The background of the slide is a composite image. The upper portion shows a landscape with several wind turbines silhouetted against a bright, hazy sky where the sun is low on the horizon. The lower portion shows a close-up of solar panels. The overall color palette is a mix of warm yellows and oranges from the sun, and cool blues and purples from the sky and foreground.

Technical Analysis of a 100% Renewable  
or Clean Energy Standard Requirement  
for Vermont Distribution Utilities:  
***Stakeholder Advisory Group Meeting 3***

August 31, 2023

# Proposed Scenarios & Sensitivities: PSD Scenarios, influenced by SAG and Polling Preferences

| Scenarios →<br>Design Element ↓ |                     | BAU  | S1: 100% RES | S2: 100% RES, incl.<br>Regional Tier | S3: 100% CES | S4: 100% CES, incl.<br>Regional Tier |
|---------------------------------|---------------------|------|--------------|--------------------------------------|--------------|--------------------------------------|
| Tier I, Net                     | Target              | 65%  | 70%          | 40%                                  | 70%          | 40%                                  |
|                                 | Target Date         | 2032 | 2035         | 2035                                 | 2035         | 2035                                 |
|                                 | Eligibility Changes | N/A  | None         | None                                 | Add nuclear  | Add nuclear                          |
| Tier II                         | Target              | 10%  | 30%          | 30%                                  | 30%          | 30%                                  |
|                                 | Target Date         | 2032 | 2035         | 2035                                 | 2035         | 2035                                 |
|                                 | Eligibility Changes | N/A  | None         | None                                 | None         | None                                 |
| Regional Tier                   | Target              | N/A  | N/A          | 30%                                  | N/A          | 30%                                  |
|                                 | Target Date         | N/A  | N/A          | 2035                                 | N/A          | 2035                                 |
|                                 | Eligibility*        | N/A  | N/A          | 2010+                                | N/A          | 2010+                                |

## Sensitivities:

- Tier II Targets\*: 10%, 20%, 30% by 2035
- Regional Tier Targets\*: 20%, 30%, 40% by 2035

\* Tier I: set as remainder after Tier II and Regional Tier are defined



# Proposed Scenarios & Sensitivities: SAG Scenarios – select 2 out of 4

| Scenarios →<br>Design Element ↓ |                      | Option 1       | Option 2                       | Option 3                    | Option 4                       |
|---------------------------------|----------------------|----------------|--------------------------------|-----------------------------|--------------------------------|
| Tier I, Net                     | Target               | 50%            | 40%                            | 80%                         | 40%                            |
|                                 | Target Date          | 2035           | 2035                           | 2035                        | 2035                           |
|                                 | Eligibility Changes* | Remove biomass | Remove biomass                 | Add nuclear; remove biomass | Add nuclear; remove biomass    |
| Tier II                         | Target               | 20%            | Combined with<br>Regional Tier | 20%                         | Combined with<br>Regional Tier |
|                                 | Target Date          | 2035           |                                | 2035                        |                                |
|                                 | Eligibility Changes  | None           |                                | None                        |                                |
| Regional Tier                   | Target               | 30%            | 60%                            | N/A                         | 60%                            |
|                                 | Target Date          | 2035           | 2035                           | N/A                         | 2035                           |
|                                 | Eligibility*         | 2010+          | 2010+                          | N/A                         | 2010+                          |

\* **Treatment of large hydro:** Achieve SAG’s hydro-related objectives by...

