopping centers, and community spaces. Grangemouth residents perceived this as the point where the relationship between industry and community was broken.⁸⁰ Yvonne Flemming, a Grangemouth resident born in 1971 reflected on these changes with explicit reference to noxiousness. During an interview in 2023, she said “when we were young ... we used to get lower rates because we lived in Grangemouth because we were having to live next to a plant,” now, “we don't get anything to subsidize living here and breathing in chemicals every day.”⁸¹ The reflection shows how deeply this event persisted in public memory, as Yvonne was born only a few years before local government reorganization and made this observation around fifty years after the transfer happened.

Assault on the moral economy was sharpened by the mounting energy crisis, with an upward trend in oil prices accelerating in 1973. UK production of petrochemicals fell as companies reduced capacity, with BP and ICI—the two major British chemical employers in Grangemouth—bearing the brunt of these changes. Cutbacks were felt more strongly in Britain than in any other European country.⁸² The UK's production facilities for ethylene, which stood at 60 percent of Western European capacity in the mid-1950s had reduced to just 12.5 percent by 1975.⁸³ Then, from 1976 to 1979, Britain's trade deficit in plastics grew from £136 million to £300 million as market demand weakened in Europe, giving way to growing competition from postcolonial petroleum-producing countries capitalizing on their natural resource advantages.⁸⁴ At an annual foremen's dinner of BP Chemicals in 1972, Bob Fenning, a BP manager in Grangemouth, reported on the anxieties the company had within this climate, reviewing possibilities for expansion before making new investments.⁸⁵ This was echoed a few years later, with Fenning quoted in the *Financial Times*, “we are suffering from a cash flow crisis bigger than any other crisis ... we are not generating enough to build plants to meet the

79. Feltrin et al., “Noxious Deindustrialization,” 959.

80. Schlüter et al., “Enough Is Enough,” 720.

81. Yvonne Flemming, interview.

82. Geels, “Conflicts,” 9.

83. SEP 1/107 Cutting from *Financial Times* January 1976, NRS.

84. Ilgen, “Better Living Through Chemistry,” 669.

85. *The Grangemouth Advertiser and Eastern District Chronicle*, “Brighter future ahead predicts BP boss,” June 7, 1972, 5.

Table 3. Privatisation of BP

Date	Remaining government shareholding	Net proceeds (£ millions)
June 1977	51%	560
October 1979	46%	276
June 1981	46%	8
September 1983	31.5%	543
October 1987	0	5,504

Source: Hoopes, *The Privatization of UK Oil Assets 1977-1987*, 70; Rhodes et al., *Privatisation: Research Paper 14/61*.

demand in the future.”⁸⁶ While much of these costs were recovered by the late-1990s, the oil shocks turned the petrochemical sector from one guaranteed cheap feedstock and fixed-cost capital-intensive infrastructure to a more volatile one where crude oil feedstock became the dominant cost factor.⁸⁷

During the energy crisis, in 1975 BP opened the Forties Pipeline System, an offshore and onshore 130-mile pipeline transporting crude oil from the Forties Field in the North Sea—still the largest field to have been discovered in British territorial waters—to Grangemouth’s Kinneil Terminal. But with the moral economy dismantled, expansion of activity at the BP Chemicals complex was accompanied by reduced rather than increased employment, with the company cutting its Grangemouth workforce in 1981 by 250 people.⁸⁸ Noxiousness was then exacerbated by changes in the ownership of BP, which became an increasingly private entity through the government’s sale of its public shareholding in the company from 1977 to 1987 (see Table 3 below).⁸⁹ Importantly, this meant the abandonment of the “golden share,” which allowed the government to outvote all others and veto BP’s corporate decisions.⁹⁰ Consequently, Grangemouth witnessed the domination of an increasingly “private” entity within the town that felt less accountable to public pressure. BP had more freedom to invest in the most profitable areas of its international business rather than being guided by national interests: employment in the oil and chemical industry decreased, with North Sea oil investment made not to produce jobs, but to secure greater profitability for the company. *The Falkirk Herald* reported on 24 October 1982 that, “if there is a large oil field in the North Sea and the refining takes place at Grangemouth, it will not mean a jobs bonanza. The result will be that less foreign oil will be imported.”⁹¹ On top of employment anxieties, this indicated the growing sense that Grangemouth would become merely a transit point for international private business.

