

KEYNOTE: THE GLOBAL PETROLEUM- SCAPE



"Wildcat well, Beechcraft airplane, and camel," 1946.
Photo courtesy of Robert Yarnall
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KEYNOTE: THE GLOBAL PETROLEUMSCAPE¹

Abstract

Corporate and public actors have built the physical and financial flows of petroleum into the very landscape. This brief introduction contains abstracts from longer articles and highlights a few elements of the spatial impact of petroleum flows—physical, represented, and everyday practices—that combine into a palimpsestic global petroleumscape. Through examples from the Middle East, it shows that these layers have become essential parts of modern society and of citizens' everyday lives. It argues that the petroleumscape connects and integrates spatial elements from global to local scales and from different political and economic systems. The Suez Canal, and the construction of the cities alongside it, is a key example for the ways in which petroleum has induced geopolitical transformations. The construction of the city of Abadan exemplifies the grasp of oil on urban planning. Refineries or port installations continue to function as a result of path dependencies and a petroleum-based energy culture, demonstrating how the existence of oil installation reshapes global flows. Buildings and urban forms needed for physical and financial oil flows—including recent developments in Dubai or Saudi Arabia—celebrate oil as a heroic cultural agent, creating a feedback loop that leads societies to consume more oil. Shifting petroleum interests leaves spaces that will require redevelopment and transformation, calling for careful reflection on their future use and role in local history, on democratic intervention, and public input. Only in appreciating the power and extent of oil can we engage with the complex, emerging challenges of sustainable design, policy making, heritage, and future built environments beyond oil.

Author

Carola Hein, Dr.-Ing.
*Professor and Head of the History
of Architecture and Urban Planning,
TU Delft*

Oil has been a critical agent in shaping global geographies—urban, rural, and maritime—through physical infrastructure at major production sites, along networks of consumption, and through intangible, international flows of the finances, people, and ideas that sustain it. Throughout the twentieth century, as oil developed into the single most dominant natural resource, oil companies and states sought to assure its transportation from the production site to the refinery and, ultimately, to the consumer. From oil towns and transportation structures to oil headquarters and retail spaces, public and private oil companies intervene in architectural and urban design, spurring architects and artists to develop visionary buildings and new urban forms. The growing demand for oil in everyday life—initially for lamps and later as fuel for cars and ships—helped spread the global geography of oil.

Together, the physical, represented, and everyday practices form what I call the *global palimpsestic petroleumscape* (figure 1).² The concept of the petroleumscape starts with the insight that the diverse **spatial** emanations of oil—including refineries and storage sites, office buildings, and gas stations—are connected through their relation to this single commodity and its group of industrial players. Connecting the actual places where oil has a hold with the **representation** of these spaces and of the **practices** of petroleum products, our analysis points to a better understanding of the ways in which oil shapes behaviors and secures continuous production and expansion of its spaces, thus creating a feedback loop.

The development of petroleum-based technologies and infrastructures has produced significant changes in the built environment; however, comprehensive research on the impact of oil on the built environment is surprisingly limited, despite oil's ubiquity in everyday life.³ This brief introduction contains abstracts from longer articles and highlights a few elements of the global petroleumscape with a focus on the Middle East.

Extensive and rapid boom-and-bust cycles of activity and construction have transformed oil areas around the world. Because petroleum production sites were located far from sites of consumption, major American and European oil companies, as well as governments, expanded their distribution networks, built new shipping fleets, and established ports in Indonesia, Russia, the Middle East, and South America. Over the last century and a half, port cities have emerged as the quintessential petroleumscape, where the physical presence of oil infrastructure—storage tanks, pipelines, shipping facilities—overlaps with oil-related administrative and cultural functions.