- (1) Including lower impact hydro in regional Tier (use CT Class I definition as a proxy), and
- (2) Limiting the overall % of sales met by Tier I (rather than limiting hydro by project size or location)

# Technical Analysis of a 100% Renewable or Clean Energy Standard: Draft Results Technical Workshop

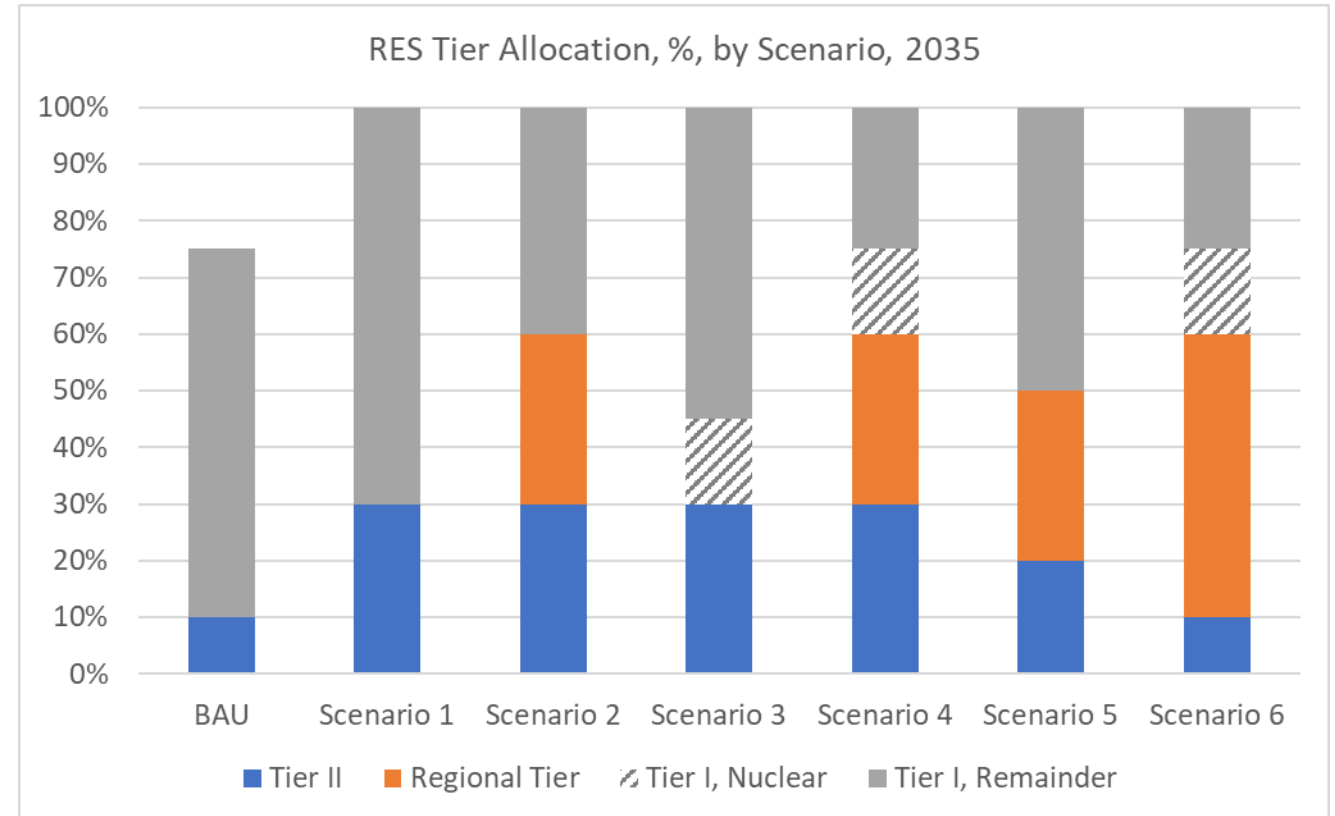
*October 10, 2023*

*Presented by: Sustainable Energy Advantage, LLC*

# Scenario Definitions

## Department and Stakeholder Feedback Yields 68 Cases

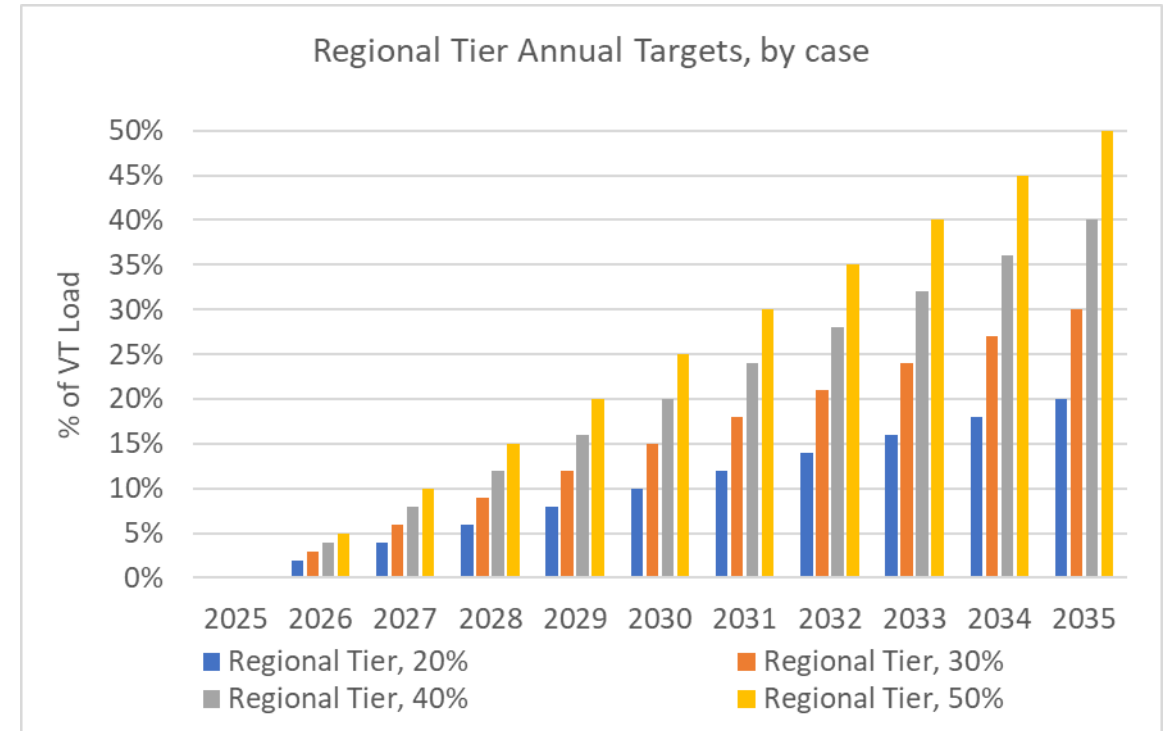
