

Introduction

Following WWII, as oil displaced coal-based manufacturing as the basis of the global economy, oil majors diversified into petrochemicals, which used oil as feedstock to produce chemicals involved in the production of plastics and synthetics. Between 1950 and 2015, the annual global production of plastics grew by 200 times.¹ Britain led this transition as the first country in Western Europe to use crude oil feedstock for chemical production, and from 1948 to 1958, invested the nominal value of \$280 million into the sector, more than any other industrial sector.² Petrochemicals, in sum, captured the nation's shift away from coal-based manufacturing and its post-war march towards a new, modern industrial structure. The Anglo-Iranian Oil Company (becoming BP in 1956) pioneered Britain's advance in the industry, incorporating BP Chemicals in 1947 (a joint venture with The Distillers Company)³ and commissioning Europe's first petrochemical plants in 1951 in Grangemouth, an oil refining town in Scotland's central belt. By 1970, BP Chemicals' total production capacity of all chemicals in Grangemouth had grown from 80,000 in 1951 to 750,000 tons.⁴

Petrochemical production and its products have endured to this day, but at a cost. Anne Paterson, a computer programmer at Grangemouth in the 1960s, described this in a life-course oral history interview conducted in 2023:

*People didn't realise the damage it [petrochemicals] was doing, and [British] Hydrocarbon Chemicals made these plastic pellets, which then went onto other factories to get made into things like telephones, and basins. Plastic was a wonderful material in those days ... I'm still using Tupperware that I bought in the 1960s. That's how enduring good quality plastic can be.*⁵

It was not just its products that endured, but the industry itself and its environmentally destructive properties. Capital- and land-intensive, its growth crowded out alternatives, curtailing sustainable, long-term economic security, and bringing with it pollution and toxicity. This intensified amid the growth of climate consciousness in the 1960s and 1970s, especially as this coincided with falling employment in petrochemicals.⁶ Today, Grangemouth contributes six percent of Scotland's total greenhouse gas emissions, and the industrial cluster contributes 33 percent of total emissions from companies in Scotland.⁷ Despite being at the centre of the Scottish net zero agenda, the site has failed to transition to green renewable infrastructure.⁸ As well as being a major concentration of polluting activity, over the past decade, Grangemouth has scored consistently and disproportionately high on the Scottish Index of Multiple Deprivation (SIMD).⁹

This paper explores the toxic political economic of petrochemicals: both the damaging elements of its production, and its endurance as an industry, thereby shedding light on fossil fuel

¹ Adam Hanieh, "Petrochemical Empire," 49.

² Peter Spitz, *Petrochemicals*, 365.

³ British Petroleum Chemicals was renamed British Hydrocarbon Chemicals in 1956. In 1967, the company was renamed BP Chemicals following BHC's acquisition of The Distillers' Company. This article will refer to the company as BP Chemicals for consistency.

⁴ Neil Dalgleish, *BP In Scotland*, 27.

⁵ Anne Paterson, *interview*.

⁶ Riyoko Shibe, "Moral Economy of Noxious Industry".

⁷ Climate Change Committee, Letter to Cabinet Secretary for Environment Climate Change and Land Reform, 27, 2020.

⁸ Gibbs, Ewan, and Riyoko Shibe. "Workers' Perspectives," 21-22.

⁹ Falkirk Council, "Council Democracy: SIMD Report" <https://www.falkirk.gov.uk/services/council-democracy/statistics-census/docs/simd/Scottish%20Index%20of%20Multiple%20Deprivation%20Report%202020.pdf?v=202001281540> (Accessed 14 January 2025.)

dependency experienced today. To examine these trends, the analysis focuses on the period of industrial growth from 1951, the commissioning of the first petrochemical plants in Grangemouth, to 1966, the peak of regional chemical employment. Archival material is sourced from national and local government as well as BP. Specifically, Development Department, Industry Department, and Scottish Economic Planning Board files are sourced from the Scottish Office of the UK government, highlighting trends in regional industrial policy. Treasury, Board of Trade and Department of Energy records from the UK government reveal correspondence on relations between the government and BP. BP educational documents further illuminate company and market trends.

Analysis

Grangemouth held vast potential for Anglo-Iranian and policymakers to grow the budding petrochemical industry. In 1951, Europe's first petrochemical plants were commissioned in Grangemouth producing ethylene, the most important and widely produced petrochemical, and propylene.¹⁰ The location was unique in that its existing refinery capacity, undeveloped flat lands adjacent to the refinery, and large docks providing access to international trade and feedstock allowed Anglo-Iranian to develop an integrated refinery and petrochemical complex.¹¹ Grangemouth was the first integrated complex in Britain. Integration allowed the company to take full advantage of the benefits that diversification into petrochemicals allowed. Land ownership and refining capacity, for instance, saw raw materials and by-products transferred easily between the petrochemical complex and refinery.¹² Other sites in Britain at the time were distant and connected by pipeline, like BP Chemicals in Baglan Bay, opened in 1963, connected to Llandarcy refinery by pipeline; and the Carrington Chemical works, opening in 1951 and connected to Shell's Stanlow refinery on Merseyside in 1960.

