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Sustainable Capital Investment at Port de Barcelona

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Abstract. Ports worldwide face the dual challenge of investing in infrastructure to meet growing demand while advancing sustainability goals. This teaching case examines the multifaceted challenges the Port of Barcelona confronted when evaluating a 25-year concession proposal for a new cruise terminal. Students assume the role of port executives tasked with determining the concession's annual fee, navigating the balance between financial viability and the port's decarbonization goals. The case offers a rich context for applying capital investment analysis, including Net Present Value (NPV) calculation, relevant cash flow identification, and forecasting under uncertainty, while distinctively tasking students with calculating the required revenue stream to achieve a target NPV of zero. Crucially, the case integrates sustainability by examining the financial implications of carbon emissions and the utilization of voluntary carbon credits. The case is designed to foster critical discussion on aligning business strategy with sustainability. The case is ideal for courses in sustainable finance, responsible management, and environmental economics.

Keywords: capital investment, NPV, carbon credits, greenhouse gas emissions, sustainability, port management.

In late summer 2024, Marta Garbí, President of the Barcelona Port Authority, met with CFO Joan Mestral to discuss the appropriate fee for a 25-year concession to a private operator. The concession would grant the operator use of idle space in the Terminals Dock for the construction and operation of a new cruise ship terminal. This project was aimed at addressing the growing demand for cruise ship berths. Because the fee would be contractually fixed for the entire concession period, establishing an appropriate annual fee would have significant long-term consequences. President Garbí was also concerned about the project's potential impact on the Port's transition to a decarbonized energy model. She sought to understand how the Port's decarbonization objectives could be integrated into the project's financial analysis.

1. Port of Barcelona

The Port of Barcelona is a leading maritime hub in Spain and Europe, serving as Catalonia's main transport and services infrastructure. Located on the Mediterranean coast, it's a significant player in global shipping, handling 3.3 million TEUs[1] in 2023, making it Spain's third-largest container port and Europe's ninth largest. The port's extensive 22.4 km berthing line spans an area of over 1,100 hectares.

The port handles diverse cargo, including containers, vehicles, and bulk goods. In 2023, it processed approximately 64 million tons of cargo and 790,000 vehicles. It's also a major passenger port, serving 3.6 million cruise passengers and 1.7 million regular line passengers in 2023. Its strategic location connects it to 200 ports globally through 100 regular transport lines, making it a crucial gateway for the Iberian Peninsula and Southern Europe.

Illustration 1. Aerial view of port and city of Barcelona

Source: Google Earth Pro

The Port of Barcelona is a prominent cruise industry leader, ranking as the largest Mediterranean port for cruise ship traffic and fourth globally (after Caribbean ports). It serves as a home port for many Mediterranean cruise ships, including some of the world's largest. The port currently operates nine passenger terminals, six dedicated to international cruise ships. The proposed Terminal K would become the seventh international and tenth overall passenger terminal, expected to open in January 2027.

1. TEU (Twenty-foot Equivalent Unit) is a standard unit of measurement for cargo capacity on container ships and terminals, derived from the dimensions of a 20-foot shipping container. This unit clarifies capacity regardless of whether containers are 20 or 40 feet long.