

Paris Session 2022



Evaluation on voltage control performance by updating power factor setting of photovoltaic in distribution system

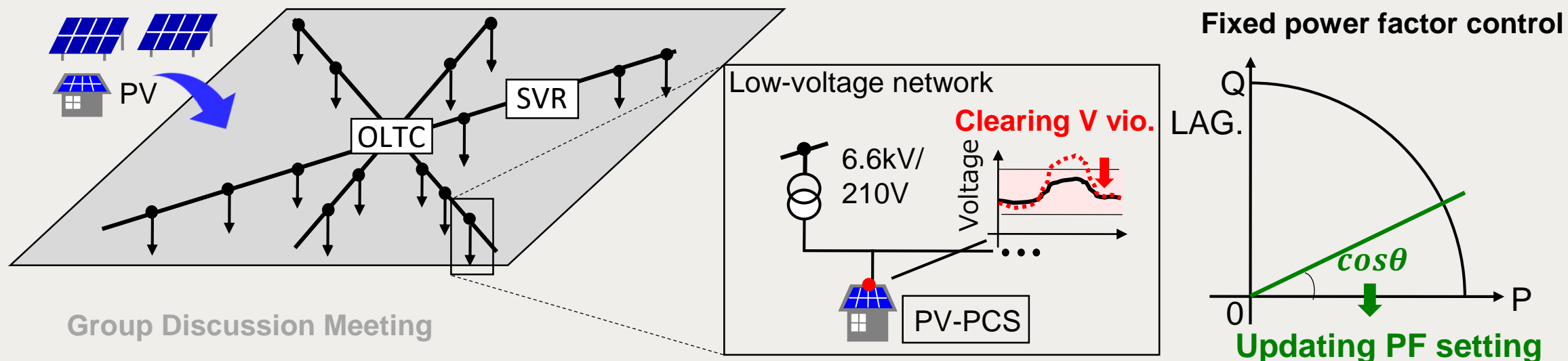
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Hideo ISHII, Japan



Challenges for distribution system operators (DSO)

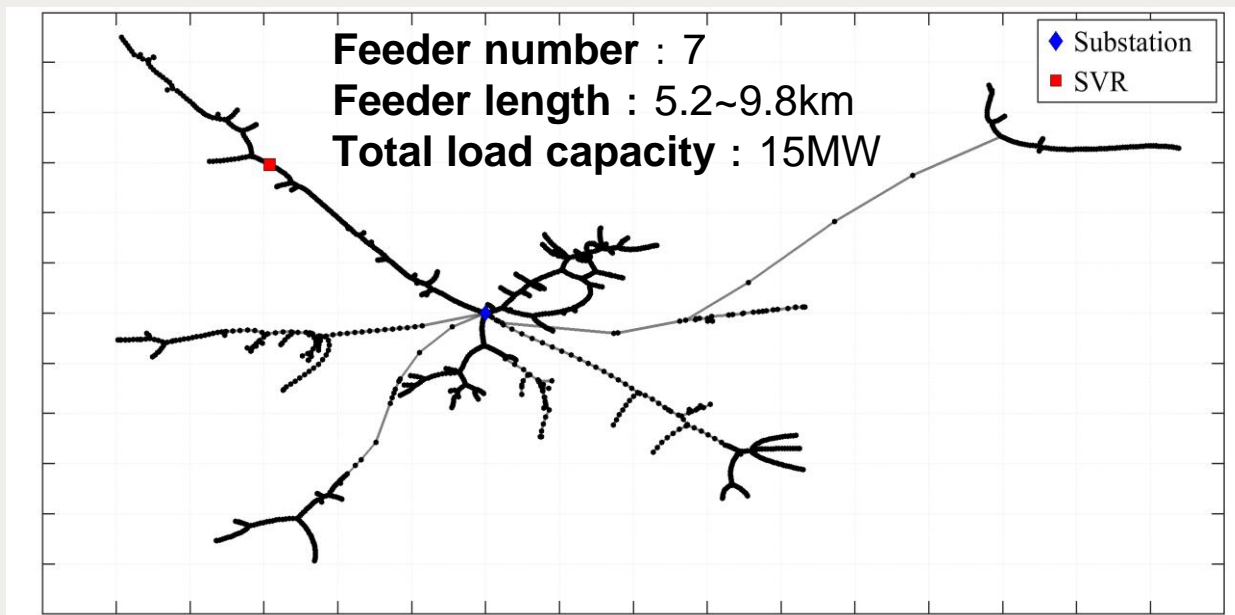
- Increasing of photovoltaic (PV) penetration for realizing sustainable society
- Challenges for DSO:
 - Clearing voltage violation caused by PV penetration to maximize hosting capacity
- Target of voltage control scheme
 - **Fixed power factor (PF) control** of PVs



