



Survey of State RAP Use

RAP ETG Meeting

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- **Surveyed States 2007-2008**
 - **100% Response Rate**
 - **Determine Current State of The Art**
 - **Identify High RAP Users**
 - **Share Information Between States**
- **New Survey Underway**
 - **28 States Responded so far**



Questions

- **% RAP Allowed & Used**
 - Mix Type
- **Special Requirements**
- **Obstacles to Increasing Use**



Questions

- **Research Needs**
- **Experience with “High Percentage” Use**
- **Ownership of RAP**
- **Experience with Warm-Mix and RAP**

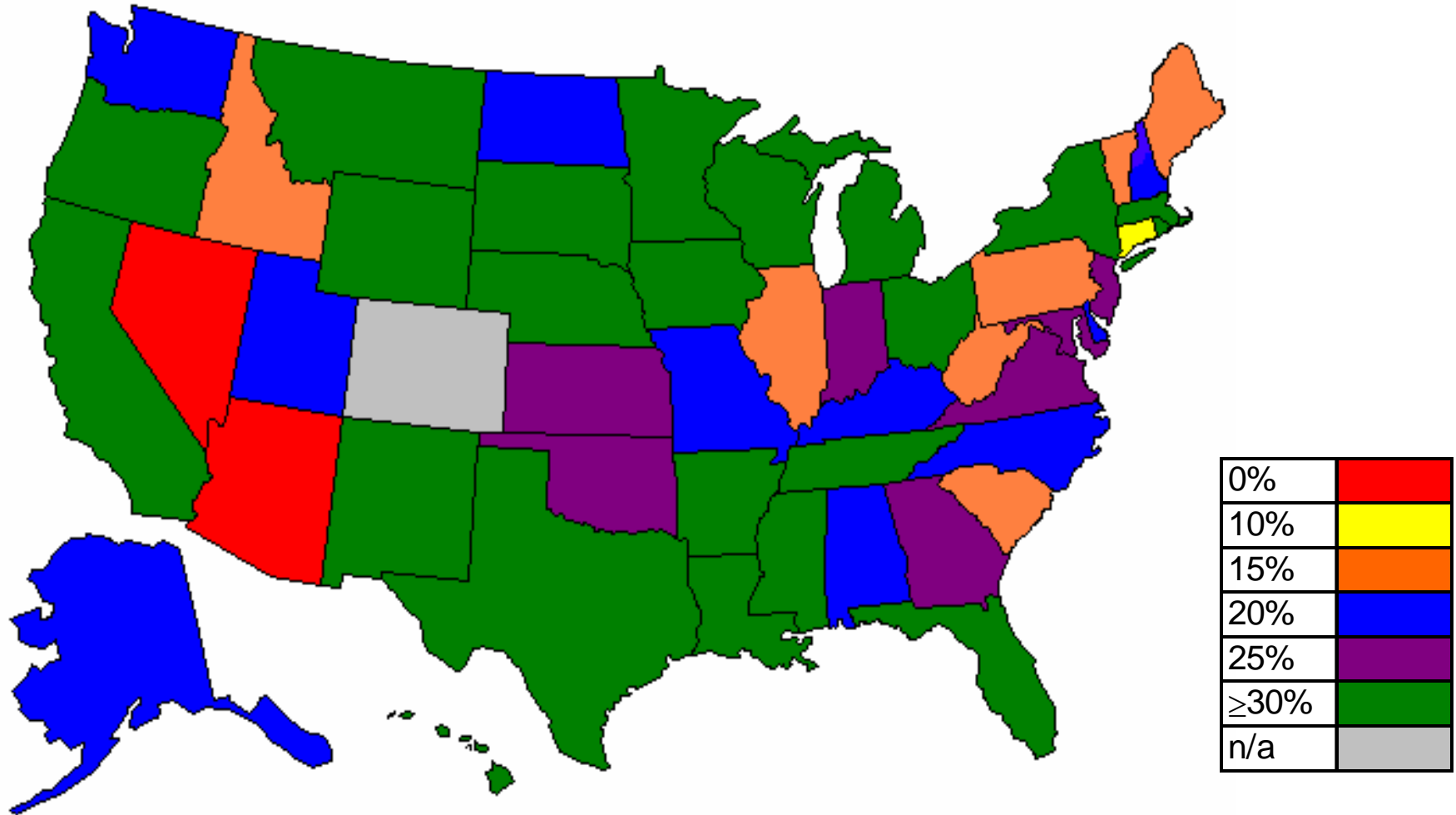


Preliminary Results

- **12 States Increased RAP Allowed**
- **Some Increased % Used**
 - **6 Base Mixes**
 - **6 Intermediate Mixes**
 - **6 Surface Mixes**
- **High RAP/WMA Experience in 4 States**

