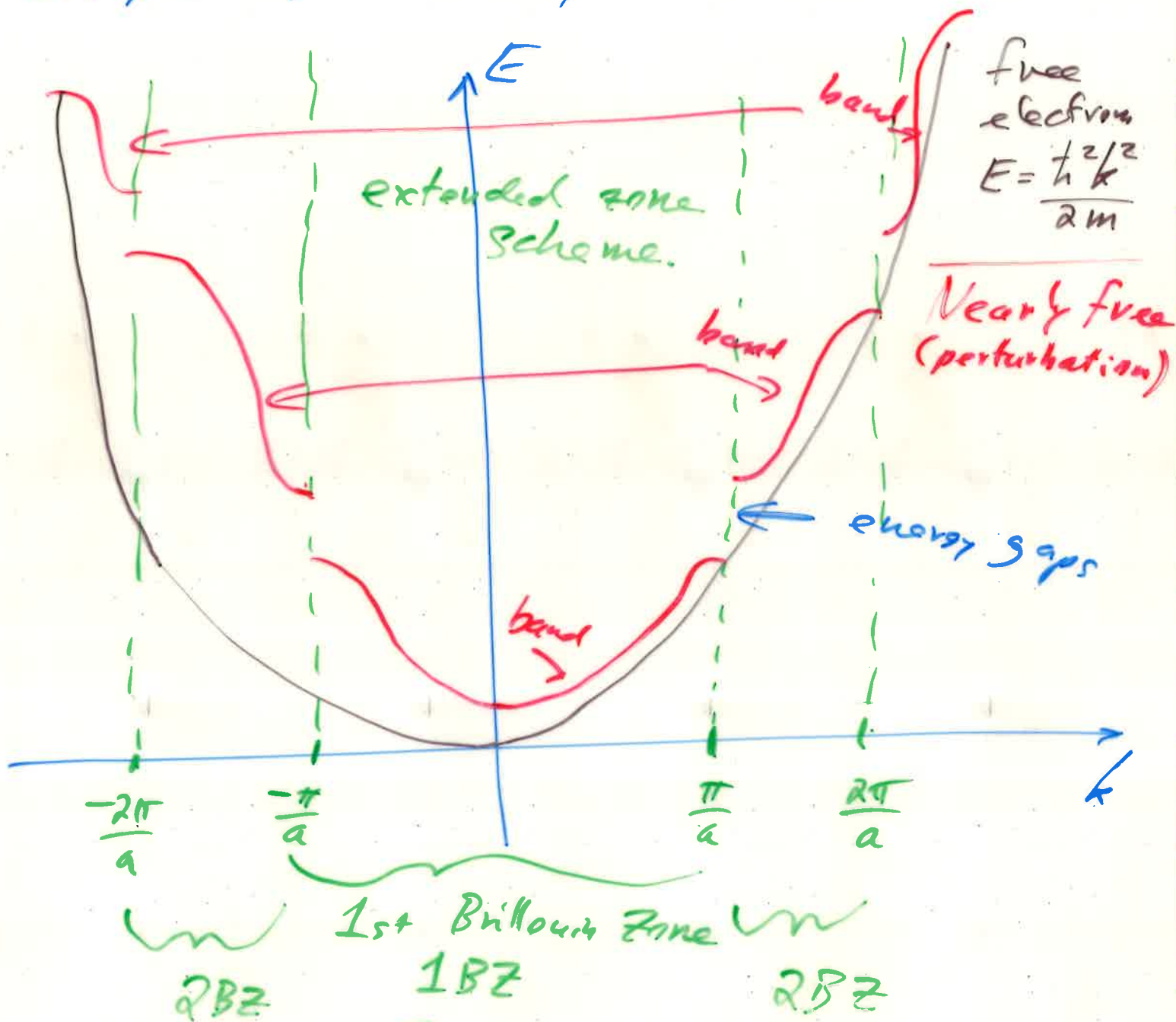
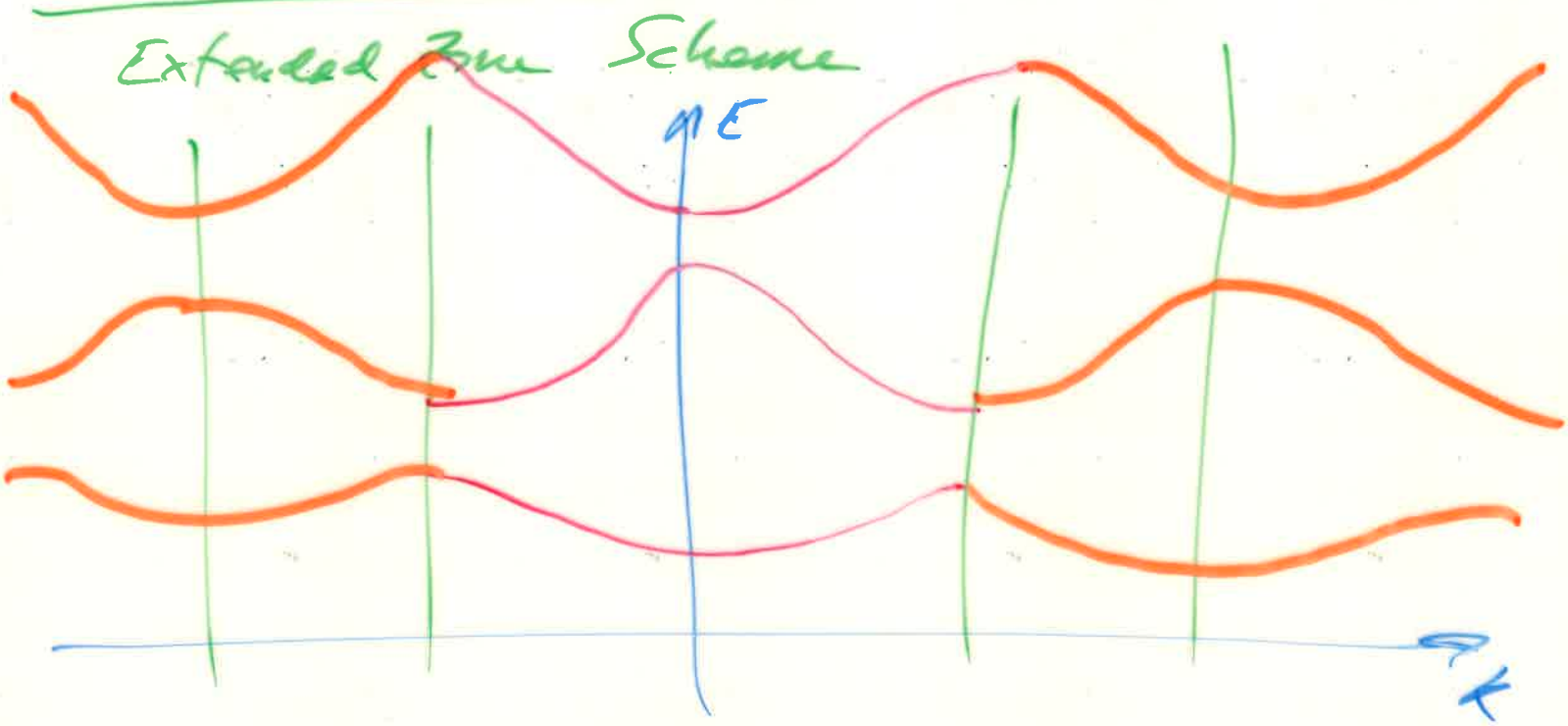
