Paris Session 2022

DSO-TSO interconnection challenges

Study Committee C6

PREFERENTIAL SUBJECT 2, Q 2.3

Are there any actual challenges or issues in the operation of the power system between the TSO and DSO due to the mass deployment of RES/DER?

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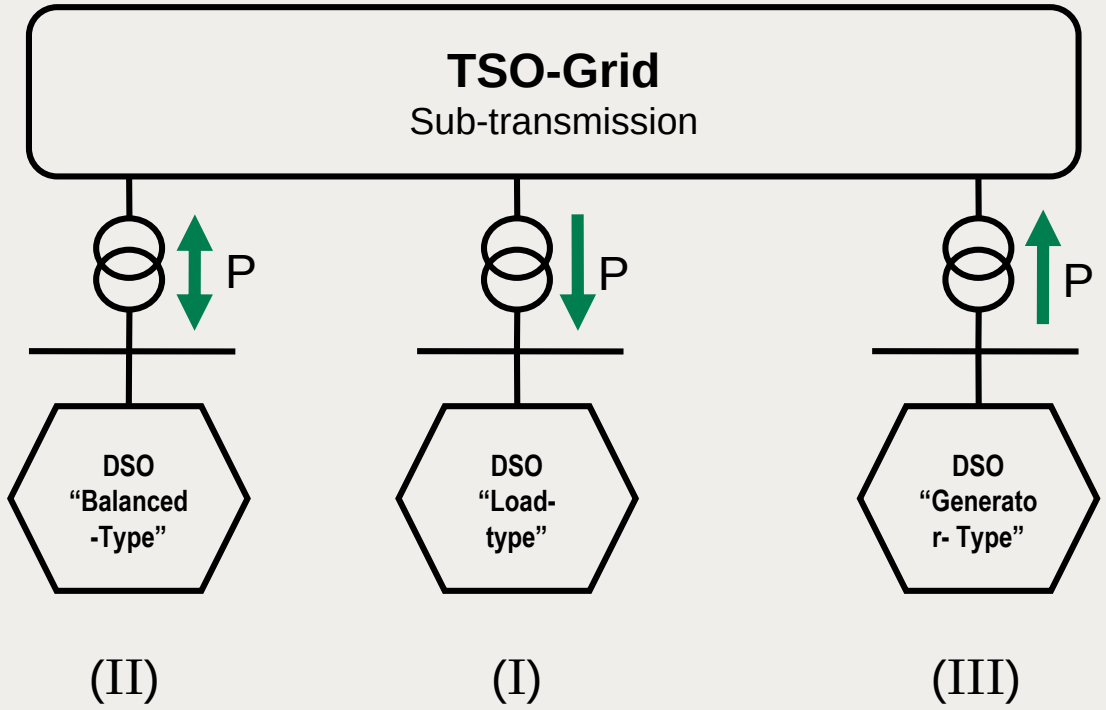
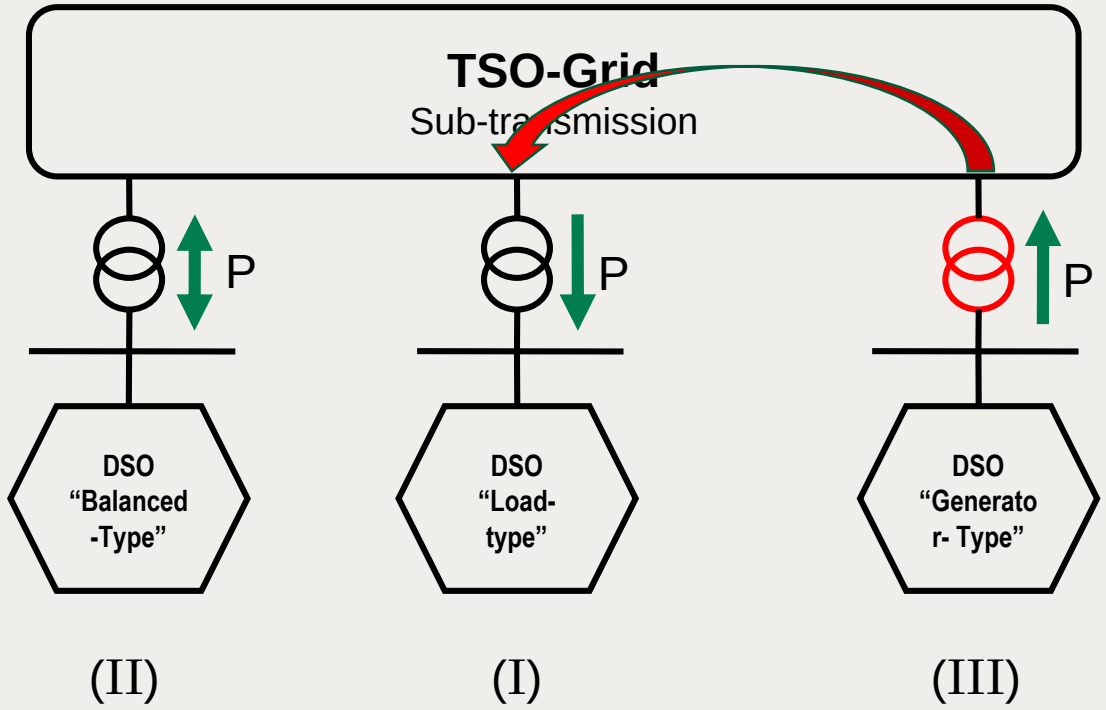
Impact of high penetration of RES on DSO-TSO interconnection

