Outer Control Loops

To determine Qxeb, Preb

Load the Inlet and Outlet
V_{sq} \to 0 \text{ due to PLL frequency tracking}
Regulated DC Power Pole
One option, many implementations

\[ \text{V(i) ideal} \rightarrow \text{V(i) meas} \rightarrow \text{PV} \rightarrow \text{Pdc external} \rightarrow \text{PV limits} \rightarrow \text{PV} \]
- Voltage Sourced Converter HVDC
- Transmission
- MMC, Multi-Level Converters
- Type 3 & Type 4 wind turbines
- Bridges on Multi-Level
- PV Systems (Large)
- Other Generation or Storage with DC Link
- P_{external} (or I_{external})
  controlled at DC source to meet external demands

- Wind turbine applications on PV
  → to maximize capture of available energy generation
$E_{inj}$ (Pinj) → $I_{ext}$, $P_{ext}$

DC Source

VSC

VSC

(VSC, wind turbines, HVAC, flywheel)

DC/DC

(PV, fuel cells)

maybe transform
Type 4 turbine

PM Synch generator
Type 3 wind turbine

Grid

Stator

Wound rotor

Induction generator

VSC

VSC