

# 論点1

- → 日本のFlexibilityの現状は?
- → 再エネ大量導入に向けて、どのような展開を見据えるべきか?

関西電力送配電

# 再エネ大量導入を見据えた現状 ~想定される課題と現在の解~ 2

### TSO視点

基幹系・全系レベルで再エネ特性への対応が必要

- 間欠性:スケール (線路単位、地域単位、ノード単位等) によって異なる課題
  - 周波数維持や電圧、系統安定性なども課題
- 時限性:いわゆる"ダックカーブ"の課題
  - 周波数維持や電圧、系統安定性なども課題
- 偏在性:特定の系統にのみ生じる系統混雑の課題
- ・基本は調整力による対応
- Flexibilityの概念に近いの はノンファーム接続くらいか
- → 現在の解: 調整力電源による調整、ノンファーム接続、N-1電制、出力抑制···

### DSO視点

6kVクラスの再エネへの対応・メッシュ状系統を前提とした検討が必要

- 間欠性:電圧変動(過昇)、系統の混雑管理が課題
- 時限性: ( 同上 )
- 偏在性: ( 同上 )

Flexibility的要素は、 ほぼ存在しない

→ 現在の解;

電圧変動:電圧監視と電圧調整器による制御

系統混雜:系統切り替え、系統增強、出力抑制

# カーボンニュートラル実現レベルの再エネ大量導入で想定される課題 3

## TSOが採る対策・行動(想定)

- 周波数: 全系レベルで再エネの間欠性に追随、対応

- 電圧・安定度: 線路や地域単位でFlexibilityを活用

- 系統混雑: (同上)

### DSOが採る対策·行動(想定)

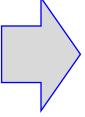
- 電圧: 街区レベルや配電線区間単位でFlexibilityを活用

- 系統混雑: (同上)

Flexibility Resourceの 必要量が確保できない恐れ

TSOとDSOの視点で、求めるFlexibilityが若干異なる

- ・Flexibilityが必要な地域の違い
- ・必要なFlexibilityの方向(上げ/下げ)と大きさの違い
- ・Flexibilityが必要な時間の違い



TSO/DSO間での Flexibilityのバッティングが 生じる恐れ

### 課題①

TSO/DSO間で、Flexibilityをどのように調整して活用するか?

### 課題②

再エネ"大量"導入に対して十分なFlexibility Resourceをどう確保するか?

### 課題③

必要な地域・locationで必要な量のFlexibility Resourceをどう確保するか?

## **課題①**: TSO/DSO間の調整

- TSO/DSO間の連携強化
- Flexibilityの"見える化"、統合プラットフォームなどの環境整備
- → データ利活用や"プラットフォーム"の議論など、関連する動きはある

## 課題②: 十分なFlexibility Resourceの確保

- 現時点からFlexibility Resource活用の意識づけと利活用促進
- → 調整力市場へのDRの参画や、アグリゲーターの活性化など動きはある

## 課題③: 必要な地点での必要な量のFlexibility Resourceの確保

- 再工ネ適地や系統の脆弱箇所の見極め(Flexibilityが必要な箇所の見極め)
- Flexibility Resourceの対象資源の拡大と必要な地域への設置誘導
- → 現時点で具体的な解や動きが見当たらない…



# Theme 1

- → What about the current status of Flexibility in Japan?
- → What kind of evolution should we consider in terms of mass deployment of RES in Japan?

KANSAI Transmission and Distribution

### TSO point of view

Required to cope with RES as bulk system/whole system

- Intermittency challenges varies in terms of scale, location, area, nodes maintain frequency, voltage problem and system stability are also challenges
- Time domain matter
   "Duck Curb" problem
   maintain frequency, voltage problem and system stability are also challenges
- Localization congestion problems on specific lines/areas only
- Basically frequency adjustment only
- similar to Flexibility is only
- → Current Solution; Non-firm.

  adjustment power, non-firm connection, N-1 restriction, generation suppression…

## **DSO** point of view

Taking 6kV class RES and mesh-like grid into consideration

- Intermittency: Voltage and congestion problems
- Time domain matter: (the same as above)
- Localization: (the same as above)

→ Current Solution;

Voltage fluctuation: SCADA and voltage control
Congestion: grid switching, reinforcement, generation suppression

There is nothing about "Flexibility".

#### **Action on TSO side**

- For frequency: Cope with intermittency as whole system level
- For voltage/stability: Utilize Flexibility on lines/areas
- For Congestion: (the same as above)

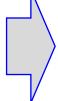
#### **Action on DSO side**

- For Voltage: Utilize Flexibility on city block/feeder
- For Congestion: (the same as above)

Concern; Lack of volume

Required Flexibility is different from TSO & DSO.

- Required location/area
- Required direction (up/down) and volume
- Required time of the day/week



Concern; Conflict about Flexibility between TSO & DSO

## **Challenge-1**

How to manage/utilize Flexibility between TSO & DSO?

## **Challenge-2**

How to ensure enough volume of Flexibility Resources?

## **Challenge-3**

How to ensure Flexibility Resources on the required location/area?

## **Challenge-1**: Harmonization between TSO & DSO

- Strengthen relationship between TSO & DSO
- Ensure visibility of Flexibility, set up Integrated Platform
- → Related/similar movement, such as Data Utilization, "Platform", etc.

## **Challenge-2**: Ensure enough volume of Flexibility Resource

- Enlightenment/Enhancement of Flexibility Resource utilization
- → Related movement, such as DR participation to Adjustment Market, growing Aggregators

# <u>Challenge-3</u>: Ensure Flexibility Resource on required location/area

- Find out required location/area, such as RES favorable are, vulnerable point of grid, etc.
- Expand Flexibility Resource, Induction resources to required location/area
- → There is no comprehensive solution and actual movement…