

The environmental costs and economic implications of container shipping on the Northern Sea Route

Abstract

The Northern Sea Route (NSR) has tremendous potential for ocean shipping between Europe and Asia due to the savings from shorter transit time and distance. However, the Arctic area is environmentally vulnerable and thus there is a trade-off between NSR's impacts on environment vs. its economic benefits, especially when compared with the traditional route, such as through the Suez Canal Route (SCR). This study estimates the market shares of different transport modes and alternative shipping routes for the container transport market between Europe and Asia, and the resulting environmental costs. Our result suggests that NSR can be a viable option under the status quo. However, its environmental costs tend to be higher than SCR due to small ship size and low load factor in the present, thus the development of NSR would lead to worse environment outcomes. If these issues can be resolved, NSR can benefit from lower operational and environmental costs, which will lead to higher market share and social welfare. Otherwise, increased use of NSR may lead to higher total environment costs than the status quo.