

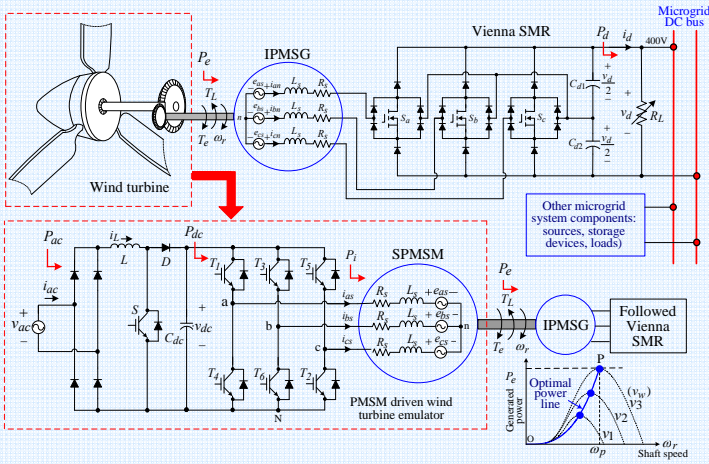
# 電機控制實驗室 (Electric Machine Control Lab.)

地點: 資電館503室

負責老師: 廖聰明 (C. M. Liaw)

研究項目: Power Converters, Motor Drives, Electric Machine Control

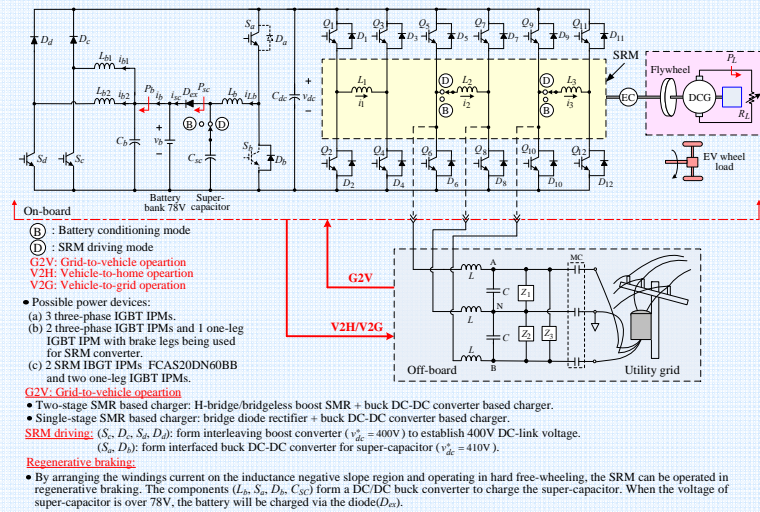
## A PMSM Driven Prime Mover Emulator



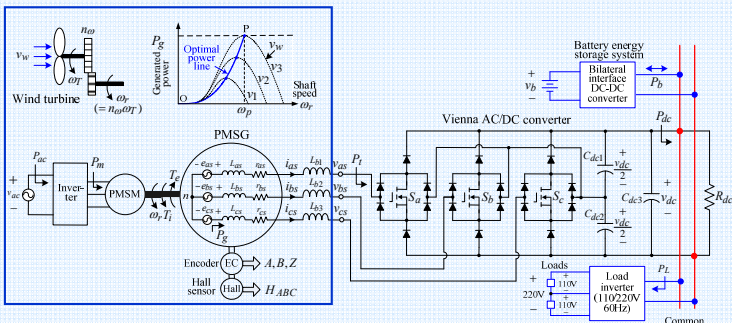
## EV Switched-Reluctance Motor Drive with Multiple Functions of Driving/Regenerative Braking, G2V/V2H/V2G

- **Motoring mode:** voltage boosting, regenerative braking, reversible driving.
- **Common DSP** for multiple power stage digital controls.
- **Charging mode:** SMR-based charger is formed by the embedded components to conduct G2V operation.
- **Discharging mode:** generate 220V/110V 60Hz AC voltages from the battery bank to conduct V2H and V2G operations.

System configuration of the developed EV SRM drive with cascaded battery/SC



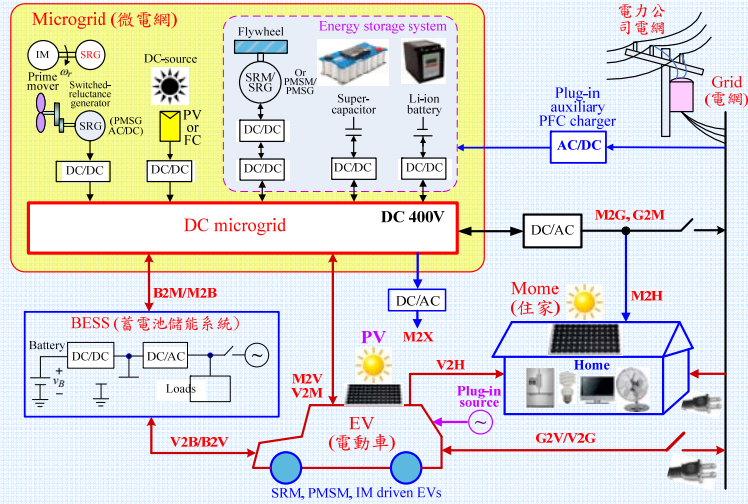
## Wind Interior Permanent-Magnet Synchronous Generator



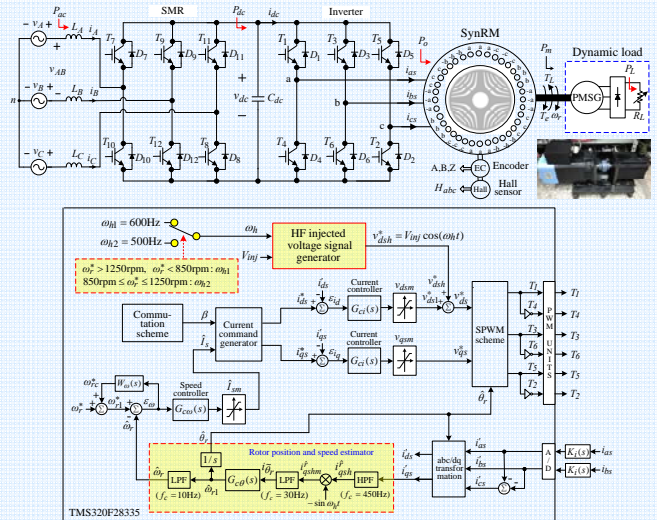
- **Wind IPMSM:** Interior PMSM, 6-pole, 3000rpm, 1kW
- **SPMSM prime mover:** SPMSM, 4-pole, 3000rpm, 2kW
- **Power converter:** The Vienna rectifier is established with three off-the-shelf modules (IXYS VUM 25-05E, 500V, 35A).

## Experimental Home DC Micro-grid Incorporating with Battery Energy Storage System and Electric Vehicles

- **Electric vehicles are incorporated as storage devices.**
- **Operations:** V2G, G2V, V2H, V2M, M2V, B2G, G2B, B2M, M2B, B2V, V2B.



## Position Sensorless SynRM Speed Drive



## EV IPMSM Drive with Super-capacitor Energy Storage and Photovoltaic Auxiliary Energy Harvesting

