Arctic Weather Event

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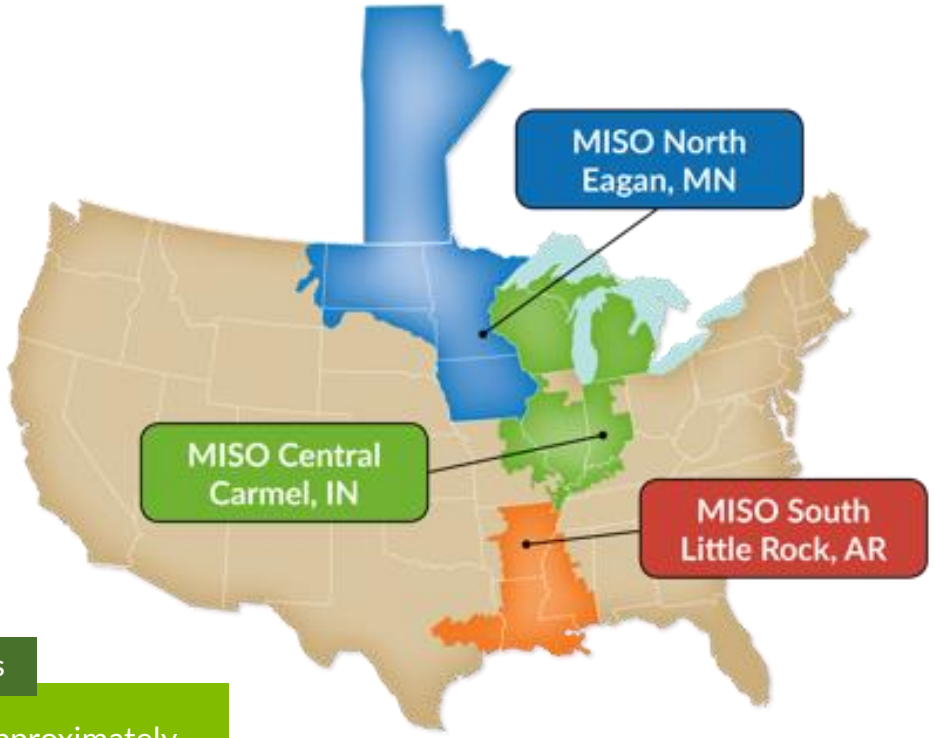
MISO is responsible for delivering safe, reliable and economic power across the high-voltage electric transmission system