With the government position shifting toward the consolidation and strengthening of private power over state control, in the late 1970s, the Labour government (elected in 1974) and its newly created arm, the Petrochemical Sector Working Party (PSWP), was criticized for its political position favoring private business interests. This was a legacy of the post-war

86. House of Commons. “BP International Limited.”

87. Chapman, *International*, 176.

88. Fraser, “The Scottish Economy,” 12.

89. Rhodes et al. “Privatisation,” 14.

90. Hoopes, “Privatization,” 70.

91. *The Falkirk Herald*, “Oil boost for port,” October 24, 1982.

modernization agenda which advocated for strong corporate relations within industrial strategy.⁹² In November 1978, the Association of Scientific, Technical and Managerial Staffs Union (ASTMS), representing white-collar and supervisory staff in petroleum industries, walked out of the PSWP in protest of the power that multinational corporations like BP and ICI, both present in Grangemouth, had in formulating national energy policy.⁹³ Their specific complaint was that these multinationals should have to face more restrictions to better meet Britain's industrial needs, as Britain's reliance on imports to meet its demand for plastics was increasing (the nation's plastics imports had increased from 30–36 percent between 1976 and 1978).⁹⁴

As jobs were cut, investment plans into North Sea oil infrastructure and corresponding petrochemical development increased. This was exemplified in the publication of the Scottish Development Department (SDD) and Scottish Development Agency (SDA) National Planning Guidelines throughout the 1970s and 1980s. In light of North Sea oil discoveries, these guidelines advised planning authorities on how to implement development proposals while safeguarding land for onshore oil and gas infrastructure.⁹⁵ For Grangemouth, 716 hectares were identified to be safeguarded for petrochemical development: Grangemouth BP complex and Kinneil Kerse (470 hectares, half of which was owned by BP, and where the Forties Pipeline System ends). Of the full 716 hectares, 208 hectares were undeveloped, 164 hectares of which were owned by BP and 40 owned by ICI.

Though not strict policy, the guidelines reflected a noxious industry disembedded from the community. The reception of the guidelines was contentious, with noxiousness recognized in the local government's response. In the Grangemouth Local Plan, a 1984 report on the local authority's implementation plans of the National Guidelines, Falkirk District Council wrote with reference to BP, "the fact that 164 hectares of the undeveloped land is owned by one company may be operating as a limiting factor on the potential for diversification of industry in Grangemouth."⁹⁶ The identification of BP-owned industrial land revealed that the industrial structure was at odds with Grangemouth's need for economic security and that the town was vulnerable to the economic priorities of the national government and private business. Heightened criticism of the industry was reinforced by key lobby groups. In 1981, the Director of the Nature Conservancy Council, John Boyd, wrote to the Department of Health that the safeguarding of the Grangemouth area for petrochemical development "gives rise to serious concerns on nature conservation grounds," specifying that the guidelines put areas of Grangemouth at risk of being absorbed by industrialists.⁹⁷ The fact that concerns over land use and petrochemicals were now being raised by a UK government agency—entities beyond local authorities—on grounds of international importance underlines growing awareness of the disadvantages and unsustainability of this economic structure in Grangemouth.

92. Phillips, *Industrial Politics*, 21–22.

93. Forester, "Notes," 458.

94. *Ibid.*

95. Scottish Development Department. *National Planning Guidelines 1981*.

96. A1058.039 Grangemouth Local Plan Survey Report May 1982, 21, Falkirk Archives.

97. DD 12/3697, Letter from Dr John Morton Boyd of the Nature Conservancy Council to Mr H Orr of the Scottish Development Department 15 June 1981, NRS.