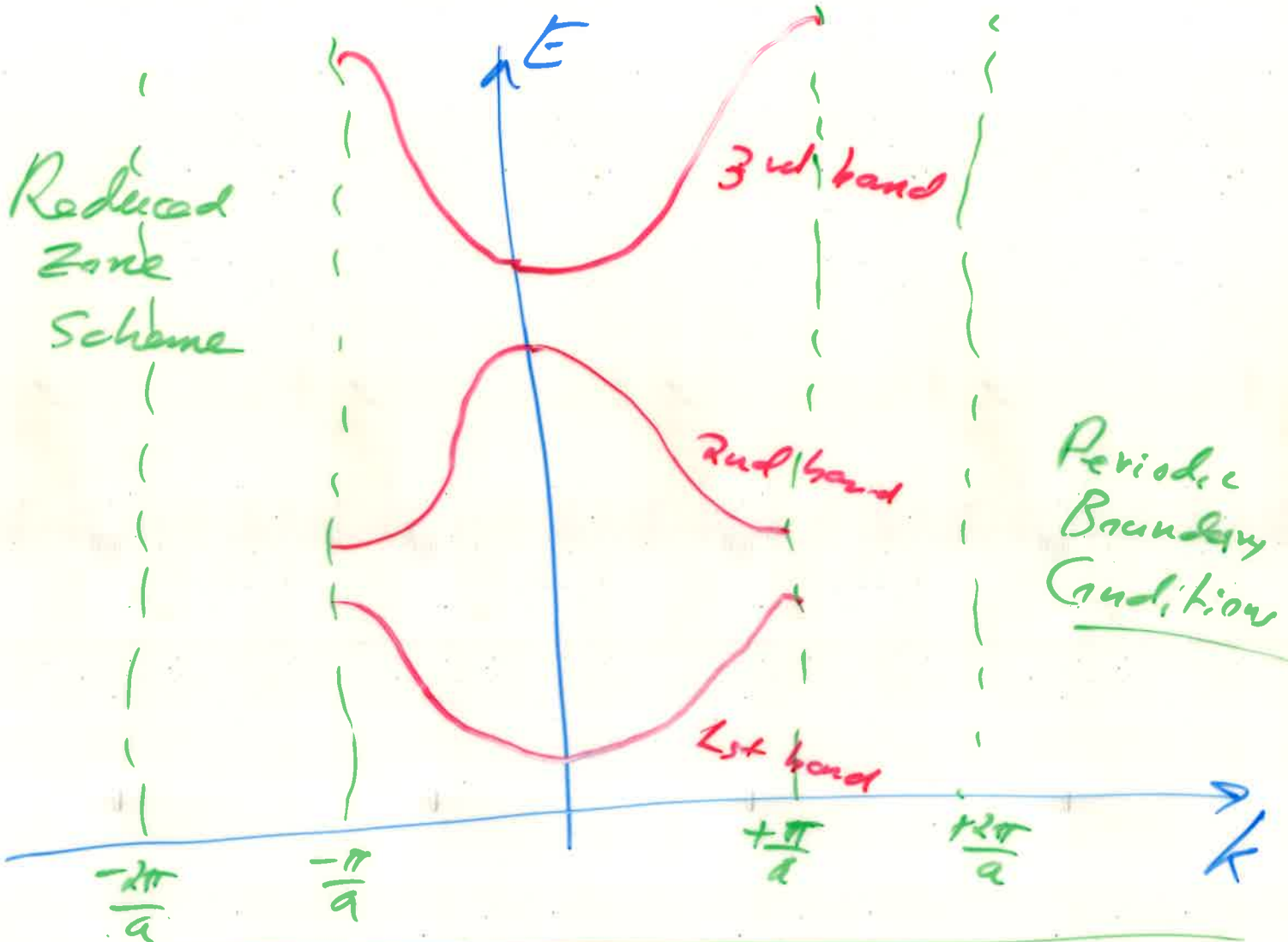


