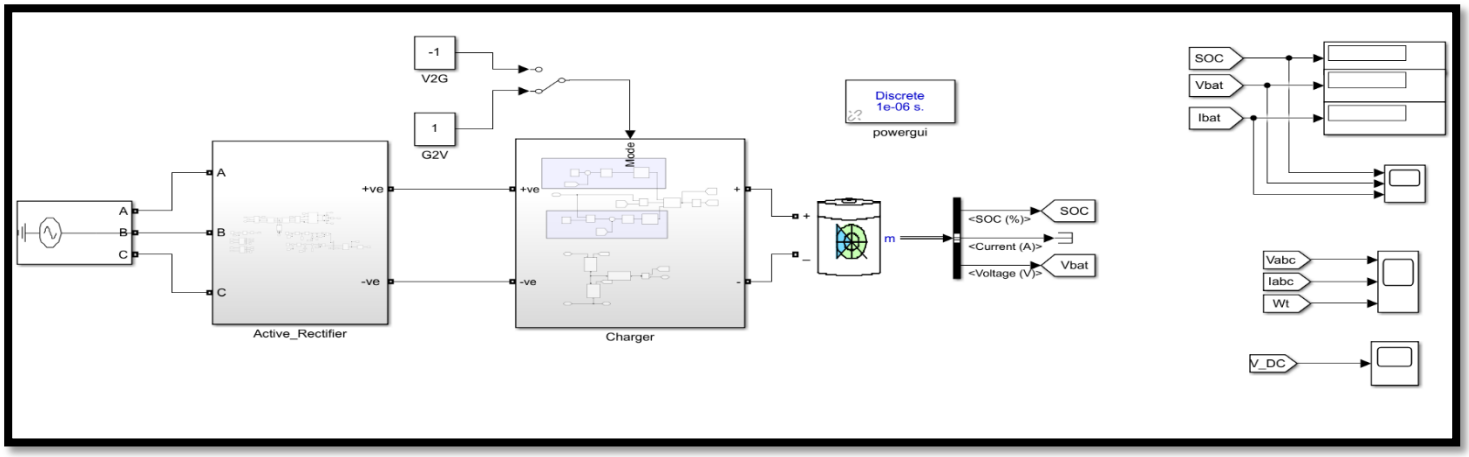
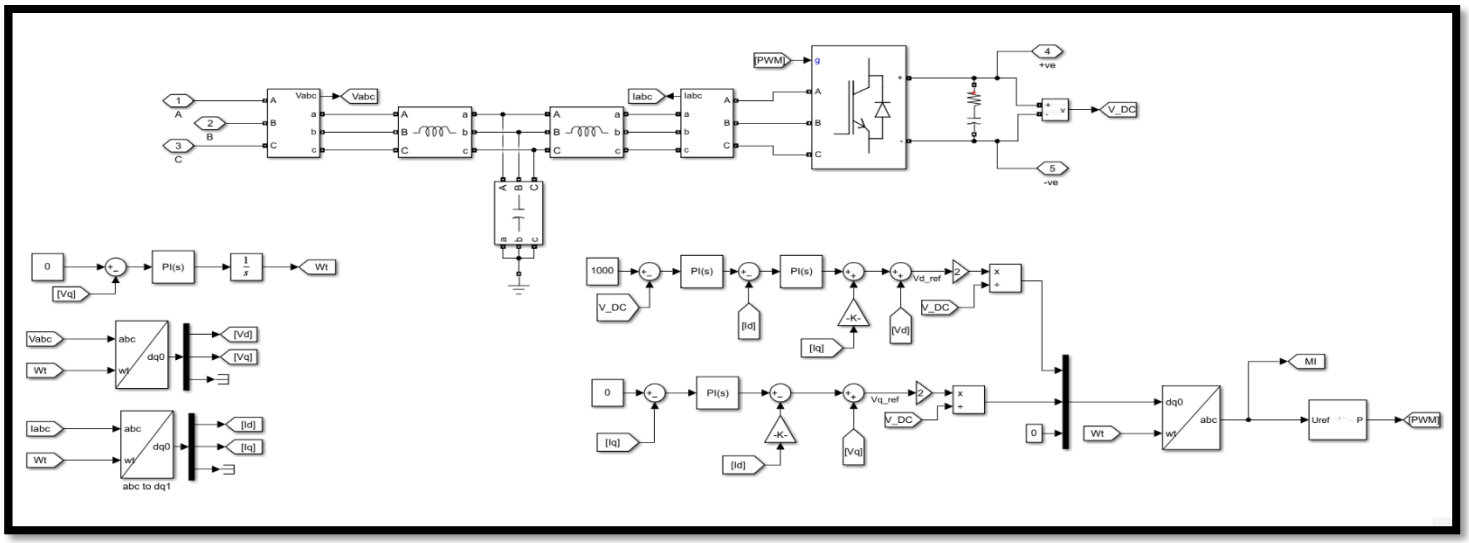