Cumulatively, this industrial setup functioned as a blockage on alternative development, particularly amidst growing health and safety regulations. Under the new organization of local government, Falkirk District Council expressed an urge for economic diversification in Grangemouth and argued that the hazardous setup of residential and petrochemical facilities so close to each other left the town with extremely limited options for building future infrastructure without breaching planning regulations laid out by the Health and Safety Executive (HSE).⁹⁸ The HSE had, since its conception in 1975, sought to manage the growth of populations near major industrial sites, and outlined that hazardous infrastructure including chemicals needed to be located as far as possible from nearby communities.⁹⁹ Clearly, Grangemouth was already in breach of these guidelines. Given the limited health and safety guidance in place when petrochemical facilities were constructed following World War II, as well as the lack of knowledge of the toxic health impacts of plastic production, a large number of hazards, as well as local amenities, existed near one another.¹⁰⁰ As established earlier on in this article, industrial development from 1960 had positioned the oil and petrochemical works a short walk from the nearest houses, playing fields, football grounds, and local schools, while the town's main road ran right through the complex. That the town's representatives could express concerns on these grounds, despite the existence of this risk for decades, demonstrates that the industry's presence was now considered a limitation to economic security.

In 1982, the *Falkirk Herald* reported Falkirk District Council bemoaned that BP was polluting the town and that the environmental and health consequences for the land and the people should have greater priority. The article made the overt recognition that in the past these risks had been tolerated, reporting that the “material benefits of paying host to the industry have, almost inevitably, overshadowed any potential hazards,” and that “the traditional silence on the potential threat to public safety posed by the petrochemical industry has been rudely broken.”¹⁰¹ This represented a wider shift toward recognizing and confronting pollution as seen in the growth of environmental movements of the time. In Scotland, controversy around the Re-Chem hazardous waste incinerator in Bonnybridge, a settlement in Falkirk District only 10 miles from Grangemouth, saw heightened scrutiny around unusually high rates of rare diseases in the Falkirk area before its closure in 1984. A local doctor reported that in Falkirk around three or four babies a year were born with eye defects, compared with one or two a year in localities with parallel birthrate levels.¹⁰² Between 1953 and 1980, a study—which included Grangemouth in its scope—found that leukemia rates in children born near hazardous sites including oil and petrochemical sites were 20–30 percent higher than those not in the vicinity of such infrastructure.¹⁰³ From 1979 to 1990, hospital admissions for asthma increased by over 200 percent in the Forth Valley area (within which Grangemouth is situated).¹⁰⁴ These hazards, as *The Falkirk Herald* highlighted, were previously known, and

98. A1058.039 Grangemouth Local Plan Survey Report May 1982, Falkirk Archives.

99. Health and Safety Executive, “HSE’s land use planning methodology,” <https://www.hse.gov.uk/landuseplanning/methodology.htm#background> (accessed May 17, 2024).

100. Mah, *Plastics Unlimited*, 33.

101. *The Falkirk Herald*, “Price of Prosperity Too High?,” July 3, 1982.

102. *The Herald*, “The Heart of Darkness,” July 2, 1997.

103. Knox and Gilman, “Hazard proximities of childhood cancers.”

104. *The Herald*, “The Heart of Darkness,” July 2, 1997.

tolerated, by the community. With the headline, “Price of Prosperity too high?,” the article represented a marked shift from the clarion call to prosperity the newspaper had made in previous decades which linked this to the national narrative around productivity and celebrating BP and Grangemouth in relation to this.