The history of Royal Dutch Shell illustrates the extent of the corporate networks that linked disparate oil regions of the world, and the Suez Canal was a major lynch pin. For safety reasons, the Suez Canal Company had forbidden the shipping of oil through the canal. In 1892, the future Shell company, then run by the Samuel brothers of London, commissioned the SS Murex, to carry Black Sea oil from Batum through the Canal to Bangkok—a quicker and cheaper connection between Russian oil and Asian clients than traveling around

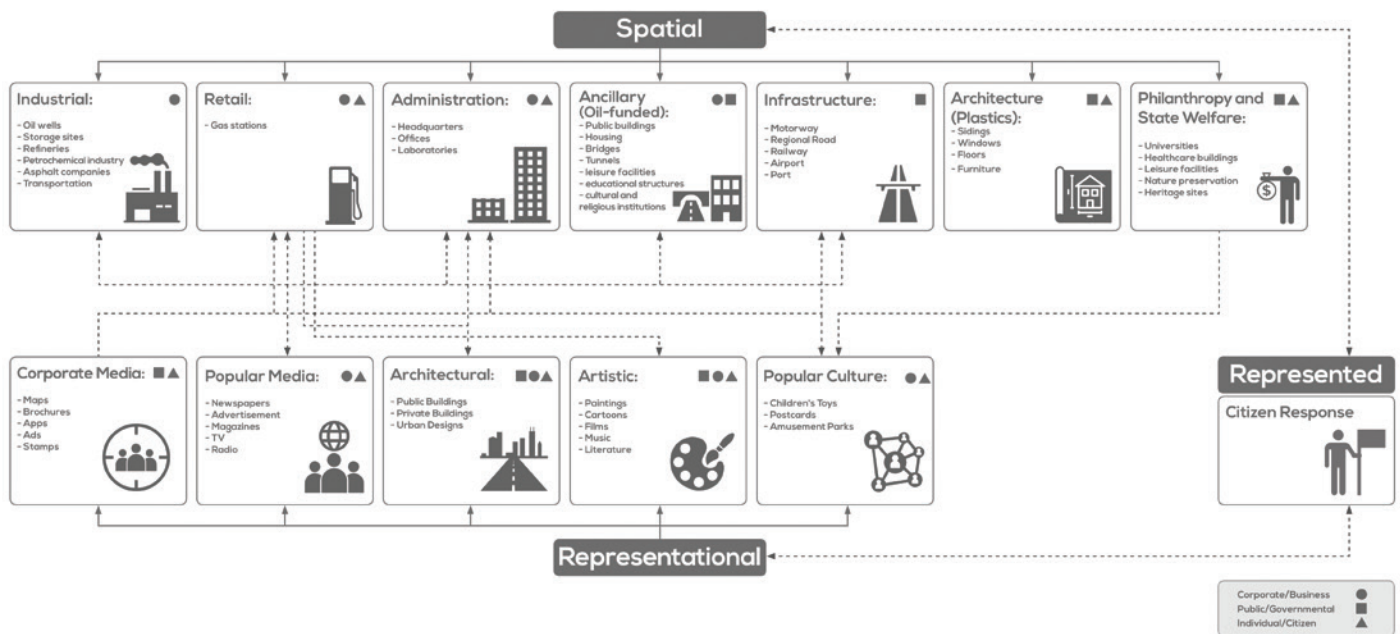


Figure 1: Shows the hybrid, multiple, shifting, and uneven ways in which many actors collaborate to create the global petroleumscape. (Source: Carola Hein.)

Notes

1. This article is based on extracts of: Hein, 2011, 2013, 2016, 2017, 2018.
2. Carola Hein, "Analyzing the Palimpsestic Petroleumscape of Rotterdam," *Global Urban History Blog* (2016); "Port Cities: Nodes in the Global Petroleumscape Between

Sea and Land," *Technosphere Magazine* (2017); "Between Oil and Water. The Logistical Petroleumscape," in *The Petropolis of Tomorrow*, ed. Neeraj Bhatia and Mary Casper (New York: Actar / Architecture at Rice, 2013); "Global Landscapes of Oil," *New Geographies* 2 (2009).

3. Carola Hein, ed., *Oil Spaces: Exploring the Global Petroleumscape*, (Routledge, forthcoming).

the Cape of Good Hope.⁴ Bnito Oil (the Rothschild's oil company) agreed that the Samuel brothers would be its sole distributor of bulk oil east of the Suez, and so they set up the necessary tanks and installations in fourteen ports from the Bay of Bengal to Japan.

