During offshore and onshore loading, storage and transportation of crude oil either in on vessels or in oil terminals, crude oil vapors, known as volatile organic compounds (VOCs), are emitted to the atmosphere. The emission can vary between 0.1 kg VOCs per ton of cargo (terminal loading) to 2.8 kg VOCs per ton (offshore loading in bad weather). This will be equal to hundreds of barrels of oil. The emission represents a substantial loss of financial value and destructive consequences to the environment.

The environment impact of these emissions is significant as the emitted gas consists of range of hydrocarbons from methane to higher (typically C6+). Methane is a greenhouse gas with a global warming potential (GWP) of 21 (GWP for CO\textsubscript{2} is 1). The nonmethane fractions, known as NMVOC, in presence of sunlight react with nitrous oxides and create a toxic ground level ozone and smog layer, which has detrimental environmental effects on vegetation and on human health, particularly on eyes and lungs.
The Wärtsilä Hamworthy VOC recovery system captures the harmful VOC emissions during loading of crude oil, and utilizes it as a valuable light fuel for power generation. This is accomplished by sending vent gas into the VOC recovery system, removing the heavier hydrocarbon fractions (mainly C3+) of the gas by a two stage condensation process before the non-condensable hydrocarbons in surplus gas (mainly methane & ethane) is fed to power generating module; this means 100% VOC Recovery and zero VOC emission.

Surplus gas constitutes up to 90% of the energy fed into the power generating module, the rest can be supplied from the liquefied VOC (LVOC) stored in a storage tank. LVOC is a light hydrocarbon fuel which can be applied as clean fuel in power generating modules and inert gas generator units. Wärtsilä Hamworthy VOC recovery system has been successfully utilized on board several shuttle tankers and floating storage units (FSU) in the North Sea.