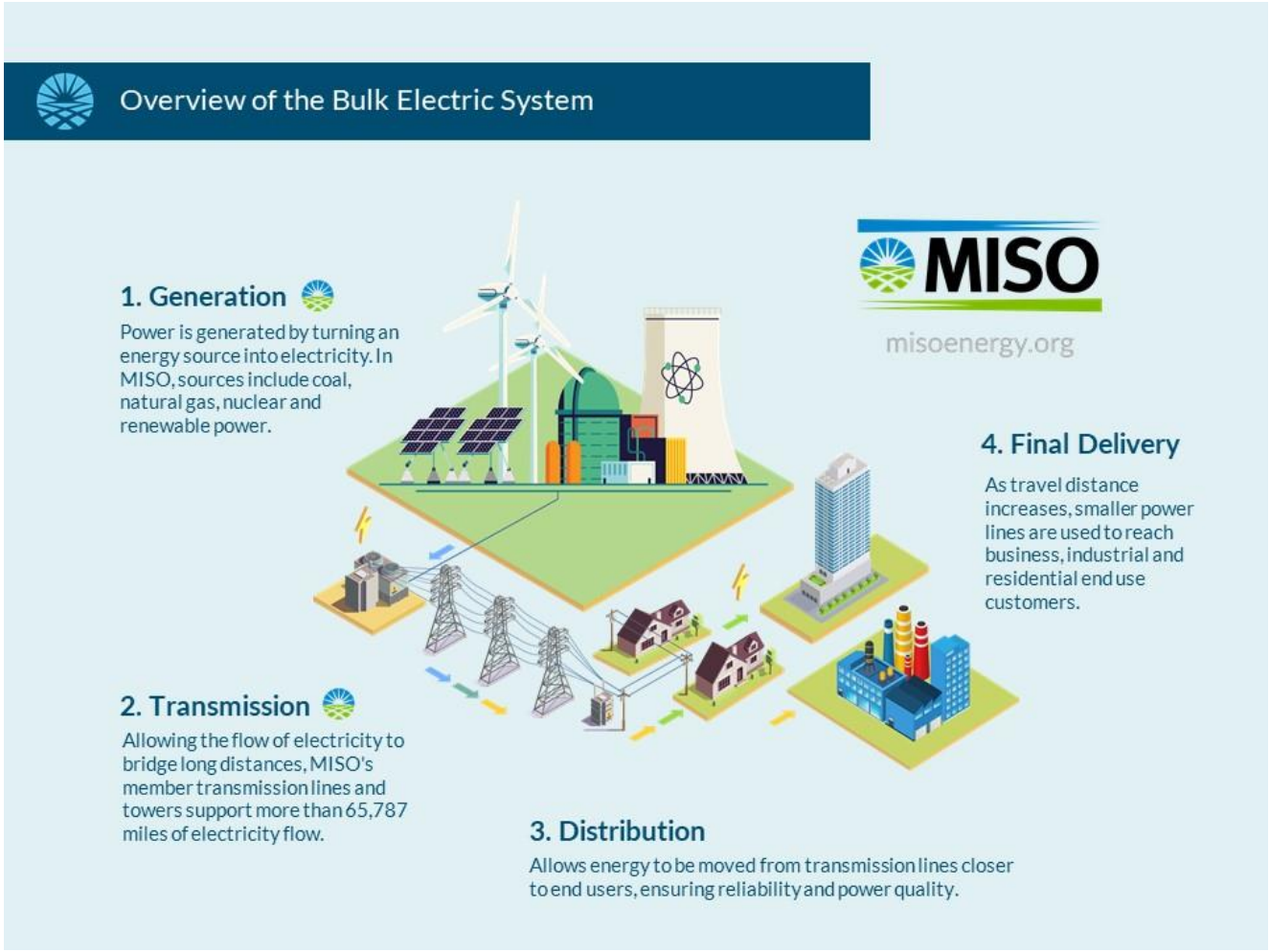
- 15 states and one Canadian Province
- 42 million end-use customers
- 175,000 MW* of generation
- 65,800 miles of transmission lines
- ~ 180 members
- ~ 471 market participants