In 1907, the Shell Transport and Trading Company united with the Royal Dutch Petroleum Company to create Royal Dutch Shell, combining Dutch interests in Sumatran petroleum with the capacities of a British trading company headquartered in London and working in Russia and Asia (figure 2).⁵ The Suez Canal remained a major transit point for the new company, which owned thirty-eight petroleum tankers at the time of the merger. Beyond the identification of new global transportation routes, the process of oil prospecting underscored development in oil-rich regions. Shell joined British Petroleum (BP) to form Anglo-Egyptian Oilfields Ltd. to extract Egyptian oil in 1911.⁶

Early on, the Shell Transport and Trading Company had rightly understood petroleum as not only a good to be transported, but also a fuel that might replace coal. The company therefore bought land in Suez to provide for the construction of related facilities. The

company also built the first refinery in the Middle East, the Nasr Refinery, in Suez in 1913 (figure 3).⁷ The presence of oil in the location of such a key infrastructure far away from the British heartland increased the desire of the British government to better control the oil-rich region in support of oil corporations. This was even more important as the British government decided to convert its entire fleet to petroleum transportation vessels the same year, further enhancing the importance of the region.

The rising strategic importance of oil for the military in World War I constituted a turning point concerning the ownership of oil, when the military became not just an oil enforcer. As the military progressively depended on gasoline for its ships, tanks, trucks, and cars, European nations expanded their domains and military presence into oil-rich territories. Oil companies and their national governments closely collaborated in their home countries and colonial settings. For example, the British government supported the Anglo-Persian Oil Company, the predecessor of British Petroleum (BP), in drilling in Iran shortly before World War I. Along with the necessary technologies

