ABSTRACT. We define a stability condition for a polarised algebraic variety and state a conjecture relating this to the existence of a Kahler metric of constant scalar curvature. The main result of the paper goes some way towards verifying this conjecture in the case of toric surfaces. We prove that, under the stability hypothesis, the Mabuchi functional is bounded below on invariant metrics, and that minimising sequences have a certain convergence property. In the reverse direction, we give new examples of polarised surfaces which do not admit metrics of constant scalar curvature. The proofs use a general framework, developed by Guillemin and Abreu, in which invariant Kahler metrics correspond to convex functions on the moment polytope of a toric variety.