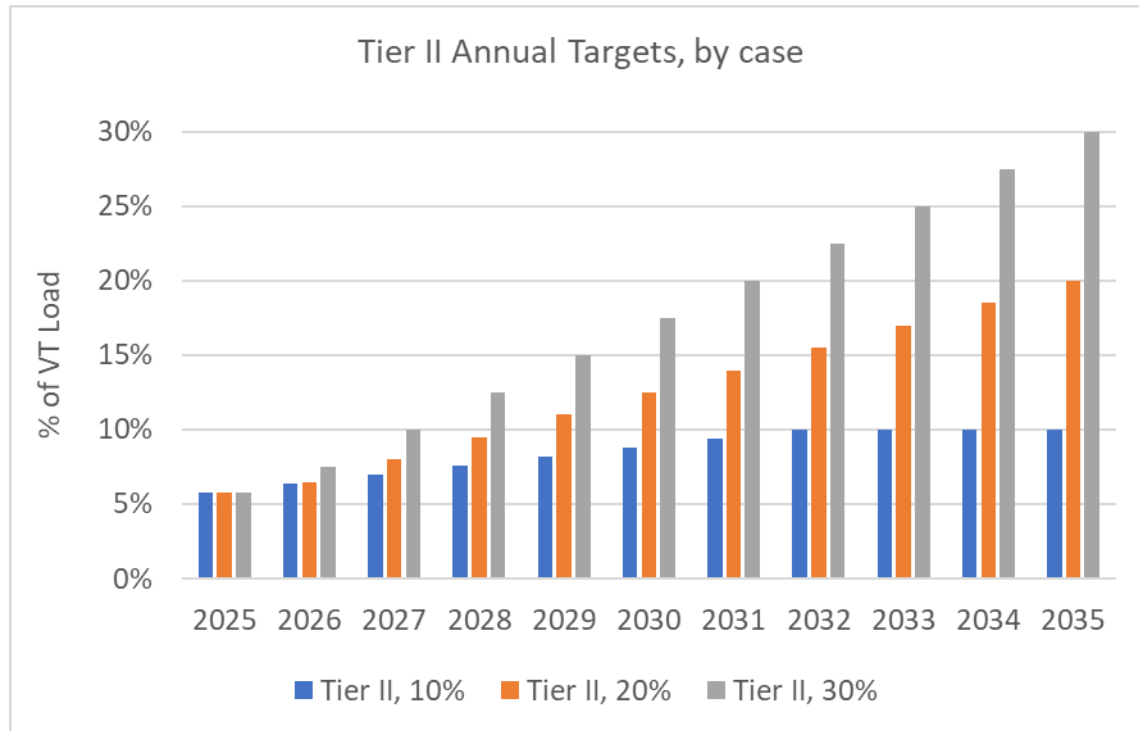
- BAU (Business as Usual): 75% by 2032
  - 10% Tier II
  - 65% Tier I
- Six core scenarios, varying:
  - Tier II: 10%, 20%, 30%
  - Regional Tier: 0%, 20%, 30%, 40%, 50%\*
    - \* Scenario 6 only, when combined with Tier I
  - Tier I, Net: Fills 'gap' to 100%... By 2030, with *reallocation of supply through 2035* as other Tiers increase
  - Tier I Eligibility:
    - With and without biomass
    - With and without nuclear
  - Load Forecasts
    - Base Case
    - Higher Electrification
- Result = BAU + 68 scenario variants