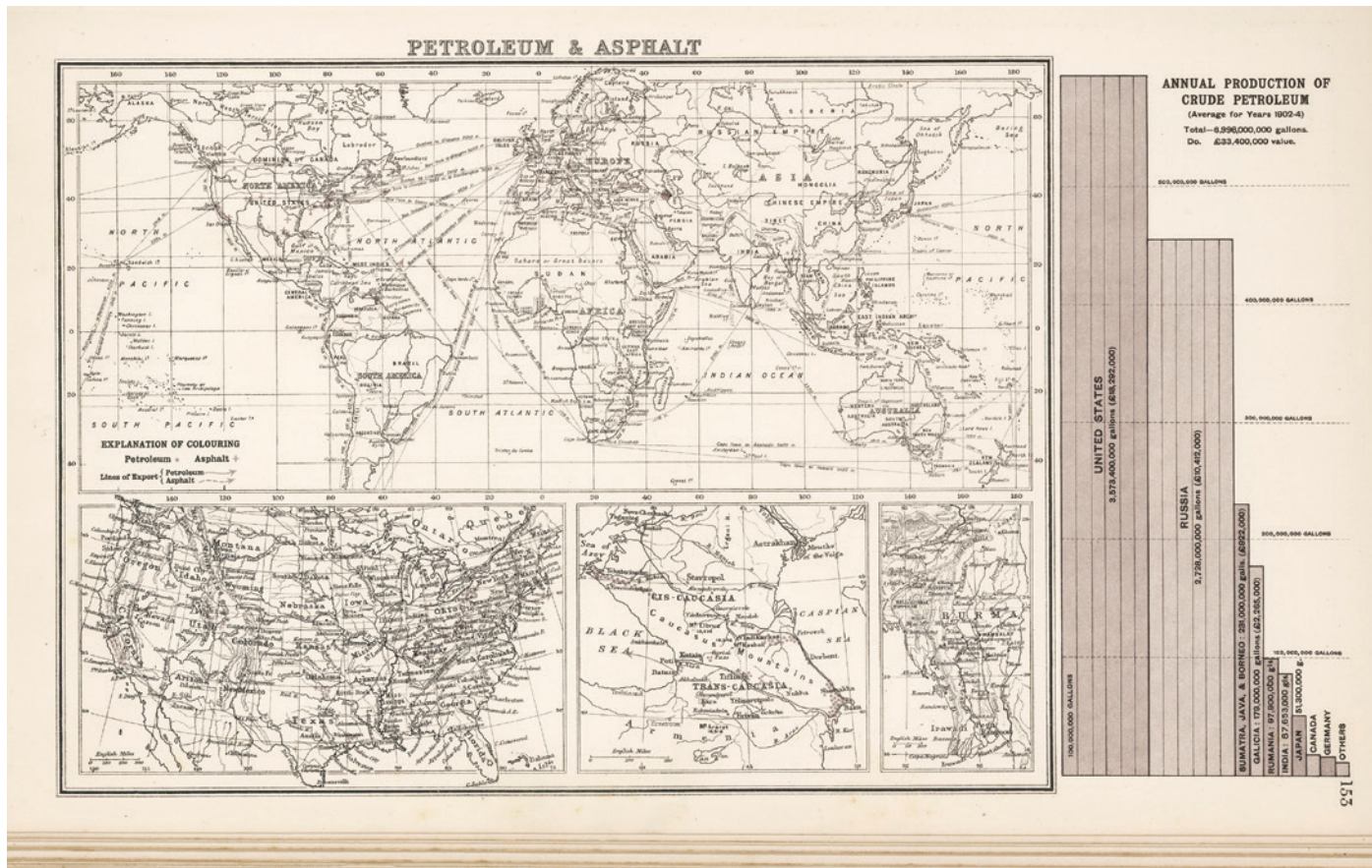


Figure 2: Map and Statistics of Flows and Production of Petroleum and Asphalt. (Source: Bartholomew, J.G. Statistical Atlas 1907.)

4. Stephen Howarth, Joost Jonker, Keetie Sluyterman, and Jan Luiten Van Zanden, *A History of Royal Dutch Shell* (Amsterdam: Oxford University Press, 2007).

5. Howarth et al., *A History of Royal Dutch Shell*.

6. On petroleum prospection and extraction in Egypt, see: J. S. Royds, J. F. Mason, and D. B. Eicher, "Africa: Chapter 22: Part I. Egypt," *AAPG Special Volumes* 24, no. 8 (1975): 1419-1436. The British decision to invest in the canal may have

been inspired by the discovery of the Gemsa oil field, as cited by Rami A. Kamal, "Overview of the Petroleum Industry in the Middle East (1869-1950)," *The Leading Edge* 24, no. 8 (August 2005): 818-822. According to the website of Shell Egypt, the ownership ratio between Shell and BP was fifty-fifty in 1911: "Shell History," *Shell Egypt*

NV, accessed June 19, 2012, www.oilegypt.com/webpro1/oil/oilegypt/shell/history.asp. In 1937, when the Anglo-Egyptian Oilfields Company discovered the oil field of Ras Gharib, Shell owned 32.2% of the company, according to Stephen Howarth et al., *A History of Royal Dutch Shell*, 37.

for exploiting the petroleum, oil companies brought into their countries of operation architectural and urban concepts such as the garden city, implemented to address social and ethnic anxieties by setting up housing districts that separated expatriates from local workers. The design for Abadan, a company town built under the Anglo-Persian Oil Company between 1910 and 1951, highlights how such colonial social structure is inscribed into urban form by combining spacious compounds for British expatriate workers with barrack-like huts for locally recruited workers, as well as a locally administered town for nationals (figure 4).⁸ Such an example of company involvement in the overall design of a town appears to be a rarity, though a comprehensive plan, in conjunction with local interests, has the potential to provide better infrastructure, housing, leisure, and other facilities for local populations and create long-term settlements for oil workers.

As oil became more important to national interests, many oil-rich countries nationalized oil reserves and foreign-owned infrastructures, including refineries, at times using the new wealth to create new

infrastructures, including new capital cities. As former colonial powers had to leave, oil companies rebuilt refineries in their home countries and remained involved, where possible, in the postcolonial oil business. The entanglement of global oil companies in postcolonial oil exploration and the development of new urban structures—including new ports in exporting countries—is illustrated in the case of Nigeria. Royal Dutch Shell (as Shell D'Arcy) discovered oil at Oloibiri in 1956, and Nigerian crude oil was exported from Port Harcourt after 1958.⁹ The petroleum industry sparked urban development in Port Harcourt and the conception and construction of the new capital city, Abuja, in the center of the country, as well as the growth of the port of Lagos, through which consumer goods and raw materials entered the country.¹⁰ The impact of petroleum explorations thus extends beyond production sites to locations of administration as well as to places of new development and investment of oil funds, provoking an urbanism fueled by oil.