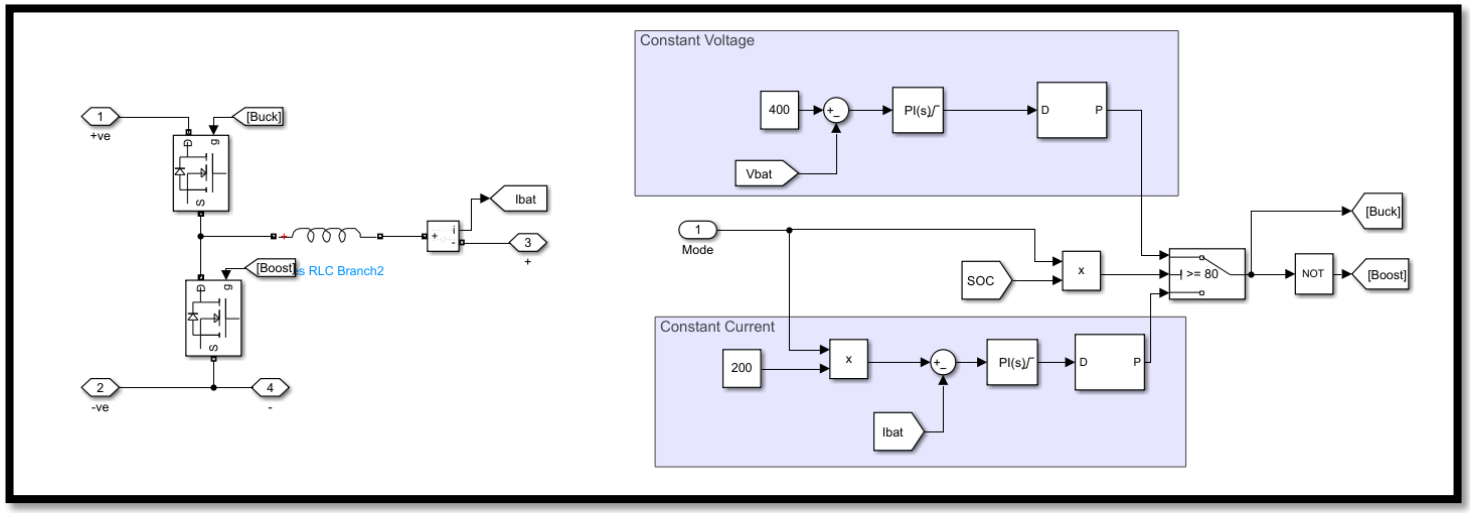
Active Rectifier & Charger