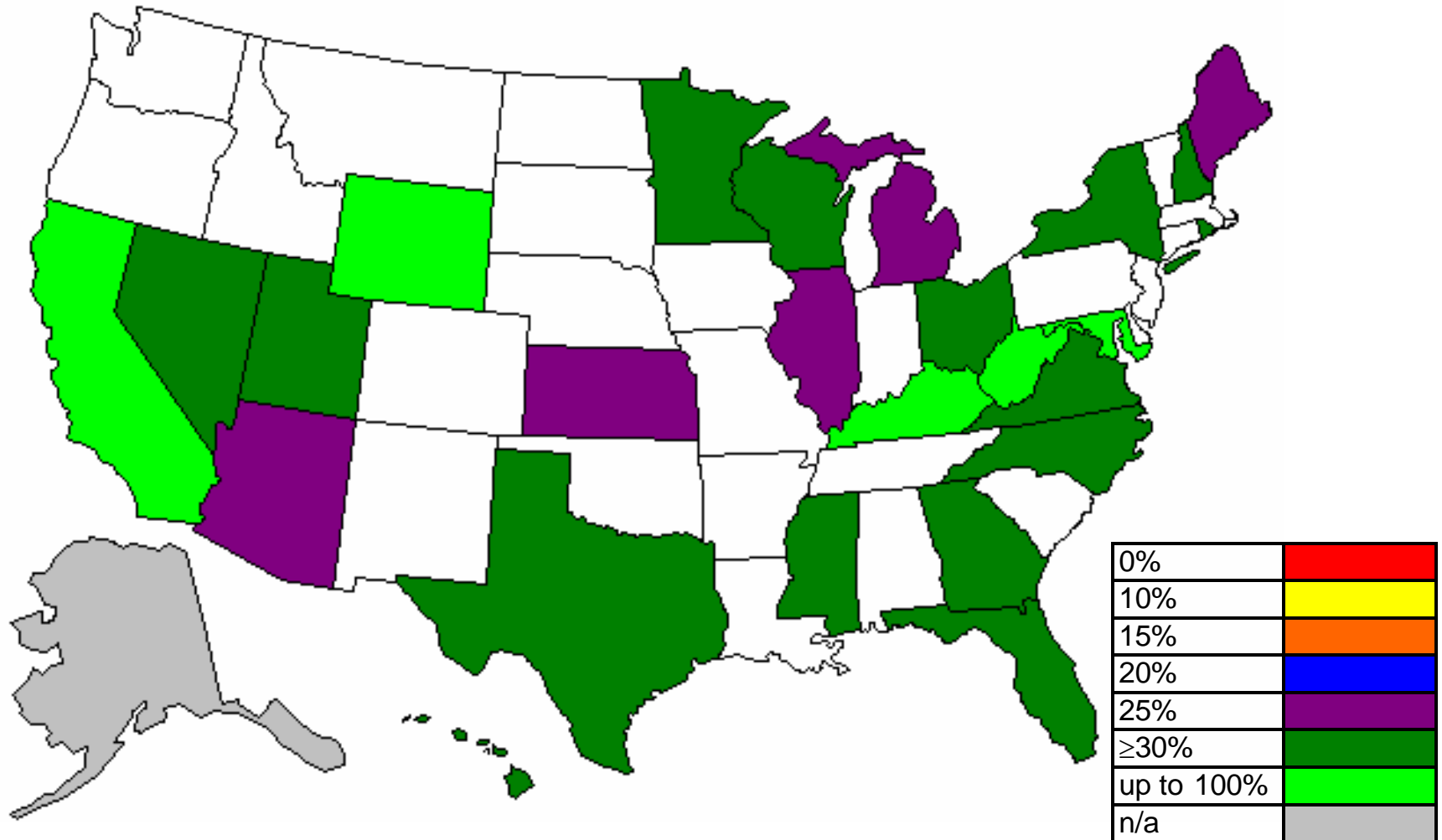


Base Mixes -- Allowed



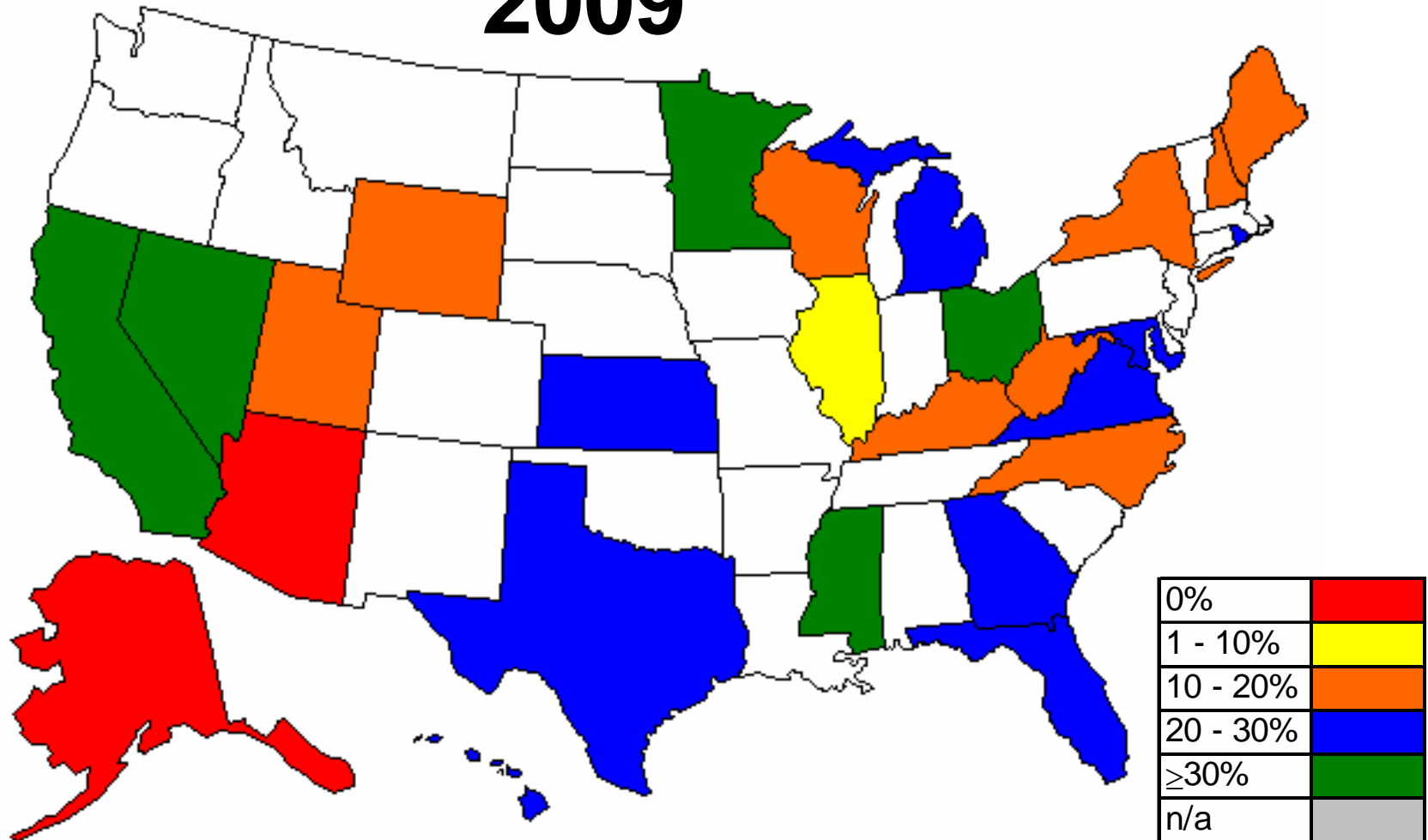


Base Mixes – Allowed 2009



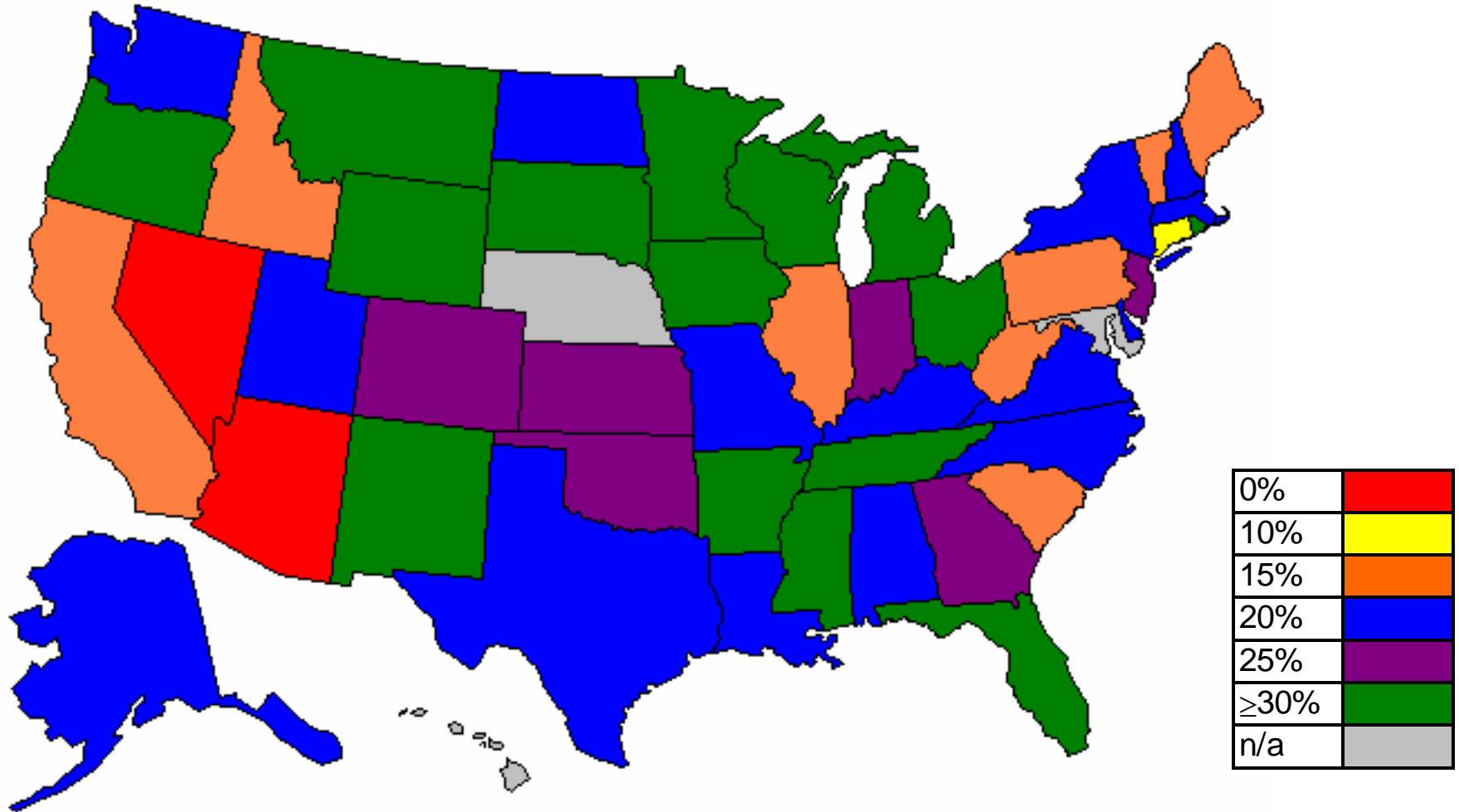


Base Mixes -- Average Use 2009



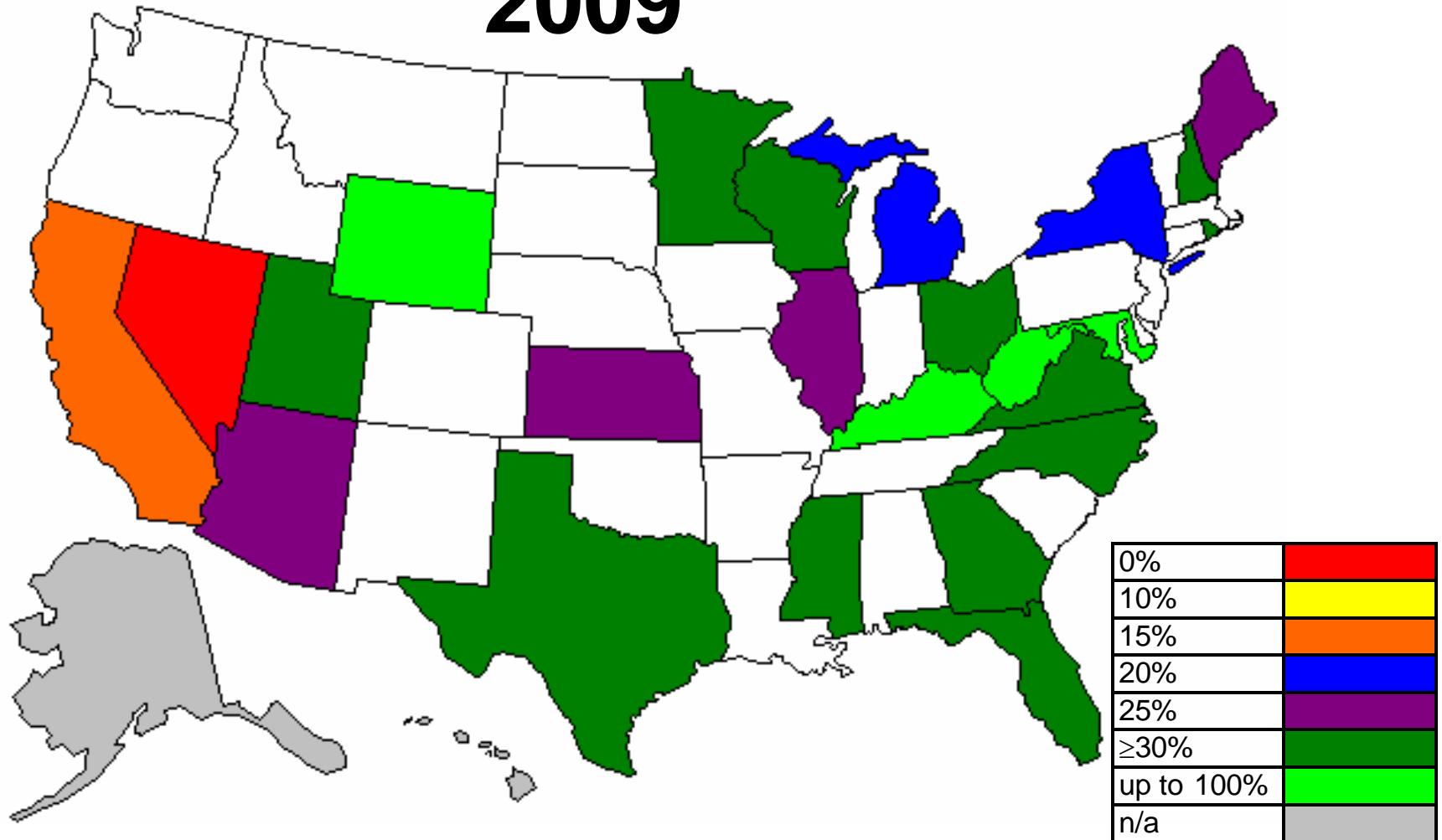


Intermediate Mixes -- Allowed



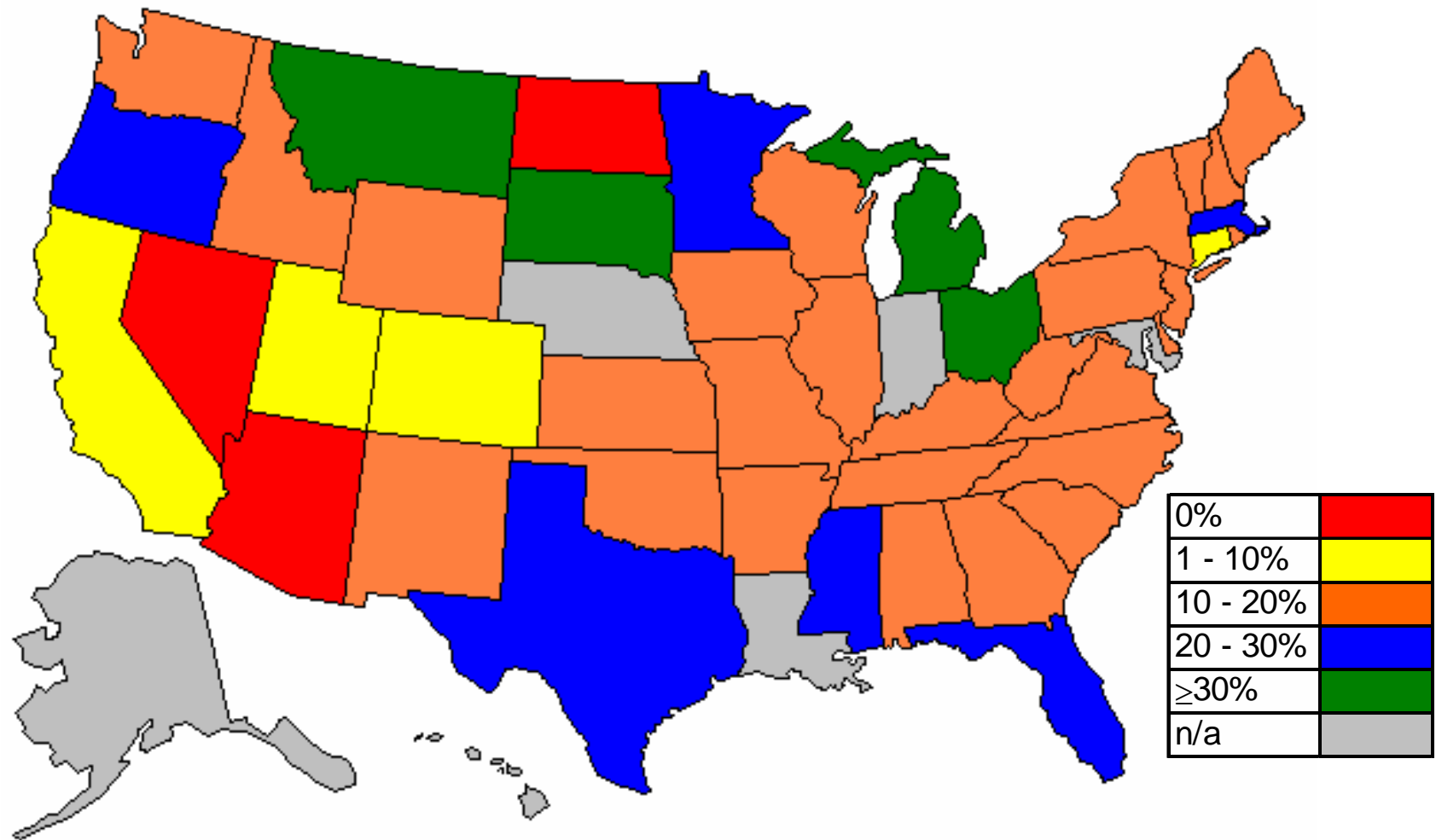


Intermediate Mixes – Allowed 2009