Growing environmental awareness meant BP became regulated by tighter standards.¹⁰⁵ Workplace health and safety at BP’s Grangemouth site came under the jurisdiction of the Health and Safety Act 1974, Factory Acts (legislation passed throughout the twentieth century to improve workplace health and safety), and the Control of Industrial Major Accident Hazards Regulations (CIMA) 1984. In this new institutional context, in 1979, Falkirk District Council filed a complaint to BP Chemicals for the noise pollution caused by flaring at the site (a process of burning hydrocarbon gases for safe disposal to reduce excess pressure).¹⁰⁶ The SDD’s priorities of clean air conflicted with the local authority’s priority of minimizing noise pollution.¹⁰⁷ Strategies discussed included efforts to control the noise by using steam, although to ensure both sides were kept happy was an expensive trade-off.¹⁰⁸ While the issue of noisy flaring persists today,¹⁰⁹ the discussions demonstrate the influence of new legislation, and that community concerns were something to take seriously—capturing the shift toward recognizing and confronting pollution identified by *The Falkirk Herald*. This continued into the late 1980s as BP was fined for health and safety offenses. In 1988 BP was fined £250,000 under the Health and Safety Act after a fire killed two men following the removal of a valve in a flare line, and £500,000 for an explosion in a hydrocracker unit that killed one worker.¹¹⁰ The HSE drew a comparison between this and the 1974 Flixborough disaster in eastern England—an explosion in a Nypco UK chemical plant and one of the worst in the UK chemical industry’s history—demonstrating its scale and significance.¹¹¹

The two-decade-long trend in noxious jobless growth was consolidated by declining interest and demand in the petrochemical sector throughout the 1980s. The petrochemical sector was facing severe overcapacity by this point as a mature industry, and in 1986, oil prices dipped.¹¹² BP and other oil majors cut capacity drastically, divesting from onshore activities like oil refining and petrochemicals, and concentrating investment into upstream activities like exploration, drilling, and extraction.¹¹³ Across Britain, twelve petrochemical plants closed from 1981 to 1982, and throughout 1980, over twenty BP Chemical plants were closed

105. Jones, *Profits and Sustainability*, 359; Bergquist, “Renewing business history,” 10-11; Hoffman, *Heresy to Dogma*, 64-67.

106. INEOS. “A Guide to Flaring.” 2012. https://www.ineos.com/globalassets/ineos-group/grangemouth/community/4429_ineos_flaring_dec12_v2.pdf (accessed May 15, 2024).

107. DD9/486, Letters between D.A. Dickson (HM Industrial Pollution Inspectorate for Scotland), Mr Henderson (Principal Officer on Air Pollution Noise for Falkirk District Council), and Mr Luxon (General Manager of BP Chemicals) between September 10, 1979, and October 1, 1979, NRS.

108. DD9/486, Meeting held with Mr. Luxon, General Manager of BP Chemicals, and the SDD, September 28, 1979, NRS.

109. Mah, *Petrochemical Planet*, 132.

110. Health and Safety Executive, “The fires and explosion at BP Oil Refinery,” 1.

111. Ibid.

112. Chapman, *International*, 238.

113. Tuckman, “All better together?,” 134; Grant, “The United Kingdom,” in *The Global Chemical Industry*, ed. Galambos et al., 303; BP, “Late Century,” <https://www.bp.com/en/global/corporate/who-we-are/our-history/late-century.html> (accessed May 21, 2024).

globally and the workforce was cut by half.¹¹⁴ In Grangemouth, from 1979 to 1985, the company's chemical workforce was reduced from 2,300 to 1,250, and the town's population shrank for the first time in 1981 since its continuous growth between 1951 and 1971.¹¹⁵

In November 1985, Harry Ewing, Labour MP for Stirling, Falkirk, and Grangemouth, appealed to his fellow members of parliament to understand the pervasiveness of long-term unemployment his constituency suffered following BP's decision to pay off 300 workers in the refinery and slash a further 300 in the petrochemical plant.¹¹⁶ Within these changes, investment to replace old units continued because of cost competition: the commissioning of new plants was directly responsible for the closure of others, while BP and ICI entered into joint ventures to transfer ownership of some facilities and shut down others.¹¹⁷ Crucially, however, in Grangemouth, the shrinkage of the workforce was not followed by plant closures and industrial unrest as was experienced elsewhere in 1980s Scotland such as the factory occupations in Timex in Dundee and Caterpillar in South Lanarkshire, as well as the 1984-1985 miners' strike.¹¹⁸ Grangemouth was kept open because of its strategic importance to the company. Cumulative job losses worsened noxiousness in the chemical plant: it was BP Chemicals' job cutbacks at its Grangemouth site, according to ASTMS and TGWU union officials, as well as a Scottish Environment Protection Agency (SEPA) representative, that was contributing to rising incidents and hazards in the BP complex because important maintenance expertise was lost.¹¹⁹