Anglo-Iranian's access to abundant oil in the Middle East, and Distillers' expertise in chemical production saw BP Chemicals grow rapidly, its success evidenced in the rate of growth of petrochemical operations. The company's first two plants had a modest combined initial capacity of 88,600 tons per annum; 1956-1960 saw a huge leap forward with a further 230,300 tons of capacity created, trebling operations.¹³ Archive research emphasises the importance joint ventures, which granted Anglo-Iranian access to important expertise and market knowledge that allowed the company to diversify production and dominate the petrochemical market. The dawn of the decade saw growing demand for polystyrene plastics for bags, toys and electrical goods, and in 1953, Anglo-Iranian responded to this through formation of Forth Chemicals, a joint venture with Monsanto Chemicals, commissioning a styrene monomer plant. Then, in response to rising demand for synthetic detergents in Britain and the U.S., Grange Chemicals was formed in 1955 with Oronite Chemical Company, a subsidiary of Standard Oil Company, with a detergent alkylate plant commissioned that year. BP Chemicals joined Imperial Chemical Industries (ICI) (a chemical company also present in Grangemouth) to form Border Chemicals in 1963, becoming the sole British producer of acrylonitrile, polymerised to create acrylic fibres in fabric, until 1970.¹⁴

Through diversification and rapid growth, BP Chemicals maintained competitive advantage against its competitors, Shell and ICI, outstripping their ethylene capacity.¹⁵ The company commissioned its second ethylene plant in 1956 with an initial capacity of 30,000 tons per annum, and

¹⁰ BP Society, 'Grangemouth at 100,' <https://bpsociety.co.uk/grangemouth-at-100/> (accessed September 24, 2024).

¹¹ Bamberg, *British Petroleum*, 347.

¹² Chapman, *The International Petrochemical Industry*, 86–87.

¹³ Bamberg, *British Petroleum*, 353.

¹⁴ *Ibid.*, 28-29; British Hydrocarbon Chemicals Ltd., *British Hydrocarbon Chemicals*, 5

¹⁵ Bamberg, *British Petroleum*, 374-375.

its third in 1960 with a greater capacity than the first two plants combined of 70,000 tons, which was the largest plant of its kind in the world outwith the USA. By 1963, BP Chemicals was the biggest producer of ethylene in the UK, demonstrating its dominance in the UK petrochemical market.¹⁶ Other petrochemicals the BP dominated included production of polybutenes (with wide-ranging application including in sealants, adhesives and cosmetics), beginning in 1961, increasing from 35,000 tons to 50,000 tons by 1970, with BP Chemicals the only producer in Britain and its Grangemouth plant one of the largest in the world.¹⁷

BP Chemicals' success saw Grangemouth established as the prestigious, thriving centre of petrochemicals and plastics, and of the unique, modern materials which would, as Anne expressed, "last a lifetime." Recognising this, policymakers earmarked Grangemouth for official expansion as part of national industrial modernisation plans shifting Britain away from reliance on heavy industry. This included the New Town programme initiated in 1947, which sought to redistribute the workforce away from overpopulated urban centres like Glasgow to modern industrial settlements across Scotland, home to budding modern industries like electronics, engineering, and in the case of Grangemouth, petrochemicals.¹⁸ Though not designated a New Town due to its small size, Grangemouth Town Council received a grant under the 1957 Housing and Town Development (Scotland) Act which built on the New Town programme. 700 houses, a shopping centre, school and industrial state were built, with a portion of Glasgow's 'overspill' population moved into Grangemouth's new housing schemes.

In 1963, the White Paper for Central Scotland was published, building on this programme of labour redistribution, which identified Grangemouth as a 'growth area' along with other settlements across Scotland's central belt.¹⁹ These areas were designed to attract industry through financial incentives and investment into industrial sites, road networks and housing. Together, these growth policies recognised Grangemouth's position in the nation's modern economy, marked for its "economic vitality" with the town's thriving petrochemical infrastructure indicating a "remarkable capacity for change and expansion".²⁰ As a result, Grangemouth's population grew from 15,400 to 18,800 between 1951 and 1961, peaking in 1971 at 24,500. Regional chemical employment, too, grew from 4,000 to 7,000 between 1951 and 1966.

Table 1: Population changes in Grangemouth from 1951 to 2021

Year	1951	1961	1971	1981	1991	2001	2011	2021
Pop	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.

But growth of the township coupled with BP Chemicals' unabated expansion failed to bring long-term, sustainable security for the locality. From 1966, regional chemical employment began to contract, and the population never increased beyond its 1971 level (see Table 1). Though processes of deindustrialisation began in earnest in 1970,²¹ archival record shows awareness of these risks as early

¹⁶ Ibid., 357–58.