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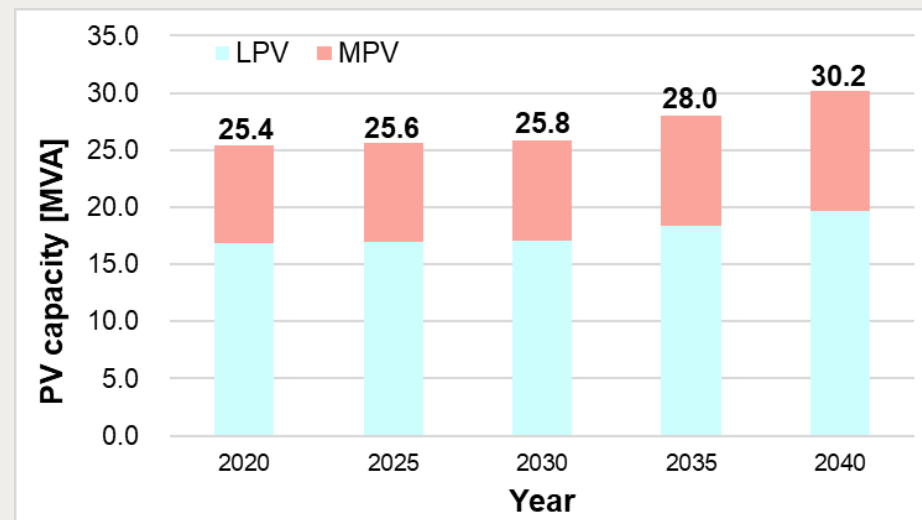
Simulation condition to evaluate voltage control performance

- **Overview** : Evaluation on PV hosting capacity
 - Default PF setting (Medium-voltage(6.6kV) PV: MPF90, Low-voltage(210/105V) PV: LPF95)
 - Updated PF setting
- **Distribution system model** : severe model



- **PV penetration scenario**

– Year: 2025 to 2040



Group Discussion Meeting

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Results and Conclusion

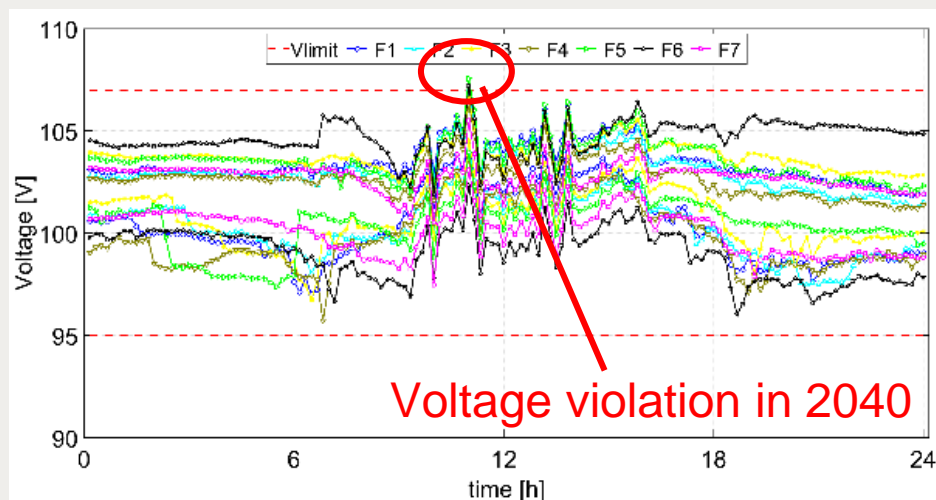
Voltage regulation with **default PF setting**

Year	2020	2025	2030	2035	2040
Evaluation	○	○	○	○	×

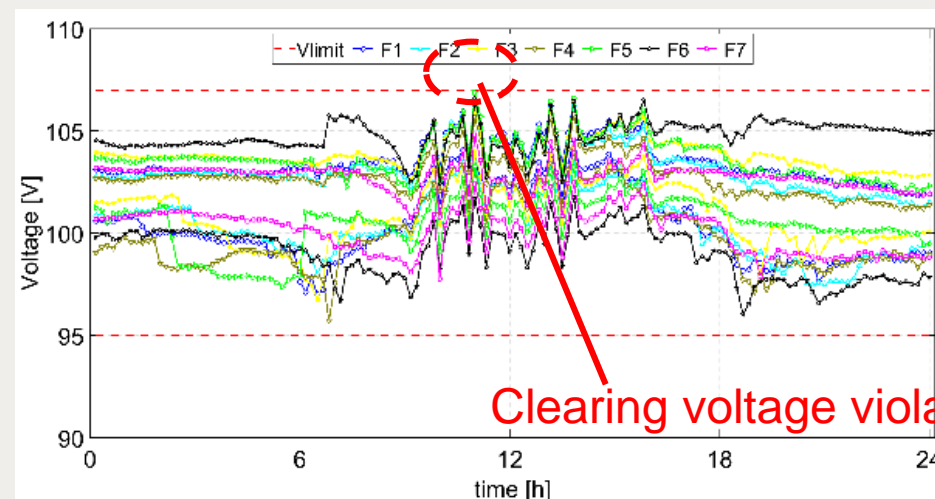
Effectiveness of updating PF setting

- PF should be changed according to network conditions
- Harmonization with OLTC / SVR operation is crucial

Default PF setting (MPF/LPF=90/95)



Updated PF setting (MPF/LPF=92/95)



Group Discussion Meeting

voltage profile in 2040

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