Chronic unemployment and noxiousness were recognized by Michael Connarty when he succeeded Harry Ewing as Labour MP for Falkirk East. In his 1992 House of Commons maiden speech, opening with a celebration of the town's petrochemical industry and particularly BP Chemicals' 1989 investment, Connarty spoke in moral economy terms. He highlighted the disparity between the investment and persisting joblessness, remarking that "all is not what it once was," and that the town as well as surrounding settlements like Polmont, once crucial to industry in Grangemouth, had been "shipwrecked by the tides of economic change."¹²⁰ His speech also expressed sympathy with British chemical firms in the town over the lack of government protection for British industry from imports. Importantly, Connarty highlighted the closure of an ICI anthraquinone production plant in Grangemouth, attributed in part to the difficulties in raising it to European standards of airborne emissions. ICI's choice, however, to build a plant in India and import the anthraquinone to the UK, had "left a sour taste in the mouths of local people," a literal and figurative assessment of how residents were responding to pollution, noxiousness, and the fractured moral economy that saw unjust employment practices maligning the town. Connarty also urged the UK government to grant local

114. Oil and Gas Journal, "Watching the World Horton Replaced as Chief of BP," July 6, 1992, <https://www.ogj.com/home/article/17219760/watching-the-world-horton-replaced-as-chief-of-bp> (accessed July 5, 2024); Chapman, *International*, 250.

115. *The Glasgow Herald*, "300 jobs shed at BP plant," July 12, 1985, 5.

116. House of Commons, "Enterprise And Employment."

117. Chapman, *International*, 250.

118. Wright et al., "Defending the Right to Work," 65; Gibbs and Phillips, "Who Owns a Factory?," 114-115.

119. A1456.172 Cutting from *The Scotsman* 24 March 1987, Falkirk Archives; *The Herald*, "The Heart of Darkness," July 2, 1997.

120. House of Commons, "Debates for 13 May 1992."

authorities the regulatory power to enforce emission standards, reinforcing again the two-decade-long call for stronger local government authority to enforce the very standards and legislation being set at a national level.

While communicating partisan perspectives by speaking as a Labour MP, Connarty's assessment of Grangemouth's economic situation went beyond party politics and a critique of the Conservative government. The MP was articulating a response to a specific context of deindustrialization, linking historical economic change, noxiousness, and changing government priorities. Connarty articulated the need for not just any employment, but secure employment, which BP and the petrochemical sector were unable to provide in its current state. These elements, he alluded, were intimately tied to BP's 1989 investment, an investment that shone a spotlight on the seemingly contradictory situation facing the town: employment contraction combined with massive industrial investment.

Conclusion

For over half a century, Grangemouth has sat at the center of Scotland's energy economy. In 1951, BP commissioned its first petrochemical plants in Grangemouth, and from thereon, the industry grew rapidly along with the township. By 1989, however, amid deindustrializing Scotland, BP Chemicals in Grangemouth was facing job losses, safety issues, and vocal opposition to pollution. Feltrin et al., recognizing this noxious industrial structure in present-day Grangemouth, introduced "noxious deindustrialization" as a framing for the paradoxical relationship between continued noxious production output and shrinking employment. This research adds to this important contribution with a historical approach that pinpoints BP's 1989 investment package as an early example of the phenomenon. Analysis of post-war economic restructuring of Grangemouth's petrochemical industry is situated in Polanyi's critique of industrial capitalism, which illuminates broad structural forces of liberal market encroachment that disembedded petrochemical activity in the locality. Moral economy analysis shows how this was mediated by community-level expectations of just employment practices, as developed by Thompson and extended on in the context of deindustrializing Scotland by Gibbs, Phillips, and Perchard. This article advances this theoretical framing through its integration with Feltrin and Sacchetto's conceptualization of "noxiousness." The resulting conceptual framework deployed in this article, the moral economy of noxiousness, grounds historical analysis of Grangemouth and reveals historical connections between justice, the environment, and industry.