¹⁷ Dalgliesh, *BP in Scotland*, 29.

¹⁸ Ian Levitt, "New Towns."

¹⁹ Cmnd 2188, *Central Scotland: A Programme for Development and Growth* (London: HMSO, 1963).

²⁰ TNA T 224/1027. Chapter 2 page 5 of draft White Paper for Central Scotland Cmnd 2188, 1963

²¹ Shibe, "Moral Economy of Noxious Industry," 14-16.

as 1960, with Grangemouth's administrative officials expressing concern that the town was becoming overly dependent on a single, capital- and land-intensive industry. Scottish Office officials bemoaned the fact that all available industrial land was being swallowed up by BP Chemicals at a rapid rate leading to difficulties attracting alternative industry to Grangemouth. All economically viable sites in the area, they observed, were owned by oil companies like BP and were thus unavailable for new projects.²² By the end of the 1960s only ten acres remained for the Grangemouth Town Council to offer to other firms,²³ giving little room for industrial diversification and economic security.

Moreover, the industry was failing to attract adequate jobs. Relying on highly technical automated processes meant that petrochemicals could expand without requiring extra labour.²⁴ This meant that though chemical employment was increasing in this first decade of operations, the rate of this growth was lower than the rate of population increase, and much lower than the rate of growth of ethylene manufacturing capacity and production. Scottish Office planning documents evidence awareness of this as early as 1960. In a meeting with Michael Noble, Secretary of State for Scotland, Stirling County Council (in which Grangemouth was situated) expressed concern that petrochemical activity in Grangemouth was failing to attract jobs, and thus failing to meet requirements of the 1963 White Paper that stipulated industrial expansion must stimulate employment growth.²⁵

The industry's environmentally damaging components were accentuated by an administrative structure that curtailed Grangemouth Town Council's power and autonomy vis-à-vis BP, a globally operating oil major. The Town Council was not granted power beyond what the Scottish Office deemed enough, which had significant negative impact. Withholding New Town status, for instance, curtailed what the township could achieve by limiting access to central funding. With Grangemouth a small burgh sitting within Falkirk County, Stirling County, and West Lothian County, the Town Council had to pass proposals through these authorities for funding to be granted. In 1962, Grangemouth Town Council lobbied government to be granted large burgh status, which would give the council autonomy over development and open up available industrial land by extending its boundaries into Stirling and West Lothian. This, however, was denied by a coalition of these local government authorities and Scottish utilities interests.²⁶

With limited autonomy, and a vulnerable economic structure dependent on a single industry, Grangemouth was unable to respond to challenges facing the industry by the end of the 1960s. Profitability declined as petrochemicals matured and faced overcapacity, and then in the 1970s two major oil shocks hit, as well as changes in government that removed the planning system that had established Grangemouth's prominence in the 1960s. Industrial grants were replaced with tax-based allowances; industry rates once concentrated in Grangemouth were diluted, spread across the wider region; and BP was gradually privatised.²⁷ Petrochemical activity, no longer attached to population and employment growth, continued unabated, maligning the town, bringing toxicity and socioeconomic difficulties related to lack of employment and opportunity. The outcomes, then, of being dependent on petrochemicals was that the town became poorer, with negative overlapping and reinforcing social, economic and environmental trends.

Conclusion

²² NRS SEP 4/1945, Grangemouth Burgh Bill note of meeting, 10th August 1962

²³ NRS SEP 17/73, Comment on 1968 report context page 10, 1968

²⁴ Serge Mallet, "Essays", 41; Hanieh, "Petrochemical Empire", 44–45.

²⁵ NRS SEP 4/1945, Grangemouth Burgh Bill note of meeting, 10th August 1962

²⁶ Hansard, 'Grangemouth Burgh Bill', in *House of Commons Hansard Archives*, vol. 240, 1962, cc58-78, <https://api.parliament.uk/historic-hansard/lords/1962/may/07/grangemouth-burgh-bill-hl>.

²⁷ Shibe, "Moral Economy of Noxious Industry."

1951 to 1966 were years of great prosperity and growth for Grangemouth. The township experienced growth of population and employment, while BP Chemicals saw huge diversification of product and domination of the petrochemical market. These impressive feats saw Grangemouth established as the nation's centre of plastics' production, of the unique, modern materials which would, as Anne expressed in the introduction, "last a lifetime." However, growth failed to bring long-term economic security for the community. With public policy not tailored to alleviation of Grangemouth's distinct toxic political economy, expansion bore the seeds of future fossil fuel dependency as the locality was unable to diversify into alternative industries, particularly labour-intensive alternatives. With Grangemouth Town Council granted limited autonomy, the town's industrial structure narrowed as its economy became dependent on highly polluting infrastructure that swallowed up hundreds of hectares of land. What we see today in Grangemouth is a continuation of these trends, with petrochemical production continuing, bringing social, economic and environmental harm to the township.

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