Infrastructure and oil-related facilities have been primarily built by private companies in the service of their corporate interests and not in connection with larger

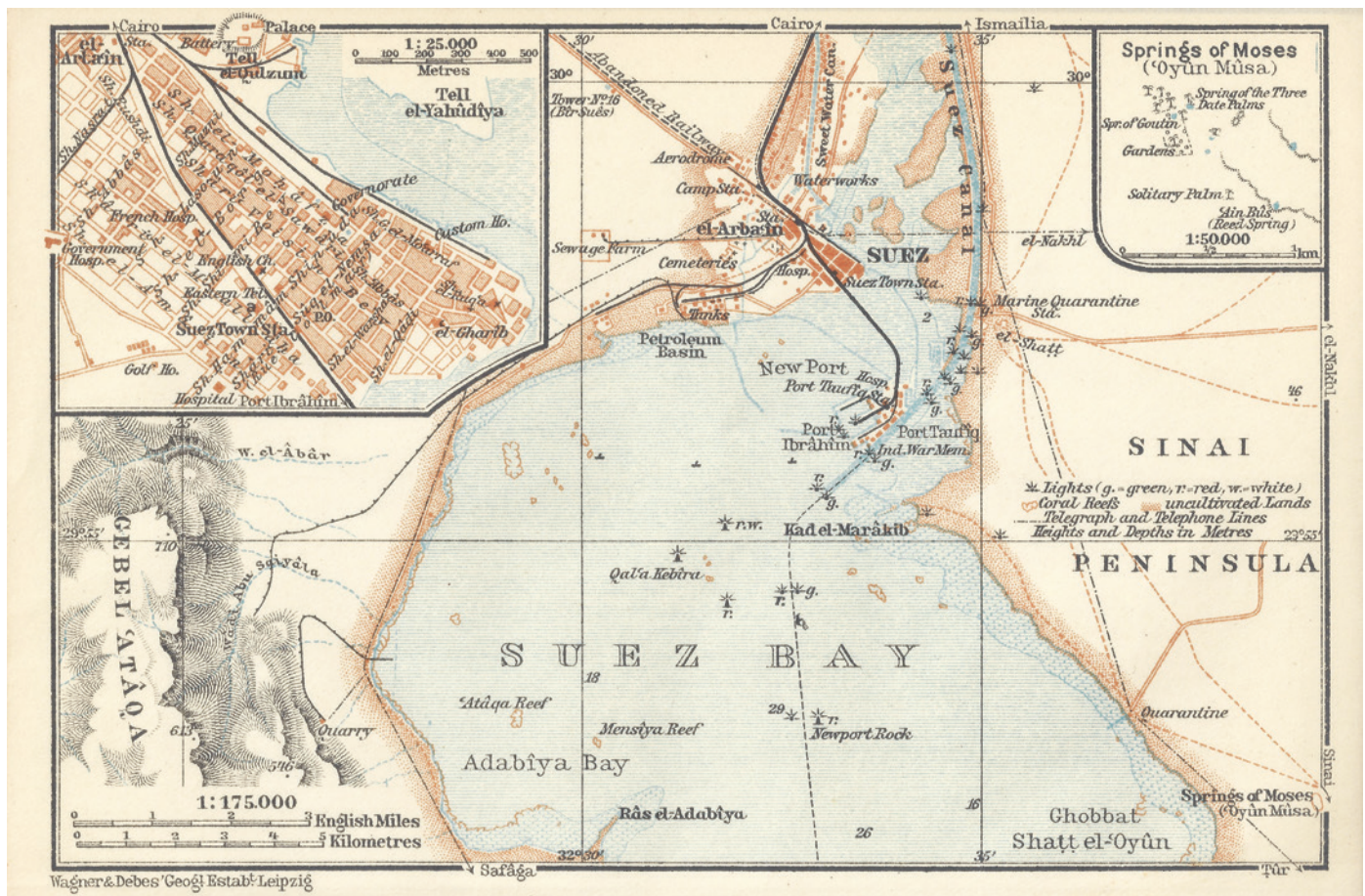


Figure 3: Location of the refinery in Suez.
(Source: Baedeker, K. [1929]. Baedeker's Egypt, Egypt and the Sudan, Baedeker.)

