2008 Residential Building Standards Project

Revision to the Residential ACM
Calculation for Slab Heat Flow

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Agenda

- Background

- CEC Slab Loss Model

- Residential ACM Proposal

- Impact on TDV for typical homes

- Impact on Slab Insulation Savings

Background

- The Residential ACM specifies the rules and algorithms to be used in compliance Calculations

- Slab edge insulation required only in Zone 16 (mountains)

- Default slab is 80% carpeted and 20% hard surface

- 2005 ACM specifies conductance based on ASHRAE F2 to monthly ground temperature

- Does not give enough credit for slab edge insulation and overestimates cooling heat losses

CEC Slab Loss Model

○ Developed in 2000 by Huang et. Al. at LBNL

○ Simplified model for hourly simulation

  ● Based on results of detailed 2D model

  ● Regression coefficients for conductance to annual, monthly and weekly temperatures

  ● Carpeted and hard surface slabs

  ● Implemented in DOE2
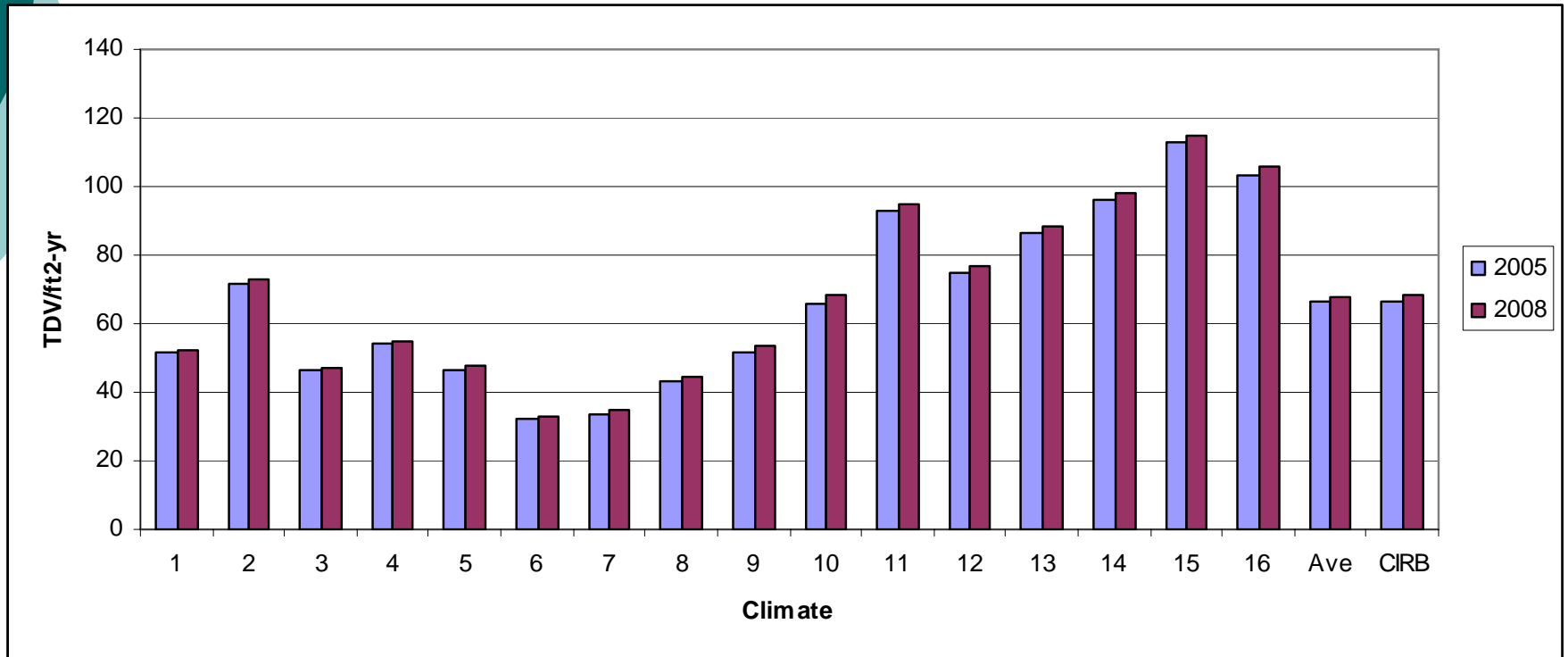
Proposal for Residential ACM