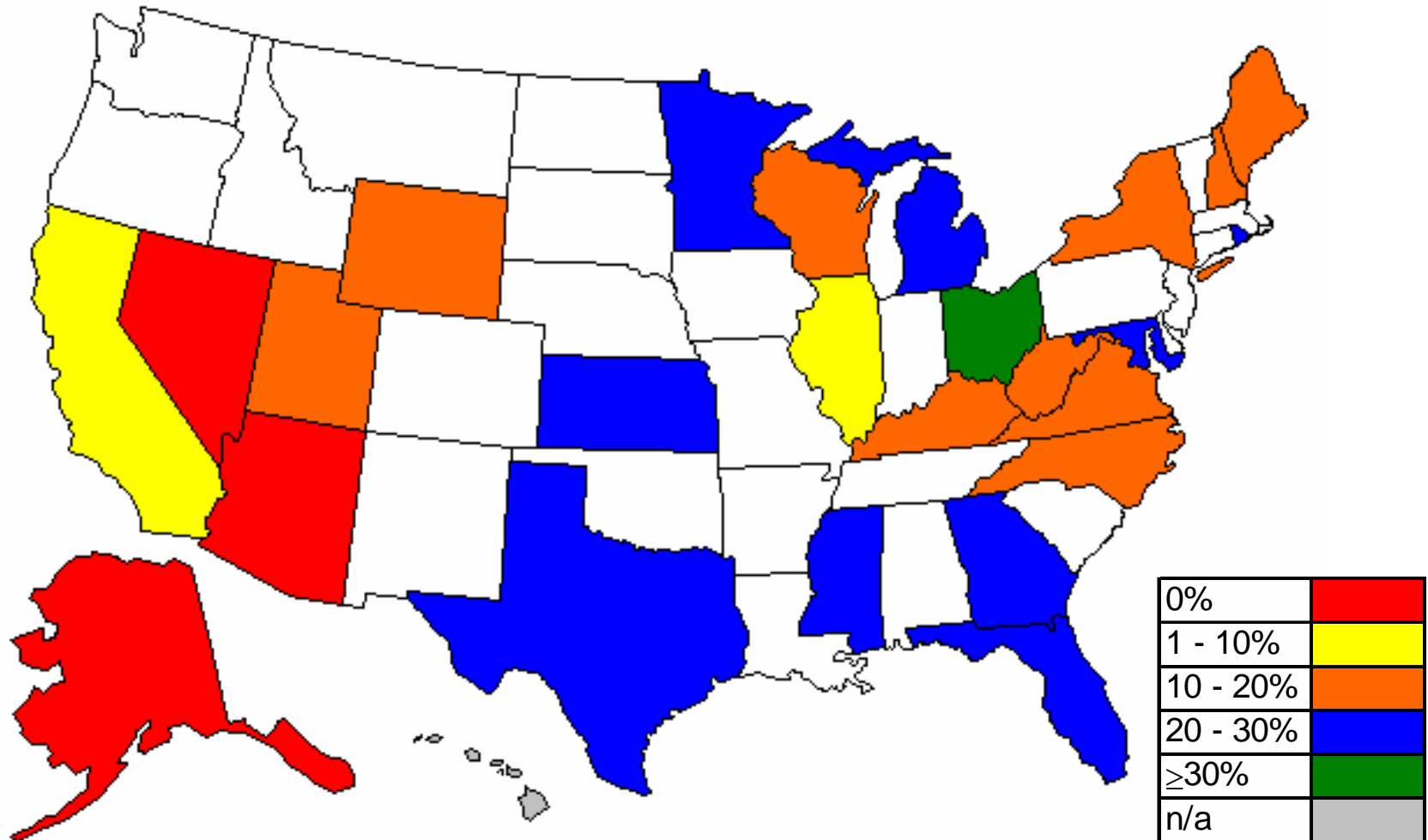


Intermediate Mixes -- Average Use



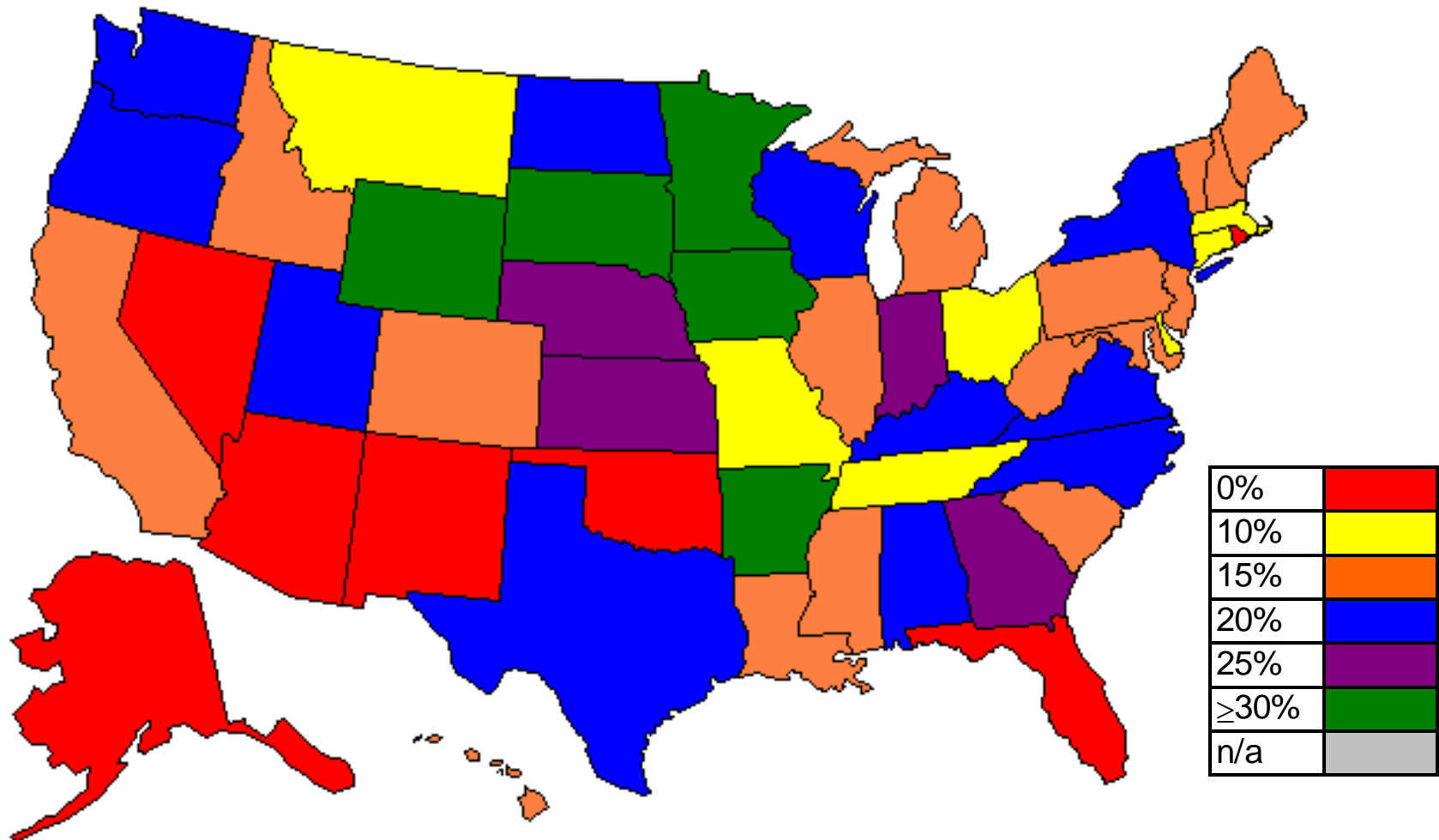


Intermediate Mixes -- Average Use 2009



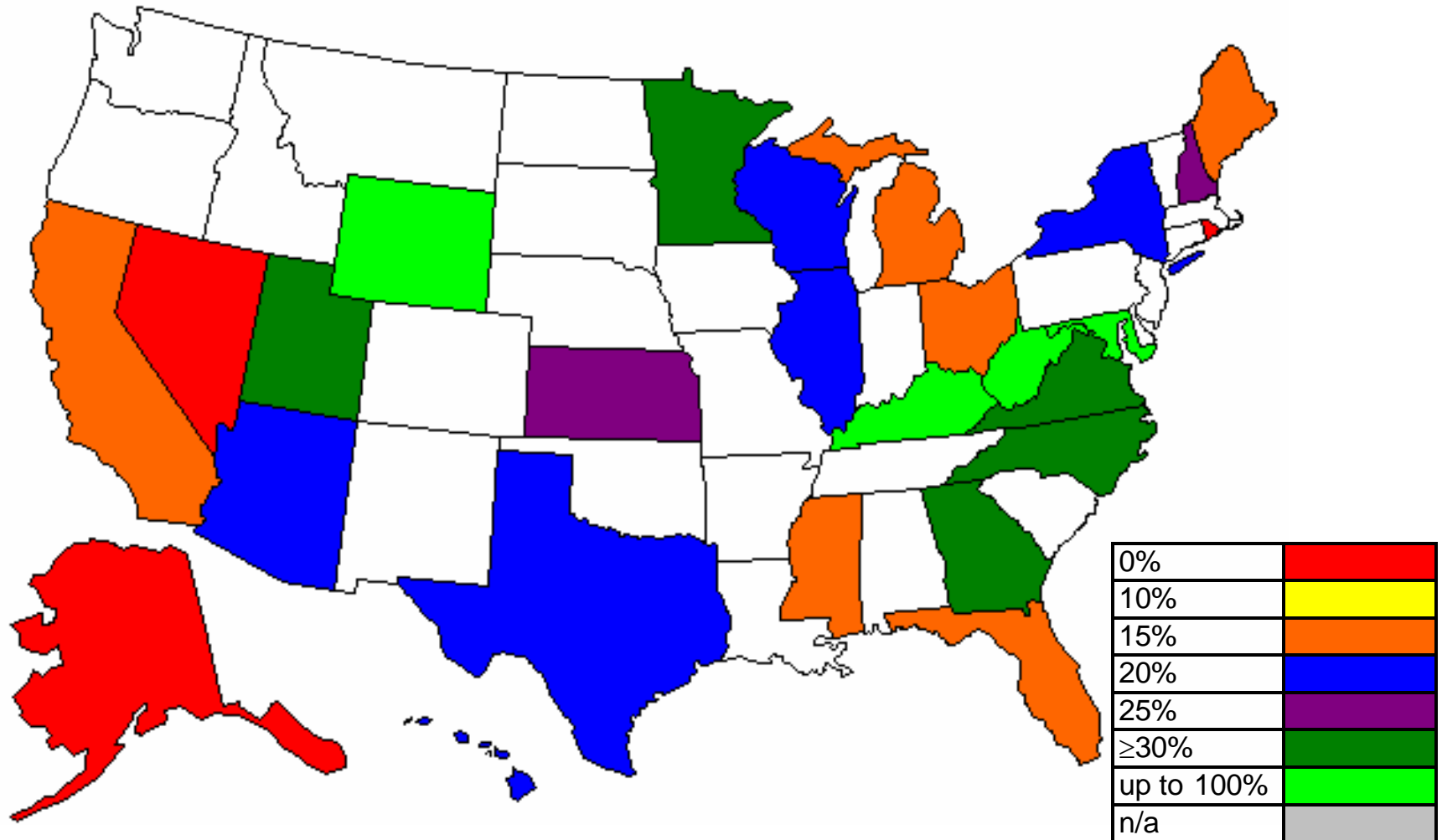


Surface Mixes -- Allowed



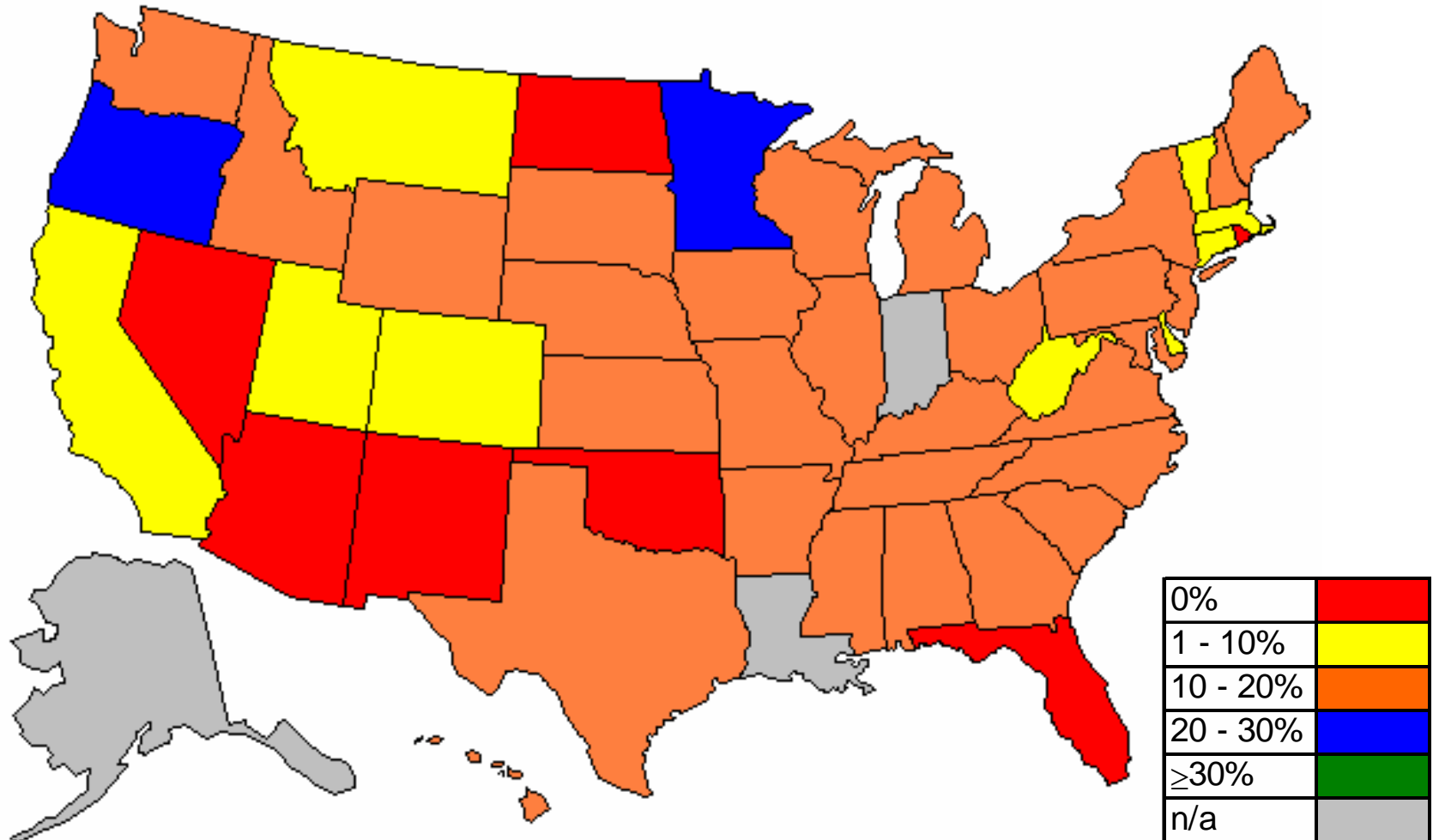


Surface Mixes – Allowed 2009



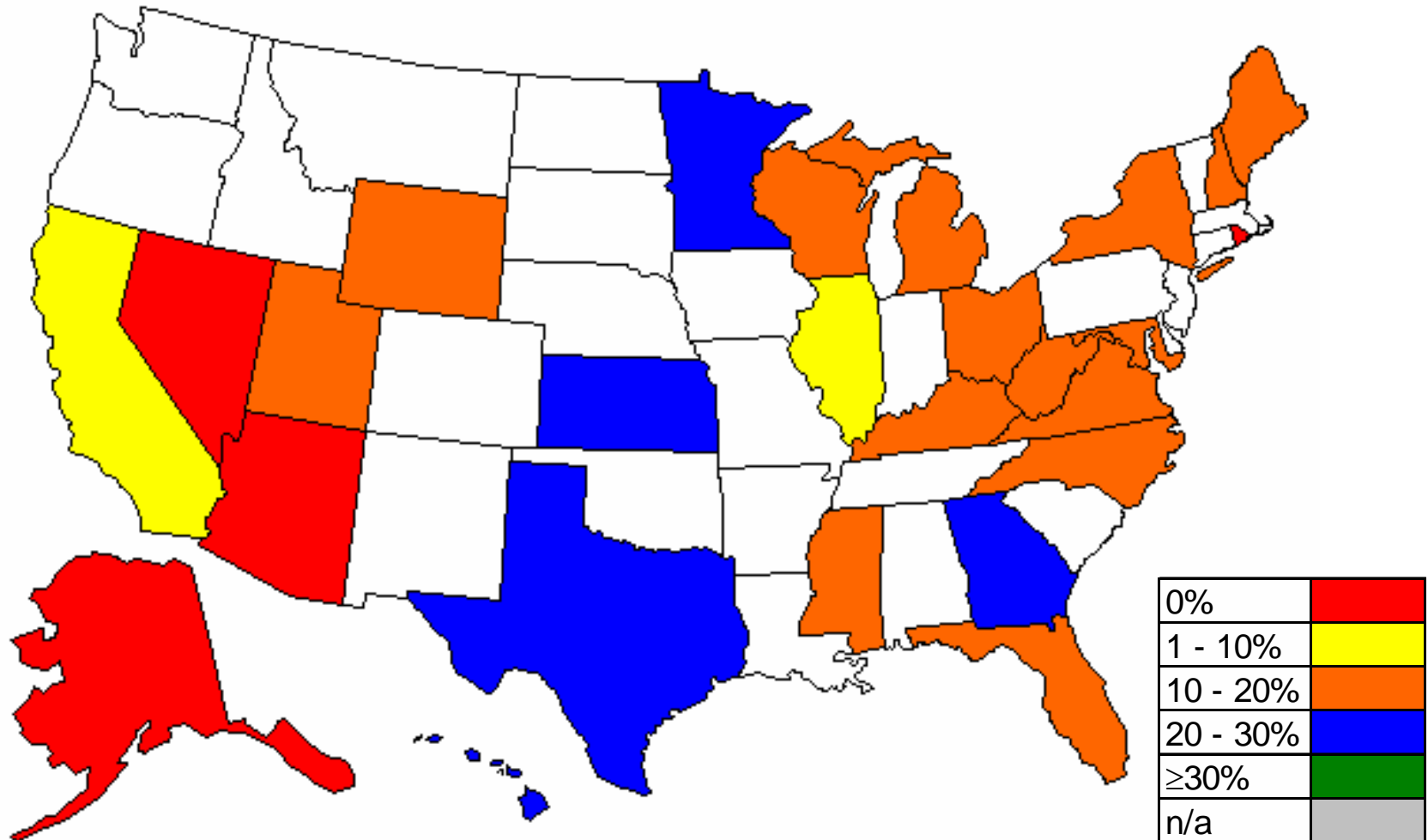


Surface Mixes -- Average Use