- Three type of DSO-grids:
  - (I): Classic load driven
  - (II): Medium RES penetration
  - (III): High RES penetration
- Main load flow direction:
  - (I): From TSO to DSO
  - (II): Both direction
  - (III): From DSO to TSO



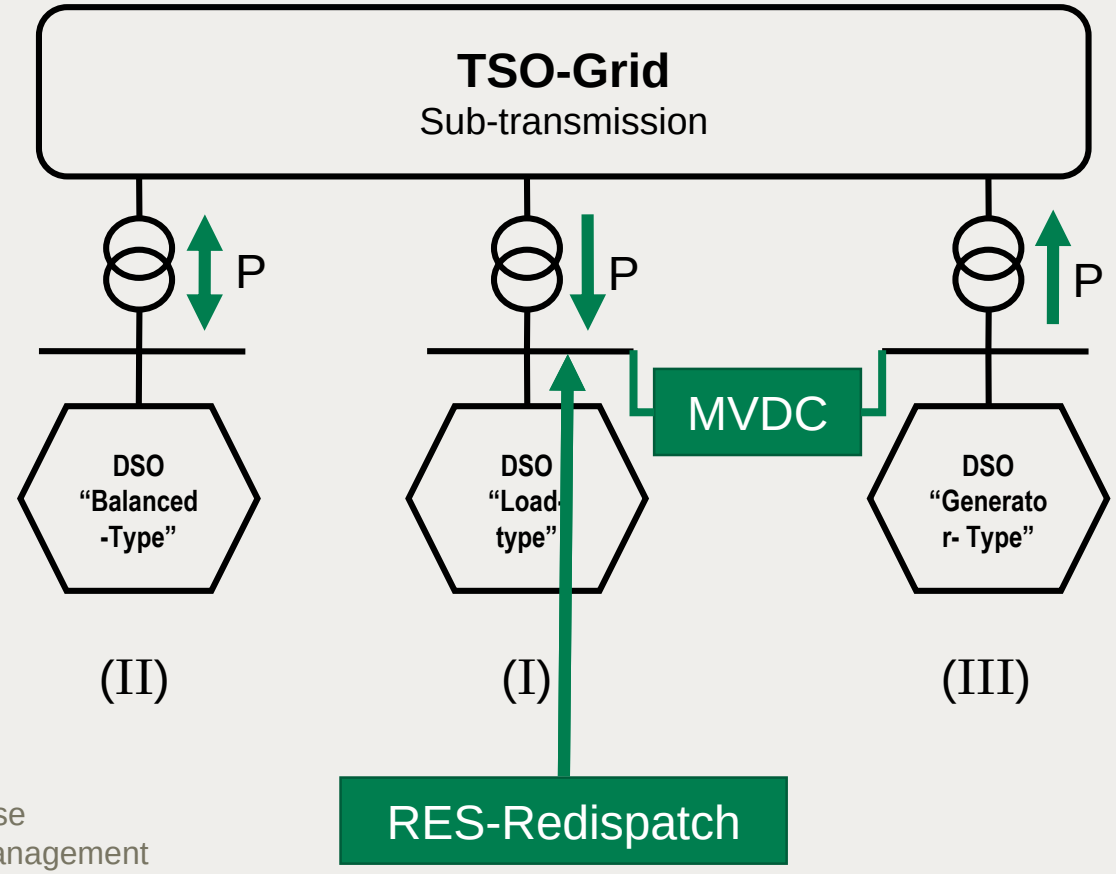
Impact of high penetration of RES on DSO-TSO interconnection

- High penetration can lead in
  - High load of transformer (III)
  - High load in TSO-Grid (III-I)
  - Low load flow (II)
- Because:
  - Not designed for bidirectional load flow
  - Overplanting of RES connected in DSO's grid



Impact of high penetration of RES on DSO-TSO interconnection

- Possible solutions:
  - RES-Redispatch based on actual situation and forecast/schedules
  - Optional load control (DR/DSM)
  - MVDC Back-to-Back converter to transfer energy horizontal between two MV-grids to avoid congestions on the sub-transmission level
  - Cost benefit analysis necessary



DR: Demand response
DSM: Demand side management