

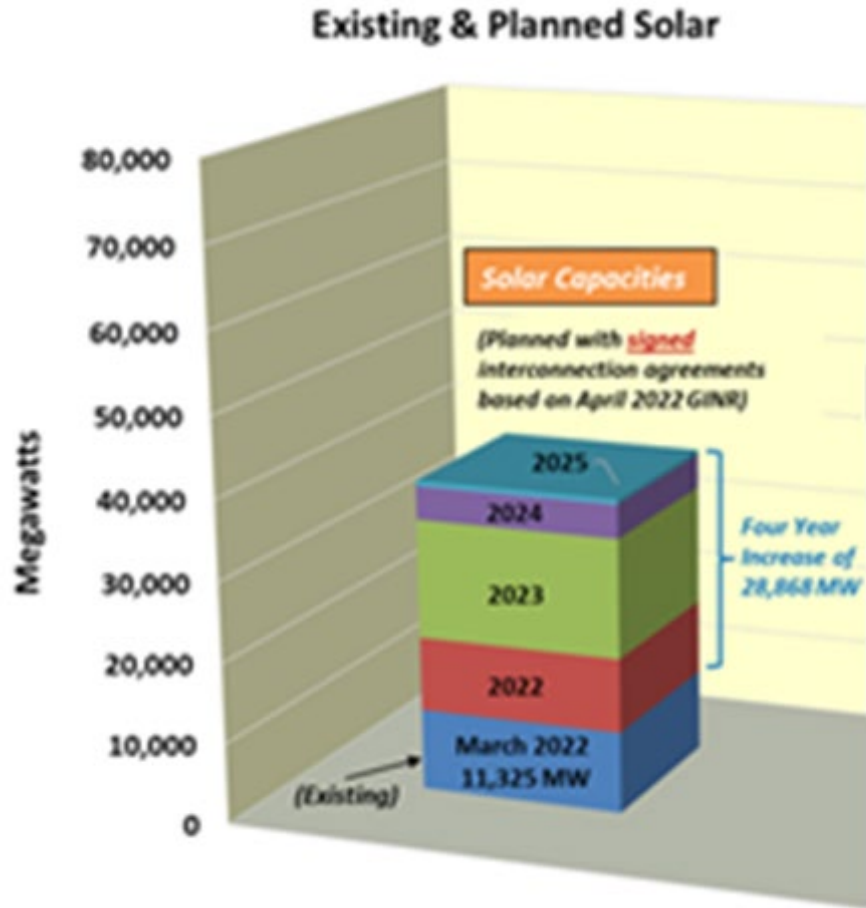


TEXAS RE
Ensuring electric reliability for Texans

Inverter-Based Resources (IBR) Update NSRF Meeting

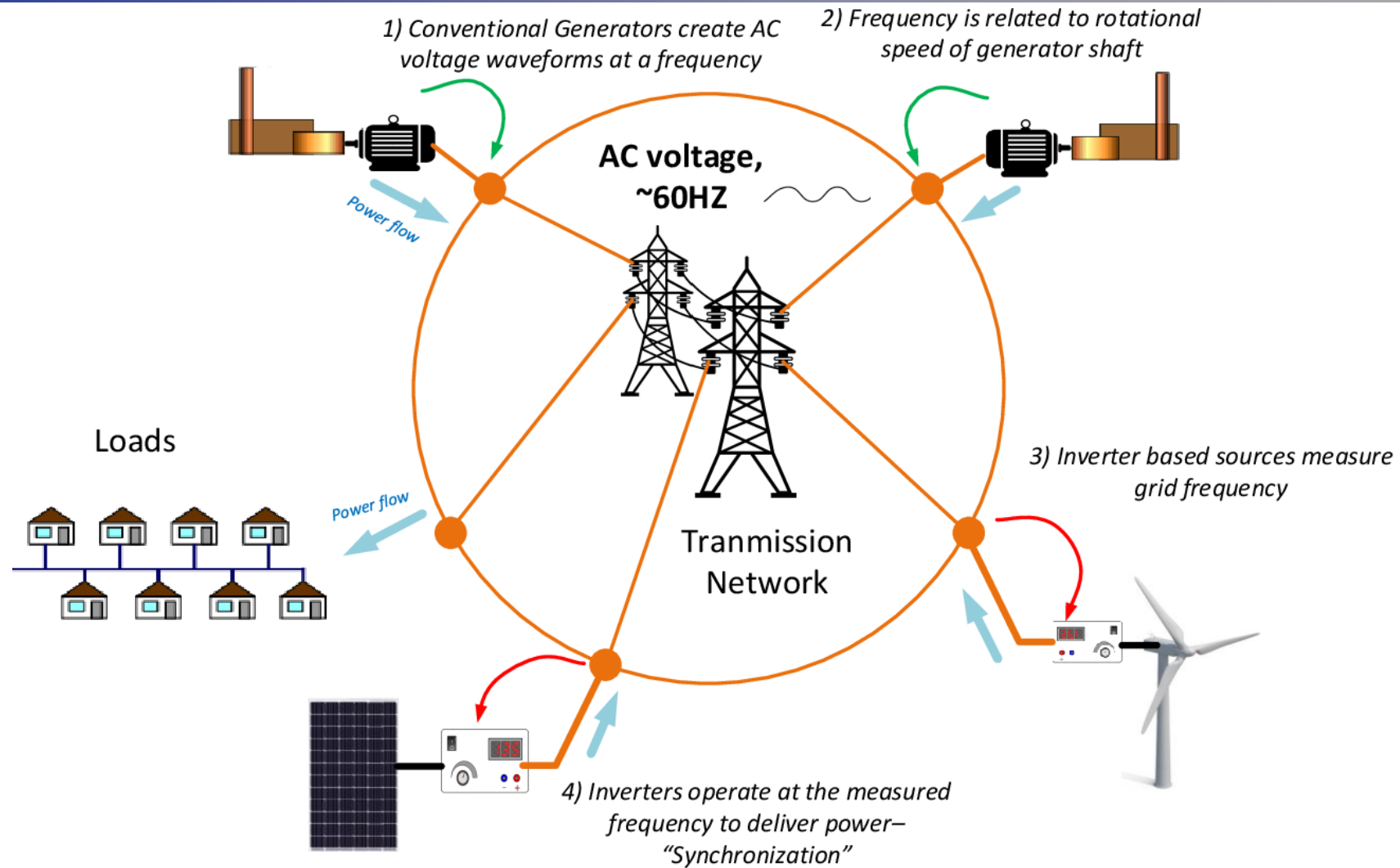
Brad Woods
Senior Engineer
Texas RE Reliability Services

ERCOT Generation Interconnection Requests (GINR)



- Existing (3/2022): **11,325 MW**
- Planned (2022-2025): **+28,868 MW**
- Total (2025): **40,193 MW**