# Scenario Definitions:

## Annual Tier II and Regional Tier Targets

- Analysis requires assumption of annual targets, by Tier.
- Tier I fills the gap to 100% by 2030, and to maintain 100% thereafter



# Assumptions Applied to All Scenarios/Sensitivities (1)

- All targets reached by 2035
- RES-obligated load to include losses (required for a 100% target)
- CES defined as “Tier I with Nuclear eligible up to 15% of VT load” → intended to approximate current purchase volume *and* allow to additional purchases (to remain at 15% of load)
  - SEA has assessed nuclear production, existing contractual commitments, license expirations, and other state policies (e.g., MA CES-E and GGES) to arrive at conclusion that this assumption is feasible from an ‘availability of supply’ perspective.
- For ‘100% renewable utilities,’ Tier I, Tier II, and Regional Tier RES requirements will be applied to load above 2019 “baseline”
- Assumes import transactions are facility-specific and create NEPOOL GIS Certificates reflecting descriptive characteristics of applicable facilities (i.e., not system power)
- Alternative Compliance Payments
  - Tier I and Tier II: methodology unchanged
  - Regional Tier: same as Tier II

# Assumptions Applied to All Scenarios/Sensitivities (2)

- Regional Tier Supply-Demand Modeling Approach
  - Modeling simulates scenario-specific interaction between VT and all other New England RES/CES programs → results in Regional Tier supply/demand balance and price formation.
  - Results in assumed contracting/attribution of supply to Vermont based on facility-specific characteristics and state-by-state eligibility requirements
- Regional Tier Assumed Eligibility
  - All post-2010 solar and wind
  - Hydro currently certified in *any* regional Class I market
  - Biomass assumed ineligible



# Assumptions: Load

- Baseline: 2023 CELT
  - But CELT electrification forecast is conservative relative to state goals, so replaced by outlook relative to state targets
- Electrification: Reflects SEA forecasted impact of transportation and heating sector electrification

