Impact of Dielectric (2)

What happens when a dielectric is placed into a capacitor with the **voltage across the capacitor** kept constant?

	vacuum	dielectric
voltage	V_0	$V = V_0$
electric field	E_0	$E = E_0$
capacitance	$C_0 = \frac{Q_0}{V_0}$	$C = \frac{Q}{V} = \kappa C_0 > C_0$
charge	Q_0	$Q = \kappa Q_0 > Q_0$
potential energy	$U_0 = \frac{1}{2} C_0 V_0^2$	$U = \frac{1}{2} C V^2 = \kappa U_0 > U_0$
energy density	$u_E^{(0)} = \frac{1}{2} \epsilon_0 E_0^2$	$u_E = \frac{1}{2} \epsilon E^2 = \kappa u_E^{(0)} > u_E^{(0)}$