Chapter 9 - Energy Bands



All BZs have the same "volume".

For phonons, k 's outside the 1BZ \rightarrow wavelengths shorter than $2a$.



Suppose N p-cells in a crystal.

How many electron states (orbitals)?

$$2N$$

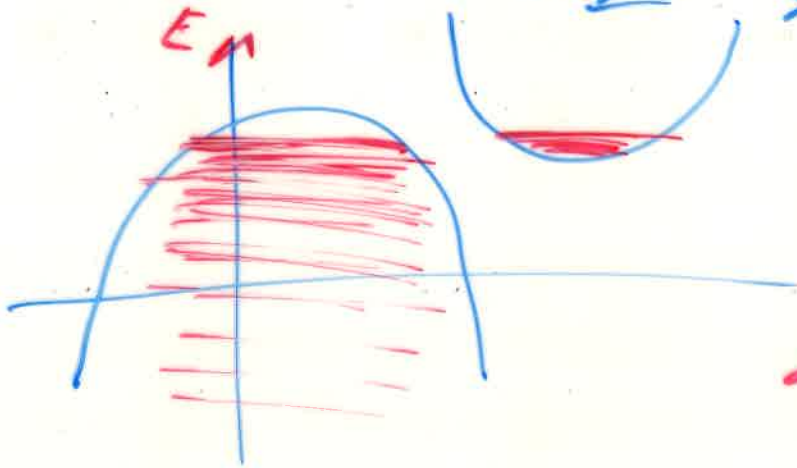
\times polarization

$N_e \equiv$ # electrons per atom

$n \equiv$ electron concentration $[n] = \text{m}^{-3}$ (MKS)

If $N_e = 1 \rightarrow$ the bands are $\frac{1}{2}$ full.
Will necessarily be metals.

If $N_e = 2 \Rightarrow$ might get an insulator.



depends on band overlap.

1-dimension, you do get an insulator.