MATLAB Model:







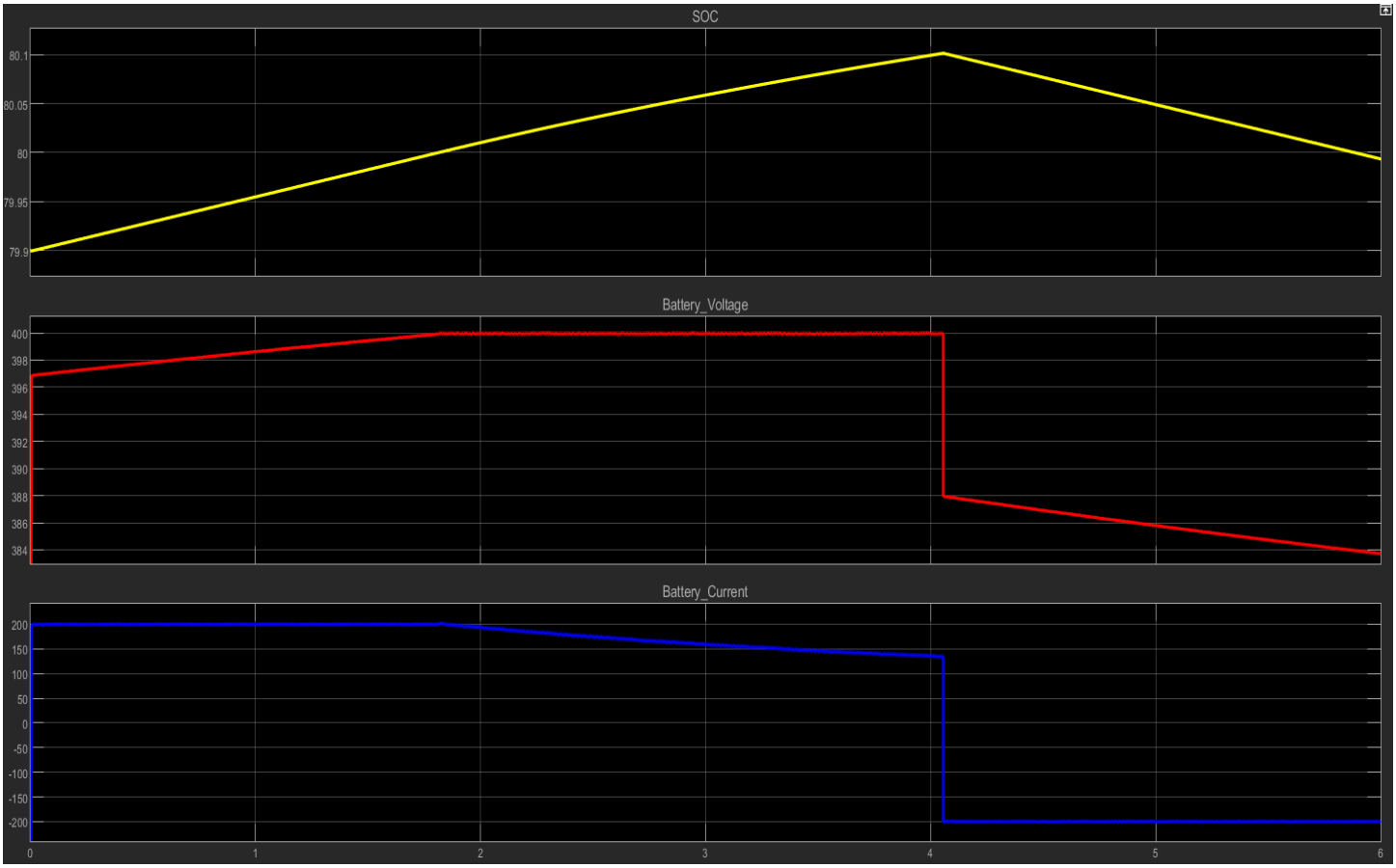
Model Construction:

- Three Phase Voltage Source (Grid).
- Active Rectifier:
  - LC Circuit.
  - Three Phase Controlled Rectifier.
  - RC Circuit.
- Charger:
  - Bi directional DC-DC converter (Buck Boost).
  - CC-CV control algorithm.
  - Battery pack.
- Manual Switch:
  - Grid to Vehicle (G2V).
  - Vehicle to Grid (V2G).