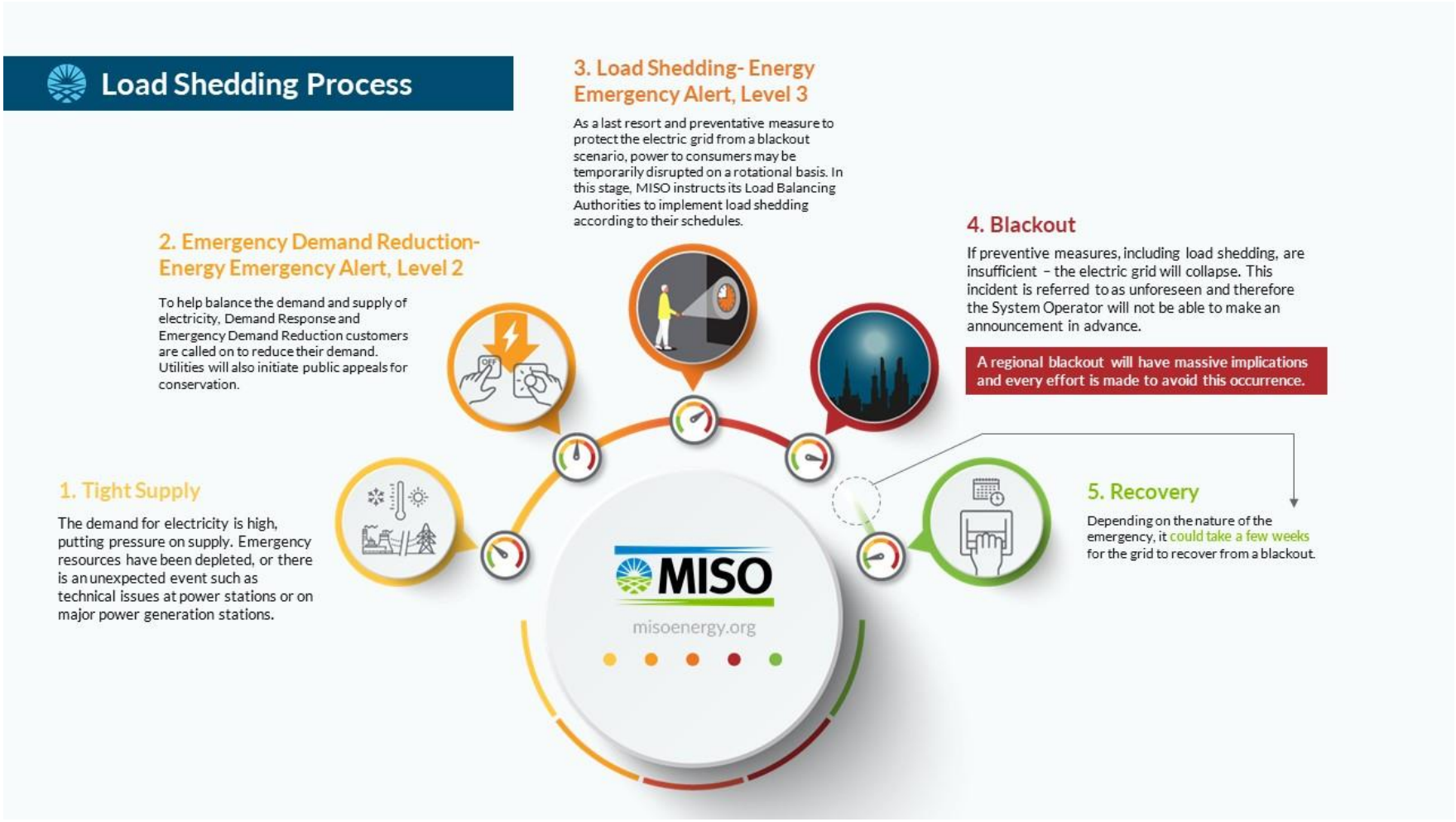
QUANTITATIVE **BENEFITS**

MISO provides approximately **$3.5 billion in annual benefits** to members

MISO's Role as Reliability Coordinator



What is load shed and how/when does it occur?



