Chapter 13
Petroleum Supply Chain Network Design:
A Case Analysis from Oman

Avninder Gill
Thompson Rivers University, Canada

EXECUTIVE SUMMARY

Product distribution represents a significant portion of logistics costs. A well designed distribution network may provide substantial long-term benefits, but as the infrastructure develops, the optimal strategy may not be taken for granted. Product distribution costs are dependent on the supply chain network design, and the issue assumes more importance in emerging economies. When the emerging economies mature with time, both the supply as well as demand points shift, thus making it necessary to re-visit the network design problem in the future. This case analyses the supply chain retail network design of a company that distributes petroleum products throughout the Sultanate of Oman. The network design strategy employs an optimization model to identify the depot locations and gas station allocations in its distribution network. The case leads to identify the petroleum depot locations and gas station allocations and allows for designing an efficient distribution system. Additionally, the case study provides an opportunity to explore the major challenges faced by the petroleum supply chains in emerging economies. These challenges include changed business scenarios due to the diversification agenda of these economies, memberships in trade organizations and bilateral agreements, emergence of additional competition, lowering or elimination of tariffs, less protectionism of the local companies, and other risks associated with the supply chains.

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INTRODUCTION AND CASE CONTEXT

Sultanate of Oman is a beautiful country located on the south-eastern tip of the Arabian Peninsula, occupying an area of 309,500 square kilometres and a population of approximately 2,612,400 that includes about 666,000 expatriates. The expatriate population comes mainly from India, Pakistan, Sri Lanka, Bangladesh, Iran, Egypt, Lebanon, East Africa and some Western countries. Population density is only about 10 people per square kilometre. Most of the population base is around the capital area of Muscat and the southern city of Salalah. The urban population accounts for approximately 79% of the total population. Oman also has a predominant youth population with 96% of the people below 60 years of age. The literacy rate is 82% for men and 64% for women. Oman has a tropical climate with strong oceanic influences on coastal lands and monsoons in the southern regions. It is mostly hot and dry with average temperatures varying between 15°C in winter and 50°C in summer. The country has a very rich cultural heritage, strongly influenced by marine and desert culture, the Islamic way of life and a good Ethnic mix that forms a part of the Omani culture today. Before 1970, Omani culture was largely isolated but in the post-1970 era, under the guidance of His majesty Sultan Bin Said Qaboos, the country embarked on major modernization initiatives and has opened up to the world. Today, Oman has built a reputation for being a peaceful nation, which shows adequate loyalty to other Arab nations but at the same time maintains very close ties with most Western countries, especially the UK.

Oman is surrounded by ocean on two sides: the Gulf of Oman in the northeast, the Arabic sea in the east and the Indian Ocean in the southeast. It shares borders with Saudi Arabia in the west, Yemen in the south and the United Arab Emirates in the north. The diverse Omani geography contains stony plains, deserts, sand dunes, pristine coastlines as well as mountainous uplands. The Sultanate of Oman commands a coastline stretching for about 3,165 kilometres from the farthest point of the southeast on the Arabian Sea and the mouth of the Indian Ocean, to Musandam in the north. The coastline also overlooks the strategic Strait of Hormuz at the point of entry to the Arabian Gulf. This straight is considered to be strategically important for Oman as it provides a shipping gateway to all the ships coming from the Indian Ocean and the Arabian Sea, and has an important impact on international trade. Oman has two international airports and four domestic airports. Currently, the country has no railway tracks. Once with only 10 kilometres of paved roads in 1970, Oman today boasts of over 33,000 kilometres of road network, of which more than 30% is paved. This is no minor accomplishment for a nation that, under the leadership of a visionary leader, achieved it in 40 odd years. The current network connects most of the Omani cities and districts (Wilayats) through major highways and link roads, and provides important infrastructure for the economic growth of the country.