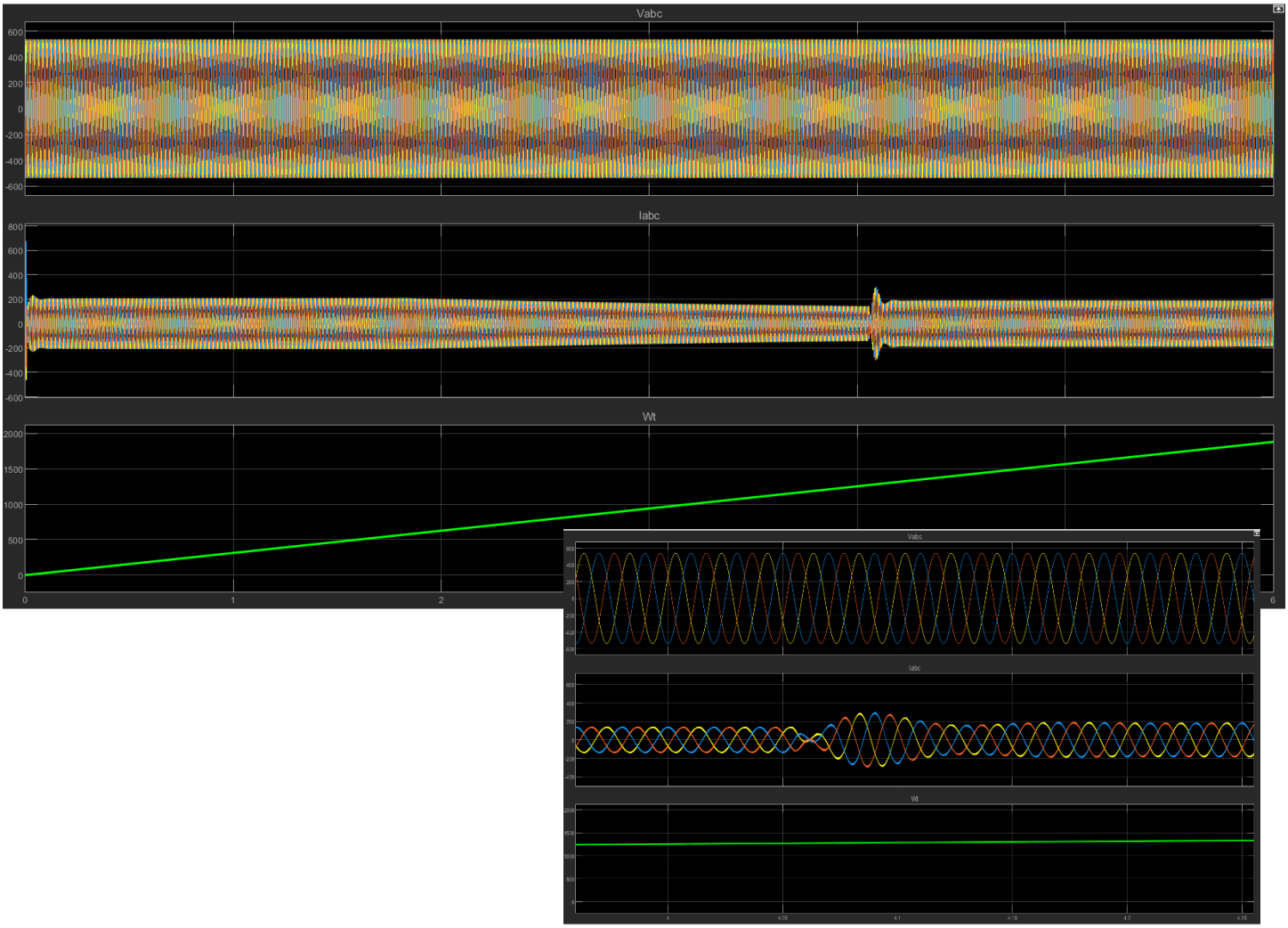
Scopes outputs:

- The scenario used on the following graphs is:
  - Active rectifier adjusted to produce pure DC voltage with **1000V**.
  - The Battery pack is 360v nominal voltage and 100A capacity and **79.9 %.**
  - At first, System will be used to charge batteries **(G2V).**
  - **Constant current mode** (200A charging) will operate till reach **80%** then **Constant voltage** (400 V charging).
  - While operating at **Constant voltage,** User will switch the manual switch to **(V2G).**

- Battery Specifications (SOC – Volt – Current).



- Three phase voltage and Current before Active Rectifier (Small screen for zooming).



- DC voltage after Active rectifier