Conventional Resources VS Inverter-Based Resources



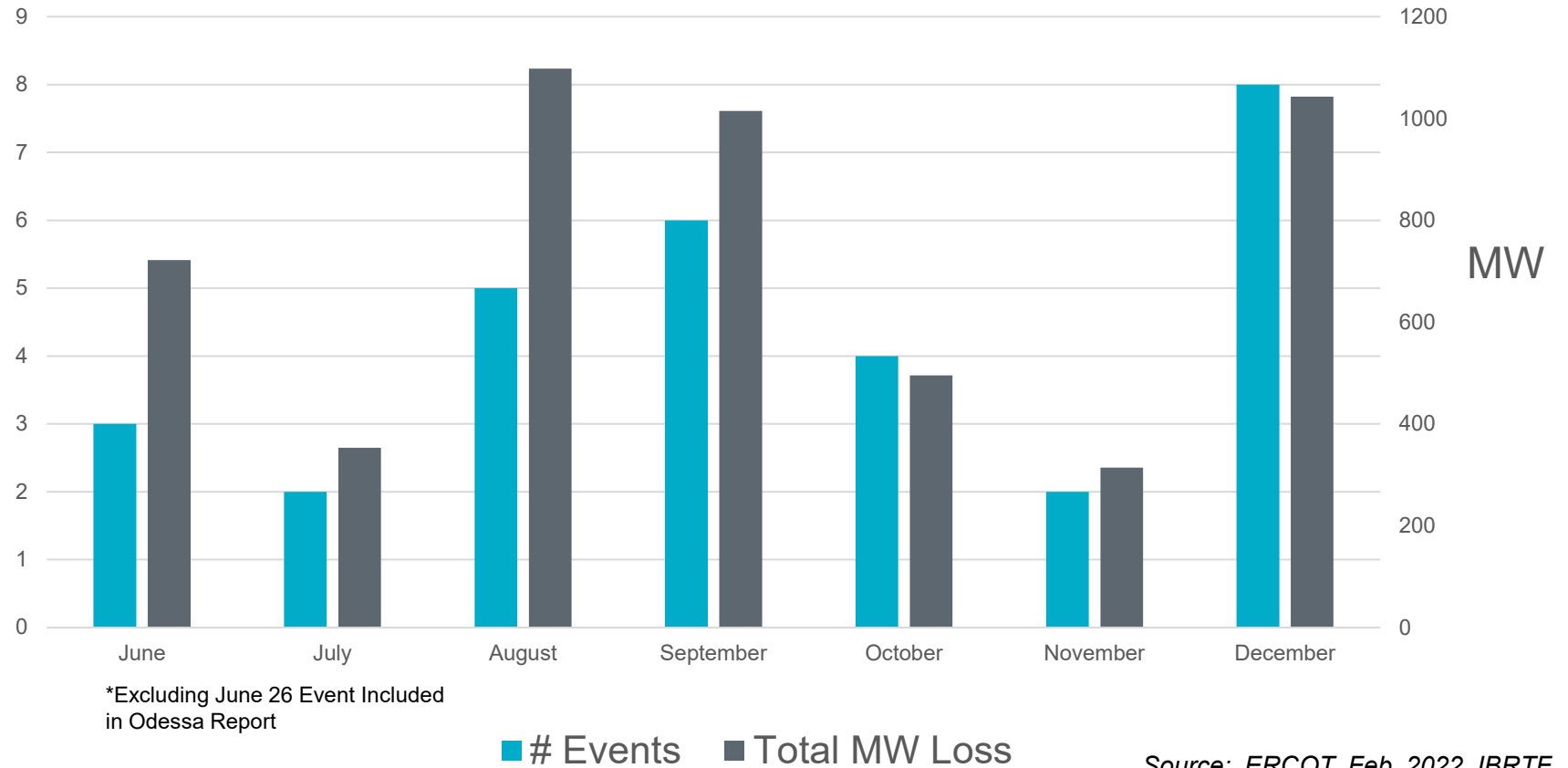
ERCOT Solar Loss Events

ERCOT following up on recommendations from May/June 2021 Odessa Disturbance report

Issues primarily involve settings of inverter and plant controls and proper modelling

Solar owners are cooperative but awareness of issues often lacking and reactive

ERCOT Detected Solar Events ~100 MW or Greater
June – December 2021



Source: ERCOT, Feb. 2022 IBRTF

Recent Events

March 16th - 345kV Alibates to Grandview Wind line tripped at 04:16 with a corresponding loss of roughly 680 MW of wind generation

- 273 MW wind generation directly tied to line
- Roughly 407MW tripped and was non-coincident

June 4th – Odessa Disturbance Again - OECCS units tripped due to a failed lightning


- Fault occurred on June 4th at 12:59:25 PM
- Preliminary estimated loss of 2,519 MW of thermal and IRR generation
 - 1,666 MW of IRR generation loss from 14 solar facilities
 - 853 MW of thermal generation loss (N. Edinburg and OECCS)
- System Frequency declined to 59.706 Hz and recovered to 60 Hz in 1 min 20 sec
 - 1,227 MW of RRS deployed
 - 1,116 MW of Load Resources deployed
- Categorized as NERC Cat 3 event (gen loss > 2000 MW)

ERCOT IBR Task Force Priorities and Next Steps

- 1) Coordinate with Generators to correct known issues on units (and equipment types) that tripped or derated during Odessa Disturbance**
- 2) Publish an Interconnection Questionnaire/Guideline for the first phase of process and develop field verification prior to energization**