7. Ibid.; Kamal, "Overview of the Petroleum Industry in the Middle East (1869–1950)," 818–822.

8. Hein, C., and M. Sedighi, "Iran's Global Petroleumscape: The Role of Oil in Shaping Khuzestan and Tehran," *Architecture Theory Review* 21, no. 3 (2017).

9. On Nigeria, see also: Kairn A. Klieman, "U.S. Oil Companies, the Nigerian Civil War, and the Origins of Opacity in the Nigerian Oil Industry," *Journal of American History* 99 (2012): 155–165.

10. Dan Shneerson, "Investment in Port Systems: A Case Study of the Nigerian Ports," *Journal of Transport Economics and Policy* 15 (1981): 201–216.

ABADAN—THE FRUIT OF BRITISH INDUSTRY THAT PERSIA COVETS.



ABADAN FROM THE AIR, LOOKING NORTH-WESTWARDS. THE SHATT EL ARAB AND ITS JETTIES LIE TO THE LEFT, THE FOREGROUND BEING DOMINATED BY THE ANGLO-IRANIAN OIL CO.'S BAWARDA HOUSING ESTATE. THE TOWERS AND CHIMNEYS OF THE REFINERY RISE IN THE RIGHT BACKGROUND.

Abadan, the world's greatest oil refinery and the plum which the Persians are expecting to fall into their hands, is a monument of British private enterprise and industry. In 1929 it was not even marked on the latest maps of the Persian Gulf. It is now a city of 40,000 inhabitants, the centre of which is the huge refinery plant of the Anglo-Iranian Oil Co., built to handle the oil from the Persian oilfields. Not only has the company supplied the *raison d'être* for the town, it has also built the majority of it, together with such important amenities as hospitals, schools, technical colleges, clubs, sports grounds and cinema. The

two aerial views reproduced on this and the facing page are taken from different angles and are complementary. The town fronts on to the Shatt el Arab River, whose other bank is in Iraq. The refinery area stretches from the jetties on the river frontage, between two creeks, which run beside storage yards; and in this section also lie a native non-company area and, on the other side of the plant, an area of British and Persian bachelor quarters. South of this section lies the Company's Bawarda area, a large estate of British and Persian family houses for staff. In this area can be seen a swimming pool and tennis courts.

Figure 4: Aerial view of Abadan, a city built around a refinery in 1951, when the Iranian government nationalized the Anglo-Iranian Oil Company. (Source: *The Illustrated London News*, London, September 8, 1951.)

THE WORLD'S GREATEST OIL REFINERY—DEADLOCKED ABADAN, FROM THE AIR.



ABADAN FROM THE AIR, LOOKING EASTWARDS: THE REFINERY SECTION LIES ACROSS THE CENTRE BACKGROUND, WITH FAMILY AND BACHELOR QUARTERS IN FRONT. THE BRAIM CREEK, IN THE FOREGROUND, LEADS TO THE SHATT EL ARAB, ON THE RIGHT, AND RUNS BESIDE STORE YARDS.

