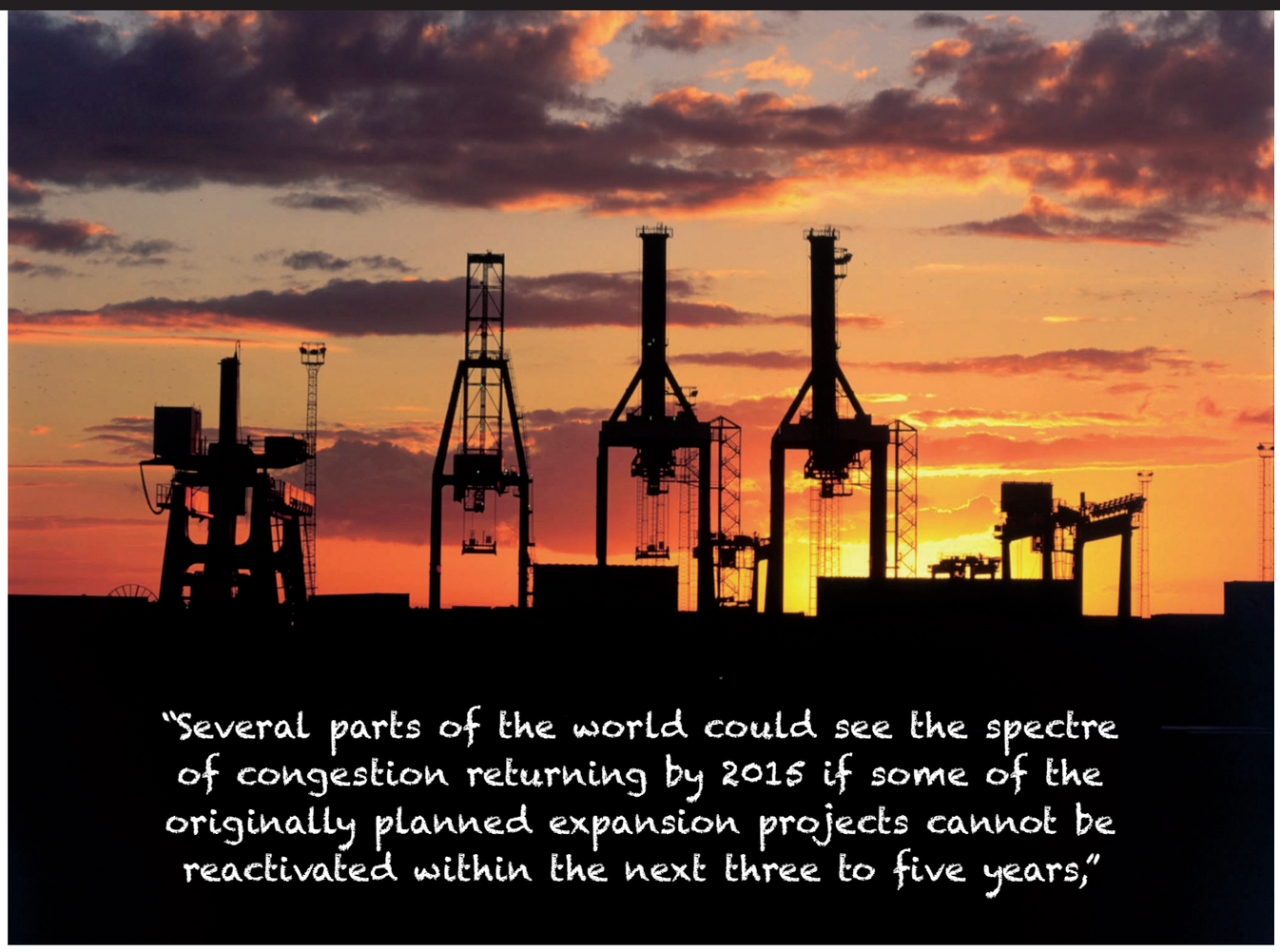

Spanish organisations: Valenciaport Foundation; China Shipping (Spain Agency); Ingenieria de Sistemas para la Defensa de España; Spanish Depot Service and Trans-Base Soler.

Faced with the problem of analysing, understanding and improving the flow of containers though a terminal, the Flagship-RTS team worked closely with the port of Valencia in order to develop a solution based on real world data that was applicable to any container terminal. Initial analysis indicated that the problem involved three key interlinking areas.

Within the terminal itself, the combination of ships loading and unloading (including transhipments and feeder vessel movements) with trucks picking up or dropping off containers creates intense activity all centred on a limited area. Congestion is a major problem within many container terminals, and the need to minimise the turnround time for the ship only exacerbates this. Deadlines for arrival are driven by ship docking times so there is naturally a lot of activity with many vehicles trying to get into the same area at the same time.

The land-based part of the operation involves trucks picking up containers from the terminal, taking them inland, dropping off the goods then bringing an empty container back. At the same time there are other trucks going to inland destinations with an empty container, picking up goods for export and again going back in to the terminal to drop the full container off. For a major port there are many carriers with thousands of container movements taking place in a day, so integration of landside and terminal activity presents a highly complex problem.

The third area is the management and positioning of empty containers. Limited space within the confines of the terminal means that empty containers are often stocked in a depot which may be some distance away. However at some point the containers will have to be transported back