- 3) Follow up on any grid disturbance > 100 MW loss**
- 4) Update generator models for any units that experienced performance issues, whether a fix was made or not - to reflect actual performance.**
- 5) Draft appropriate rule changes to address Odessa Disturbance recommendations**

Latest WECC/NERC Report on IBR Events

- **Similar problems are recurring involving failure to ride through low voltages following transmission disturbances**
- **Issues thought to be addressed showed up in newer facilities' equipment**
- **Lack of data adequate for analysis continues in some locations**
- **Reinforce previous event reports' recommendations**




Multiple Solar PV Disturbances in CAISO

Disturbances between June and August 2021
Joint NERC and WECC Staff Report

April 2022

RELIABILITY | RESILIENCE | SECURITY



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NERC Guidelines

NERC IBR Subcommittee (IBRS):

- Whitepapers, guidelines, references

- Follow-up on disturbances

- Coordination among OEM's, developers, transmission utilities and regulators

- Standard Authorization Requests



IBR-related Standards Projects

- 2020-06 Modifications to MOD-026 and MOD-027
- 2021-01 Modifications to MOD-025 and PRC-019
- 2021-02 Modifications to VAR-002
- 2021-04 Modifications to PRC-002
- 2021-07 Modifications to EOP-011, IRO-010, TOP-003, EOP-011, PRC-006, and PRC-010
- 2022-02 Modifications to TPL-001 and MOD-032

The NERC IBR Subcommittee (IBRS) is working on additional SARs among other workplan items.

Questions

