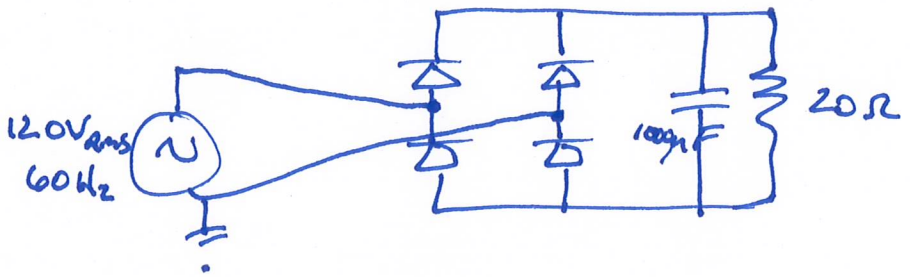
Point of Common Connection & Line Voltage Distortion

We have defined Total Harmonic Distortion, THD, for currents. $THD_i > 0$ is common in circuits with non-linear elements (e.g. diodes, transistors, etc.) they cause the current flowing from an AC power source, such as the grid, to have a non-sinusoidal aspect.

Consider, for example, this 1-phase bridge rectifier w/ capacitor



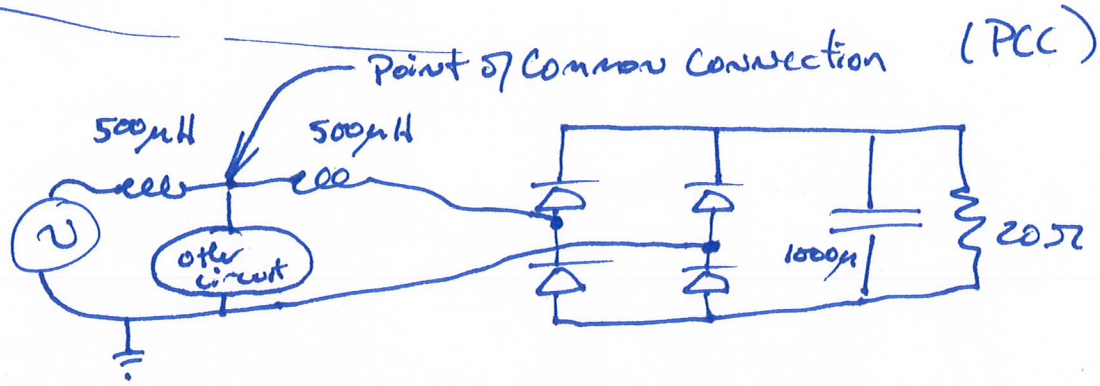
The current is significantly distorted (see presentation today)

w/ $i_{RMS} = 15.28A$, $i_{1,RMS} = 10.08A$

$\longrightarrow THD_{2a} = 114\%$

This distortion of the current away from a sinusoidal wave form can cause the voltage experienced by other circuits to be distorted if there is inductance in the lines (which could be due to transmission wires, transformers, or inductance built into the power converter).

Situation considered



We will observe distortion of the voltage at PCC and measure THD_V at that location.