- Keep current slab inputs

  - Area carpeted and hard surface

  - Perimeter length of each

- Add input for slab edge insulation

  - Location/type

  - R and depth of insulation
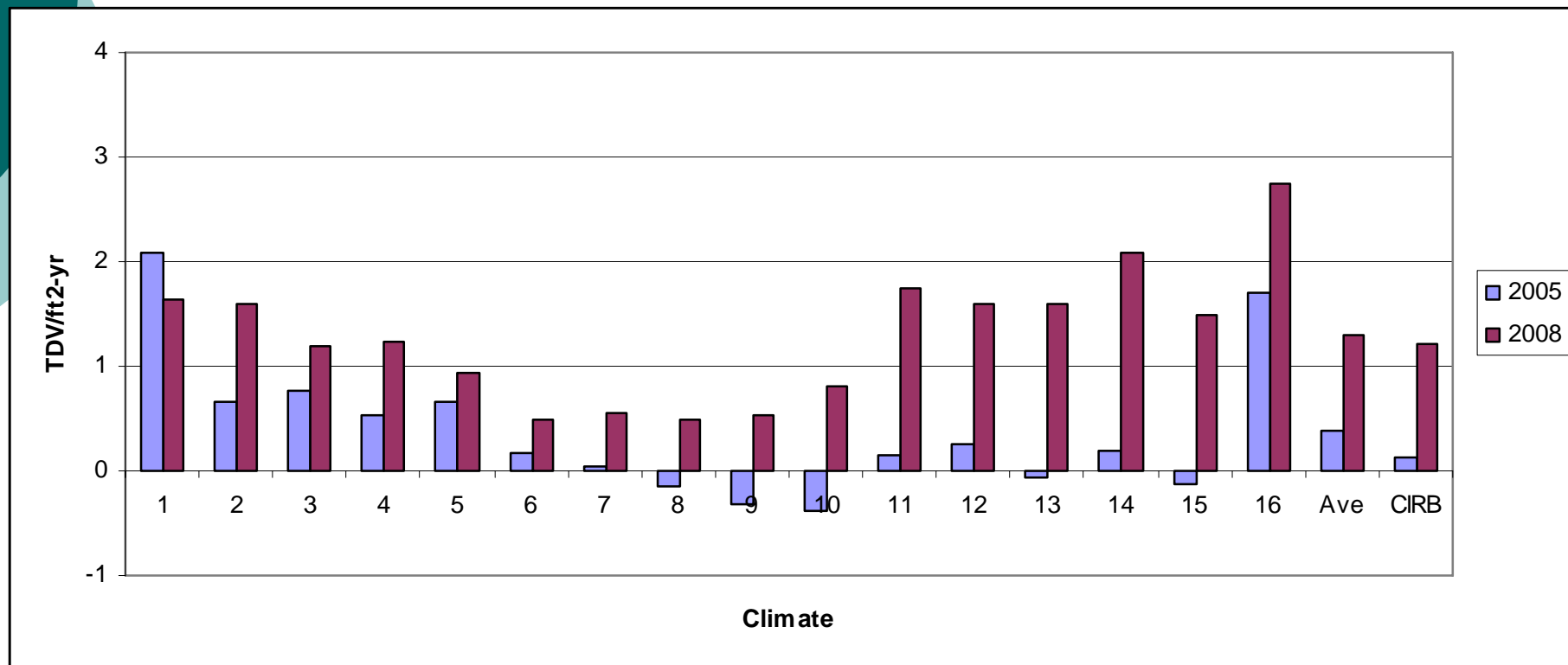
Coefficients for defined cases

Type	Carpeted					Exposed				
	Perim Week	Perim Month	Perim Year	Core Month	Core Year	Perim Week	Perim Month	Perim Year	Core Month	Core Year
R0	0.1157	0.0664	0.0028	0.0517	0.0257	0.2042	0.0797	0.0014	0.0550	0.0258
R5 2'	0.0320	0.0869	0.0103	0.0390	0.0310	0.0639	0.1001	0.0087	0.0421	0.0304
R10 2'	0.0205	0.0874	0.0131	0.0363	0.0322	0.0441	0.1005	0.0116	0.0395	0.0314

User selects type from library
ACM Interpolates for R
    ACM Interpolates for depth

Uninsulated Slab Annual TDV Increases 2%

Slab Insulation TDV Savings Increases

Conclusion

○ Proposed Model

- Works with current inputs

- Covers current prescriptive requirements

- Offers path for future credits for slab insulation

- Has minimal impact on compliance for current homes