Surface Mixes -- Average Use 2009

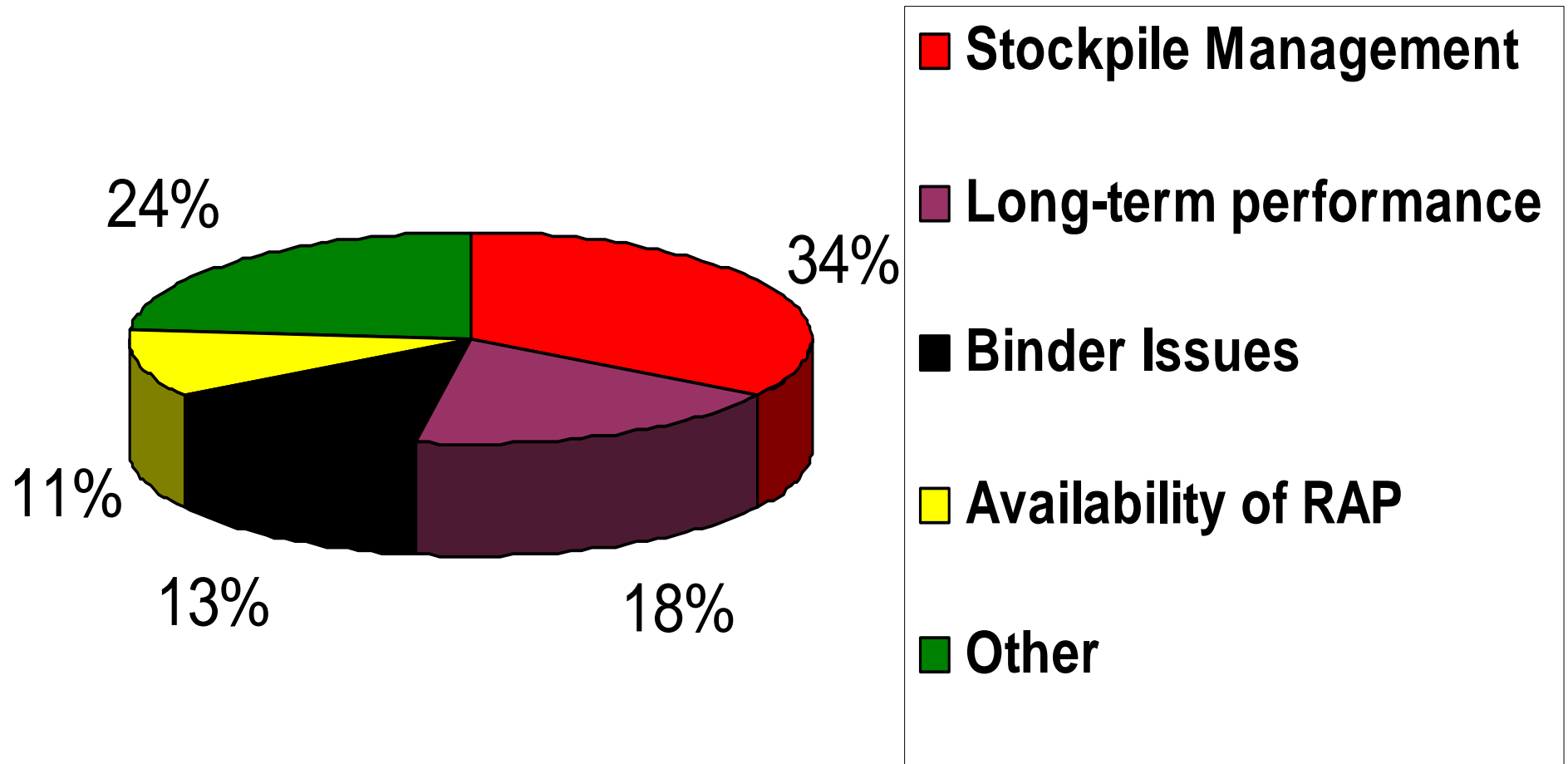




Barriers to Increasing RAP Use

- **Surveyed AASHTO Subcommittee on Materials**
- **One Question**
- **What is the major barrier to your state increasing the use of RAP in HMA?**
- **Response from 43 States**

Barriers Identified





Barriers

- **Stockpile Management - 34%**