At the date of writing the Anglo-Persian oil crisis appeared to be in a state of immovable deadlock. On August 30 Dr. Grady, the U.S. Ambassador to Persia, saw Dr. Moussadek and learnt that he had no suggestions to offer and appeared to be expecting suggestions from the British Government. Mr. Stokes, however, and Mr. Harriman, President Truman's personal representative, have already indicated that the next move for any resumption of the negotiations must come from the Persians; and it is believed that a policy of allowing the Persians "to stew in their own oil" is being followed. In the meanwhile, general sympathy

is felt for the British employees of the Anglo-Iranian Oil Co., who are still in the country. At Abadan, for example, where the great finished-product tanks are full and the world's greatest oil refinery continues at a standstill, some 513 British employees still remain (though this figure will shortly be reduced to 300-350), keeping the idle plant on a care-and-maintenance basis, alone, in a hostile town, subject to incessant pinpricks from the Persian authorities, in the hottest season of the year and with their families evacuated overseas. The normal establishment figure for British staff of the company in Abadan is about 1700.

regional or urban plans. Even under colonialism or state ownership, comprehensive planning approaches have been rare. Petroleum interests paid little attention to the potentially supplemental or future uses of these projects, including better public infrastructure, housing, leisure, and long-term settlements for local populations beyond oil workers. While the global petroleumscape is formed in service of oil, the framework it produces is often colonized by a second production of urbanism that could more holistically be designed in its initial conception.

Oil money financed urban transformations and the construction of new cities around the world. While some of these developments are the result of individual private investments, others, notably in countries where oil production is administered by the national government, are the outcome of large-scale planning. Several oil-producing regions and countries since the 1970s have used their petroleum-generated income to design their capitals, such as Alaska, as well as national capitals, such as Abuja in Nigeria and Dodoma in Tanzania, also Riyadh and many Gulf cities.

Jebel Ali in Dubai, provides another example of a port city built in the context of oil, which the Sheikh built to compete with a neighboring emirate and to secure oil profits. He used foreign ideas and consultants for engineering, planning, and architecture (including concepts for company towns) to reinvent and reimagine the port city at an unprecedented new scale.¹¹ As the architectural historian Stephen Ramos has pointed out, the city is not a hodgepodge of different ideas, but rather a very carefully composed development.¹² Public entities and private oil interests have the capital and the resources—but not necessarily the incentives—to contribute positively to the process of planning the petroleumscape. The opportunities to do so continue to increase as intercontinental oil transport impacts more of the globe via logistical waterways.

The critical role of shipping and ports in global petroleum commerce will likely continue into the future. Cross-oceanic transport of petroleum continues to occur primarily via ships. Even pipelines—considered an alternative to shipping—are often linked to ports. To reduce dependence on OPEC oil and to bypass Russia, several petro-actors, including the United States, various European companies, and Azerbaijan's state oil company formed the Baku-Tbilisi-Ceyhan (BTC) Pipeline Company in 2002, in order to transport Caspian oil to the Turkish Mediterranean port of Ceyhan. From there, ships will transport the oil to consumers internationally. The interface between hard infrastructure (pipelines) and soft infrastructure (mobile logistical routes) creates critical nodes in the petroleumscape that are directly or indirectly tied to oil.

Numerous countries have already begun using oil money to build postoil cities. The annual revenue from oil and gas (\$325 billion in 2006) affords Persian Gulf countries a financial foundation from which to reform their local economies, rebuild cities, and invent new urban futures.¹³ Virtual networks of oil are inscribed in these developments, whose new waterfronts focus on upscale housing, tourism, culture, and leisure activities and are being built on reclaimed land in Dubai, Abu Dhabi, Qatar, and Manama. The region attempts to diversify economically and establish itself as a leader in energy preservation and waste reduction. It also has plans to prove its commitment to sustainable development through projects such as Masdar City.

Not yet as widely published as the projects in Dubai and Abu Dhabi, but potentially more impressive, are the recent megaprojects in Saudi Arabia. There, the world's single largest supplier of oil plans to use oil profits to diversify the economy, create jobs, attract foreign investment, and balance regional development.¹⁴ The kingdom, which obtains eighty percent of its revenue from oil, is engaged in 420 major projects, including six economic cities worth over \$283 billion and covering 430 million square miles. The projects will be realized between 2006 and 2025, each city designed to maximize regional strengths and host various cultural activities. One of these, the King Abdullah Economic City will include a seaport, an industrial district, a financial center, a residential zone with 150,000 apartments, and educational development for 15,000 students (figure 5).¹⁵ These new petropolises are diversifying their programs to conceive of an urbanism that extends beyond the life of oil.

