Carnot Cycle
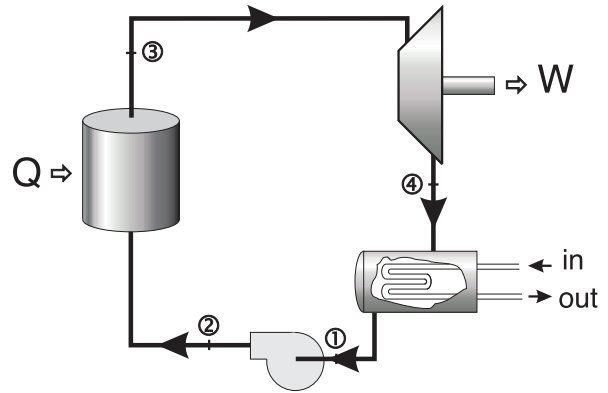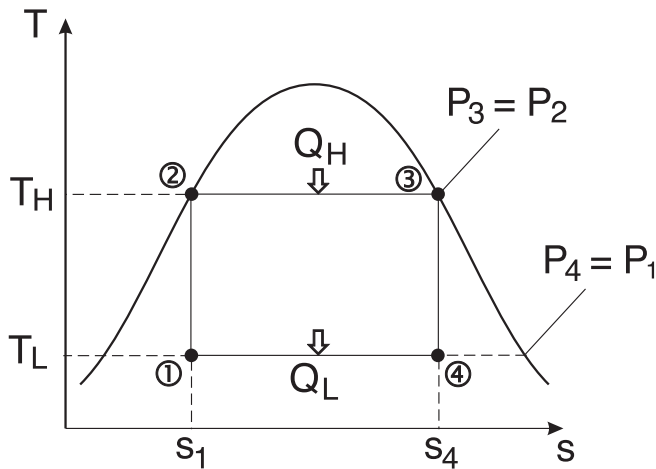
- based on a fully reversible heat engine - it does not include any of the irreversibilities associated with friction, viscous flow, etc.

Process	State Points	Description
Pump	$1 \rightarrow 2$	isentropic compression from $T_L \rightarrow T_H$ to return vapour to a liquid state
Heat Supply	$2 \rightarrow 3$	heat is supplied at constant temperature and pressure
Work Output	$3 \rightarrow 4$	the vapour expands isentropically from the high pressure and temperature to the low pressure
Condenser	$4 \rightarrow 1$	the vapour which is wet at 4 has to be cooled to state point 1

Practical Problems

- at state point 1 the steam is wet at T_L and it is difficult to pump water/steam (two phase) to state point 2

- can we devise a Carnot cycle to operate outside the wet vapour region
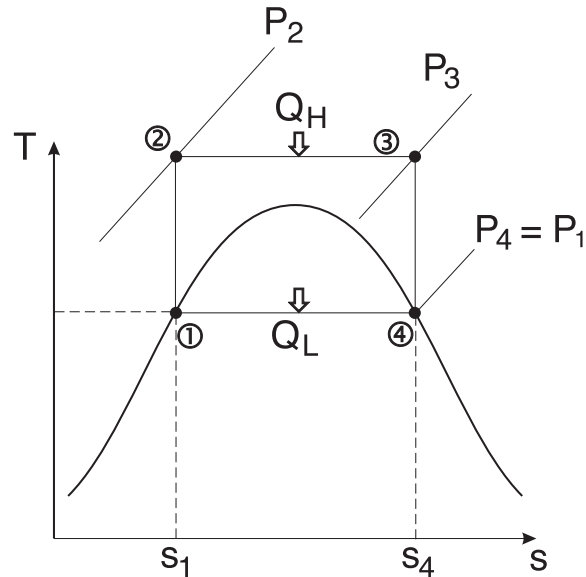
- between state points 2 and 3 the vapour must be isothermal and at different pressures - this is difficult to achieve
- the high temperature and pressure at 2 and 3 present metallurgical limitations

The net effect is that the Carnot cycle is <u>not</u> feasible for steam power plants.