 - **Quality of original stone**
 - **Gradation Control**
 - **Origin of Material Unknown**
 - **Processing Requirements**
 - **Additional Testing**



Barriers

- **Long Term Performance – 18%**
 - **Durability Questions**
 - **Additional Testing Requirements**
 - **Variability of RAP Mixes**
 - **Unknown Performance Characteristics**
 - **Lack of Performance Test**
 - **“Could” Have Early Failure**



Barriers

- **Binder Issues – 13%**
 - **Bumping Grade**
 - **Properties of Final Blend**
 - **Compaction Issues**
 - **Additional Tank Required**
 - **Lower Grade not Available/Expensive**



Barriers

- **Availability of RAP – 11%**
 - **Use in Base or Shoulders (unbound)**
 - **Used by Maintenance**
 - **Concern about moisture**
 - **Too contaminated**
 - **Cannot Meet Gradation Requirements**



Barriers

- **Other – 24%**
 - **Contractor Unwilling to Use**
 - **Lack of Experience**
 - **Existing Specifications**
 - **Resistance of Pavement Designers**
 - **Research Did Not Support Performance**



Other Barriers

- **Resistance to Change**
- **Perceptions**
 - **Less Quality**
 - **Industry Can't Do It**
 - **Value Not Shared**
 - **Difficult to Evaluate**



Other Barriers

- **Low Risk Tolerance**
 - **It Might Fail**
 - **Current System is Working**
 - **More Research Needed**



Future Plans

- **100% Response Rate**
- **Identify States that Changed**
- **Identify Potential States to Contact**
- **Identify Knowledge Gaps**
- **Document Successes**
- **Keep Beating the Drum**