Much of the early infrastructure and many of the installations for oil extraction in Europe and the Americas have already become obsolete and are ripe for redevelopment. The plans to do this often inscribe the historic role of oil urbanism into postoil waterfronts. BP Park in Sydney, for example, is a large urban park built on the site of the massive storage tanks that were built in the 1920s to transfer fuel from inbound ships to motor tankers (figure 6).¹⁶ Even some of the gigantic rigs in the Mexican Gulf and the North Sea have already been reenvisioned as hotels, wind farms, and reefs.

Whether converted into museums, tourist attractions, or public parks, such former petroleum sites stand as memorials to the industry, its artifacts, and its technologies. Sites that resulted from the early petroleum revolution, such as Newtown Creek in Brooklyn, where oil spills recurred over many years, have seen cleanup and, eventually, rebuilding. Other sites, such as the lower Philadelphia waterfront and its centenary oil installations, are only now finding their way back to the drawing board. Several of these former petroleum

11. Stephen J. Ramos, "Dubai's Jebel Ali Port. Trade, Territory and Infrastructure," in *Port Cities: Dynamic Landscapes and Global Networks*, ed. Carola Hein (London: Routledge, 2011).

12. Ramos, "Dubai's Jebel Ali Port. Trade, Territory and Infrastructure."

13. Kito De Boer and John M. Turner, "Beyond Oil: Reappraising the Gulf States," *The McKinsey Quarterly* (January 2007), accessed July 16, 2012, www.mckinseyquarterly.com/Beyond_oil_Reappraising_the_Gulf_States_1902.

14. On King Abdullah City, see: Emaar, "King Abdullah Economic City: Opportunities for all in the City of the Future," www.kaec.net.

scapes have an embedded framework of urbanism that emerged from the logistics of oil and yet still persist today.

The confluence of politics, economics, and geography produces nodes in the petroleumscape that are often far from the sites of oil extraction or consumption. National and corporate interests in oil extraction have been critical in creating and implementing new petroleum networks, new ports, and petroleum-related facilities around the world. Furthermore, they have determined the location of housing, leisure, and administrative facilities. Oil infrastructure—and its related storage tanks, refineries, and pipelines—occupies prominent space in harbors around the world. In both growth and decline, changes to petroleum activities and requirements, and by extension, the ports that serve them, have had major impacts on cities, from the utilization of the waterfront to the construction of infrastructure, company headquarters, and housing facilities.

Some of this infrastructure, such as railways and roadways, survives and shapes later user patterns; others, such as shipping networks, disappear with little trace. Some of the abandoned areas can be reused for other activities, often liberating centrally located city spaces. In all of its manifestations, oil redevelopment will underscore the pervasive quality of the petroleumscape. Port cities—as key nodes in a logistical network—are a critical interface for future notions of design. The current conflict in the Strait of Hormuz demonstrates its continued importance.

Petroleum interests are again shifting the locations of their infrastructure, leaving spaces that will require redevelopment and entering new areas that will be forever transformed. Exploration and production facilities move farther out to sea, creating yet another dimension in the relationship between water and oil. These transformations present new opportunities for comprehensive planning and warrant careful consideration of environmental impacts. Most of the new exploitation will be executed by private companies—some connected with national governments. As we become more aware of the ways in which oil logistics produce spatial templates, which linger beyond their function for oil extraction and are most evident in port cities, the planning of such logistics requires greater consideration. It remains to be seen whether the corporate and governmental players that control oil can design the coastal city in anticipation of broader cultural needs and uses without democratic intervention or public input.



Figure 5: The waterfront of the King Abdullah Economic City (KAEC) as of October 2016. (Source: https://fi.wikipedia.org/wiki/King_Abdullah_Economic_City#/media/Tiedosto:Waterfront_King_Abdullah_Economic_City.jpg.)



Figure 6: BP Park in Sydney. (Source: Jason Wong, Flickr.)

15. Saudi Arabian General Investment Authority, "Key Sectors," accessed July 16, 2012, <http://sagia.gov.sa/english/index.php>.

16. Michael Garbutt, "Sydney: A Park with a View," *Topos: European Landscape Magazine* 52 (2005): 23–28.