Paris Session 2022

# OSMOSE WP3: grid forming capability and synchonisation services

SC C4

PS3

**Question 16** What local- and whole-system considerations shall be applied to optimise the design and mitigate any potential side-effects when using synchronous condensers, grid-forming inverters, or a combination to address emerging system stability issues?

Carmen CARDOZO – France – RTE R&D

# OSMOSE WP3: definition of grid forming capability

A GFM unit shall, within its rated power and current, be capable of self-synchronise, stand-alone and provide synchronization services.

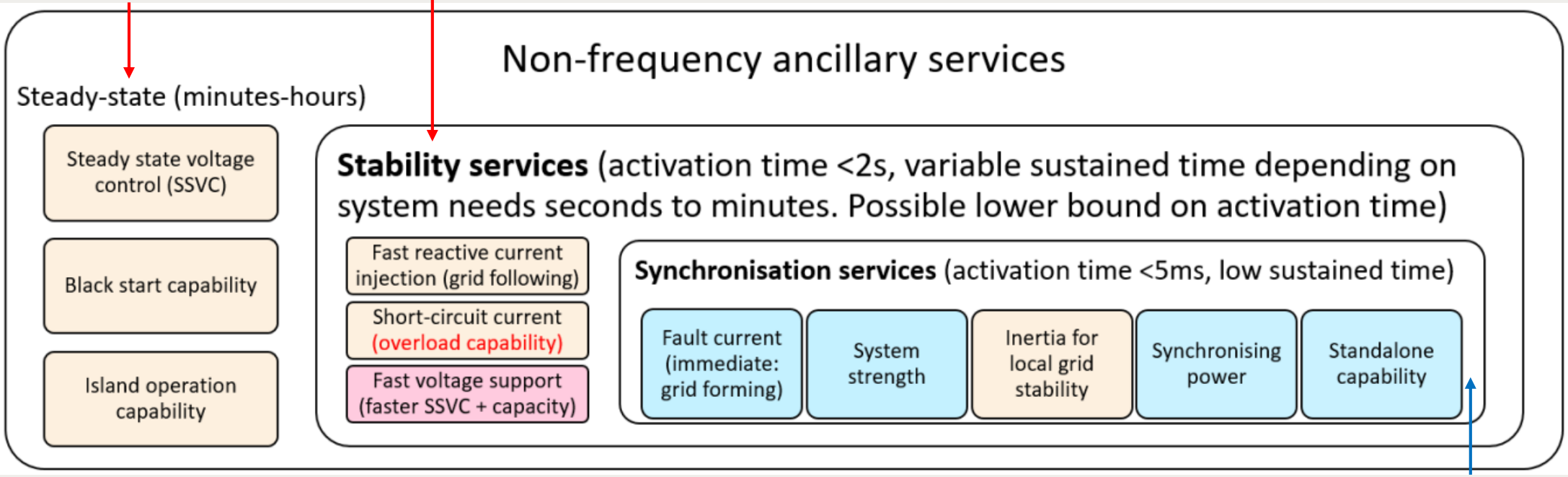
- By definition, a GFM does not rely on specific grid conditions to synchronise: it can operate at a wide range of short-circuit ratios and inertia levels.
- Synchronization services include a natural/ inherent/ immediate/ undelayed deployment of synchronising power, system strength, fault current and inertial response.
- Hence, a GFM unit will help others to maintain synchronism under stressful conditions, while still complying with the general requirements applying to the specific technology.
- No overload or capacity reservation is associated to the GFM capability, neither the provision of traditional ancillary services such as primary voltage and frequency regulation



[1] Immediate means subcycle. A 5 ms maximal response time threshold could be adopted as proposed in GC0137
[2] Taking into account physical components between the converter and PCC (filters, valve reactors, transformer…).

# OSMOSE WP3: definition of synchronisation services

Out of scope of GFM with the existing frequency regulation services that can be provided by grid following units[1].




[1] Grid following units (normal operation) may include an island mode or black start capability (switch to V-f mode)

GFM is the **capability** to provide (some) synchonisation services

# OSMOSE WP3: types of GFM units and suited technologies