ITER and future reactors depend on divertor “detachment,” whether partial, pronounced or complete, to limit heat flux to plasma-facing components and to limit surface erosion due to sputtering. It would be valuable to have a measure of the difficulty of achieving detachment as a function of machine parameters, such as input power, magnetic field, major radius, etc. Frequently the parallel heat flux, estimated typically as proportional to \( P_{\text{sep}}/R_0 \) or \( P_{\text{sep}}B_0/R_0 \), is used as a proxy for this difficulty. Here we argue that impurity cooling is dependent on the upstream density, which itself must be limited by a Greenwald-like scaling. Taking this into account self-consistently, we find the impurity fraction, \( c_z \), required for detachment scales as:

\[
c_z \propto \frac{P_{\text{sep}}}{\langle B_p \rangle^3 (1 + \kappa^2)^{3/2} f_{GW,\text{sep}}^{\ell}} \left( \frac{1 + \bar{Z}}{A} \right)^{1/2}
\]

where \( \ell \) represents enhancement in the divertor connection length due to advanced divertor configurations. The absence of any explicit scaling with machine size is concerning, as \( P_{\text{sep}} \) surely must increase greatly for an economic fusion system, while increases in the other parameters are limited. This result should be challenged by comparison with 2-D codes and measurements on existing experiments. Nonetheless, it suggests that higher magnetic field, stronger shaping, double-null operation, “advanced” divertor configurations, as well as alternate means to handle heat flux such as metallic liquid and/or vapor targets merit greater attention. In particular, lithium appears to be an attractive radiator in this context.