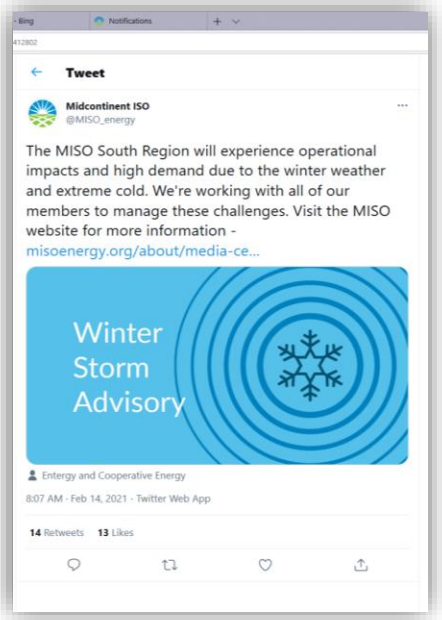
Communication Timeline

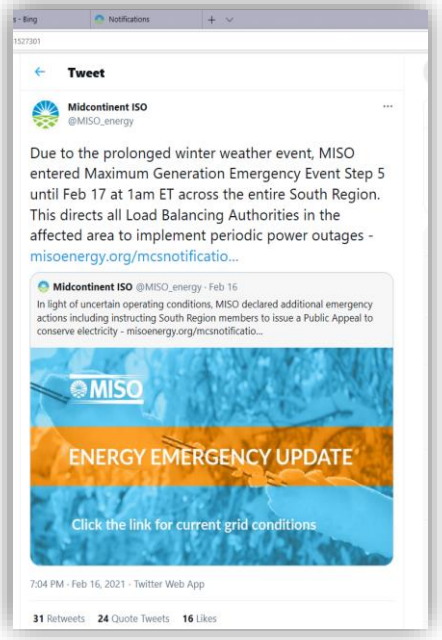
<u>February 13-15</u>

02/13/2021 00:00 EST Cold Weather Alert
02/14/2021 12:00 EST Conservative Operations
02/15/2021 09:00 EST MISO Capacity Advisory for the South Region
02/15/2021 07:00 EST MISO South Region Max Gen ALERT
02/15/2021 18:00 EST South Region Max Gen Warning
02/15/2021 18:00 EST Max Gen Event - EEA 2
02/15/2021 18:00 EST MISO is EXTENDING Max Gen Event - EEA 2

<u>February 16-17</u>

02/16/2021 00:00 EST MISO South Region Max Gen Warning
02/16/2021 08:00 EST Max Gen Event - EEA 2
02/16/2021 07:30 EST North/Central Region Max Gen Event - EEA 1
02/16/2021 07:30 EST Max Gen Event 1b - EEA 1 for North/Central Region
02/16/2021 13:32 PM Extending South Region Max Gen Event - EEA 2
02/16/2021 14:00 EST North and Central Max Gen Termination
02/16/2021 18:35 EST Max Gen Event - EEA 2
02/16/2021 19:40 EST Max Gen Event - EEA 3 (Load Shed Notice)
02/16/2021 22:00 EST Max Gen Event - EEA 2
02/17/2021 00:00 EST Max Gen Event - EEA 0





MISO's Emergency Actions

General Guide to MISO's Emergency Operations Messaging

MISO's Emergency Operations messages define the area(s) involved, duration, and projections of system conditions. The table below is a summary, and does not replace or redefine MISO's Emergency Operations messages.

Message	Communication Intent	Potential Member/MISO Actions
Conservative Operations Declaration	**Alert for Situational Awareness:** Reliability issue possible for defined area.	• Potentially suspend transmission maintenance • Review outage plans for deferral, cancellation
Hot Weather, Cold Weather or Severe Weather Alert	**Alert for Situational Awareness:** MISO could be approaching tight supply conditions.	• Review outage plans for deferral, cancellation
Capacity Advisory	**Advisory for Situational Awareness:** Potential for limited operating capacity margins (<5%) in the next 2-3 days.	• Update facility and generation outages, including de-rates • Update generation offers • Update Load Forecast Values • Update LMR Availability and Self Scheduled MW values • Update EDR offers
Min Gen Alert	**Alert for Situational Awareness:** MISO is forecasting a potential supply surplus.	• Prepare for de-commitment (taking generation off line), reduction in purchases or other actions
Max Gen Alert	**Alert for Situational Awareness:** MISO is forecasting a potential capacity shortage.	• Declare Conservative System Operations • Prepare for possible Max Gen Event
Max Gen Warning	**Warning to Prepare for Possible Event**	• Curtail non-firm exports • Schedule all available external resources into the MISO Market • Implement Emergency Pricing Offer Tier 1. This is an ex-post pricing change, and does not affect system commitment or dispatch.
Max Gen Event (Step 1)	**Actions Taken to Preserve Operating Reserves:** NERC Emergency Alert 1	• All available resources in use • Generators instructed to start off-line resources. • Use of reserves not yet implemented. • Emergency Pricing Offer Tier 1 is still effective.
Max Gen Event (Steps 2, 3, 4)	**Actions Taken to Preserve Firm Load:** NERC Emergency Alert 2 (Step 3 declaration)	• Implement demand management programs • Utilize Contingency Reserves • Purchase Emergency Energy • Issue Public Appeals • Prepare for possible firm load shed • Implement Emergency Pricing Offer Tier 2. This is an ex-post pricing change, and does not affect system commitment or dispatch.
Max Gen Event (Step 5)	**Event Occurring:** NERC Energy Emergency Alert 3	• Shed firm load • Rolling brownouts or blackouts for defined area • Emergency Offer Tier 2 is still effective.