Early growth of the petrochemical industry embedded the sector in the township. Regional and local planning programs that earmarked Grangemouth and its petrochemical industry for development provided investment into housing, schools, and urban development necessary for the new industrial workforce, while the locality received industry rates from BP's petrochemical activity. But concurrently, growth laid foundations of noxiousness, with the sector absorbing land and inhibiting the development of labor-intensive alternatives. While awareness of noxiousness grew as production expanded, this was tolerated because of rising employment, a perspective emphasized by oral history testimonies. The year 1970 is identified as a critical turning point that came when noxious deindustrialization was triggered by

policy changes in the industry, housing, and local authority structures, a finding qualifying usual emphasis in Scottish history of deindustrialization in post-1979. Cumulatively, these changes weakened the link between petrochemical investment and jobs which made noxiousness less tolerable and legitimate in moral economy terms. This trend was sharpened by the energy crisis that saw huge job losses in the oil and chemical sector amid the strengthening of the private corporate power in BP. BP's 1989 investment was made in the context of an industry disembedded from the community. Failing to boost local employment, the sector was actively maligning the town through the socio-environmental harms caused by noxious petrochemical production.

The long historical analysis achieved in this article reveals hitherto unexplored aspects of noxiousness pertaining to the land-intensiveness of petrochemicals, which hindered economic diversification, locking the town into a noxious development path. The approach also establishes the existence, awareness, and negotiation of noxiousness throughout industrialization. Together, these findings help explain fossil fuel dependency experienced in Grangemouth today and could form the basis for future historical research into the deindustrialization of carbon-intensive sectors in other localities across the UK. This is an especially important issue in the context of contemporary energy transition debates.¹²¹ Though the Scottish government today recognizes Grangemouth and its concentration of industrial activity as an important focus of the just transition, petroleum-based production persists.¹²² In 2023, INEOS, the private multinational petrochemical company that bought the Grangemouth complex from BP in 2005, announced the refinery's closure by 2025.¹²³ With plans to convert the site into a fuel import terminal, shedding 400 out of 500 jobs and reinforcing dependency on fossil fuels, Grangemouth workers consider this an unjust transition.¹²⁴ As this article has demonstrated, historical path-dependencies have made shifting away from a carbon-intensive mode of production difficult. Community and workforce articulations of injustice around this noxious industrial structure have a long pedigree, with roots in the jobless growth of the 1970s, and even further back to the highly noxious industrial expansion of the 1950s.

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121. Rosenberg, "No Jobs on a Dead Planet," in *Just Transitions*, ed. Morena et al., 41-43.

122. Scottish Government. "Just Transition for the Grangemouth industrial cluster: discussion paper," September 23, 2023, <https://www.gov.scot/publications/discussion-paper-transition-grangemouth-industrial-cluster/> (accessed September 25, 2024).

123. INEOS. "'Business as usual' for INEOS businesses at Grangemouth." Press Release. September 12, 2024. <https://www.ineos.com/news/ineos-group/business-as-usual-for-ineos-businesses-at-grangemouth/> (accessed September 24, 2024).

124. Gibbs and Shibe, "The Grangemouth refinery Closure: Workers' Perspectives," July 18, 2024, 21-22.

doctoral research cannot be made available until at least twelve months after the completion of the project, which will likely be in December 2025. The rest of the data cited in the article are publicly available in the UK, Scottish government, and regional government archives, as well as the National Library of Scotland. Historic maps of Grangemouth are available, online, from Edina's Historic Digimap archive.

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