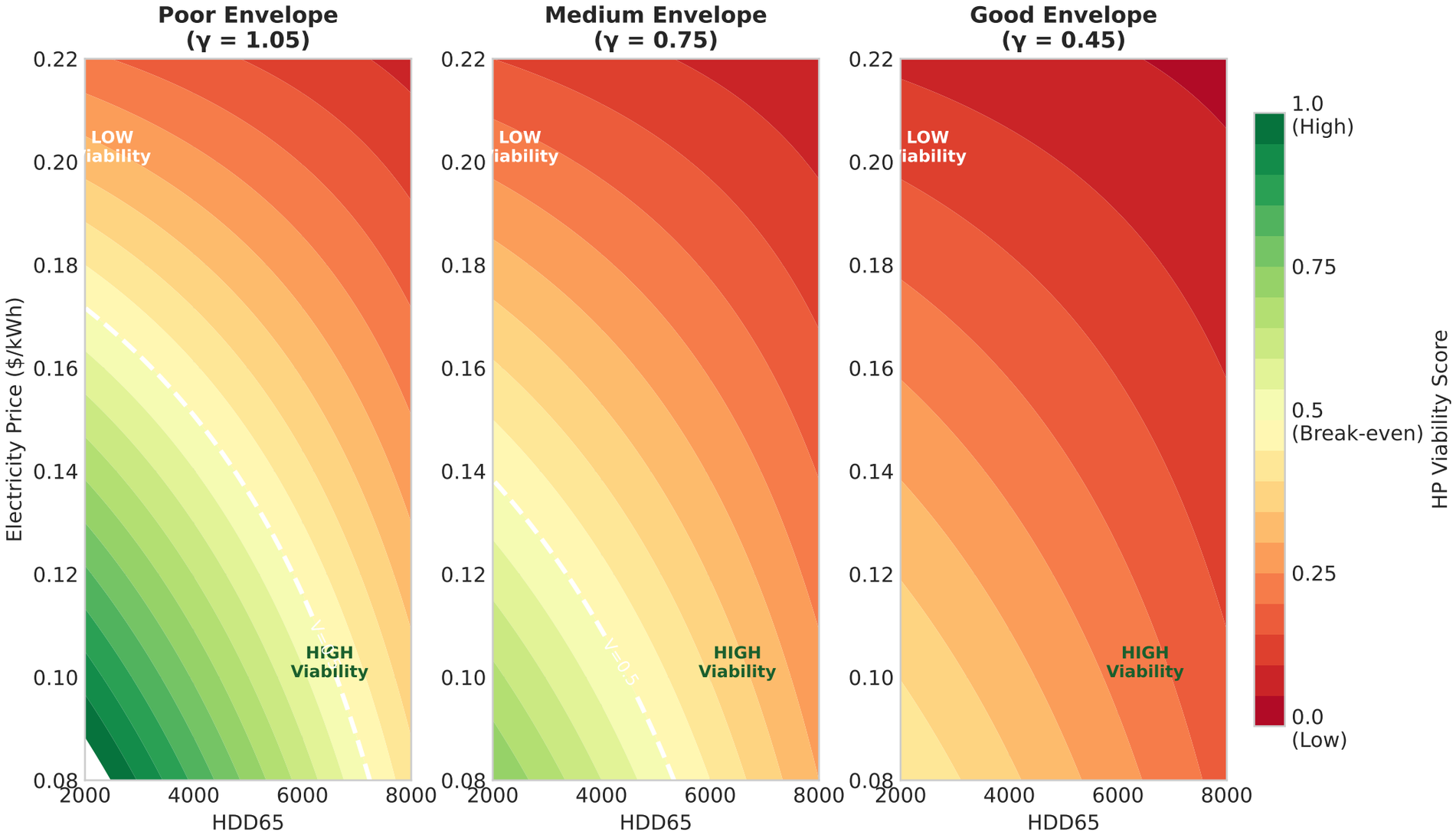
Figure 9: Heat Pump Viability Score – Tipping Point Analysis
(White dashed line = V = 0.5 threshold, calibrated to NPV ≈ 0 @ 15 years)



HP Viability Score (V)

$$V = (1 - \alpha \cdot H^*)(1 - \beta \cdot P^*) \cdot \gamma$$

Parameters:

$H^* = (HDD - 2000) / 6000$
$P^* = (price - 0.08) / 0.14$

$\alpha = 0.6$ (climate weight)
$\beta = 0.8$ (price weight)
γ = envelope factor

Calibration:

α, β calibrated to match Pareto results (Fig. 8)

V = 0.5 corresponds to NPV ≈ 0 at 15 years under central assumptions

Interpretation:

V > 0.5 → HP Viable
V = 0.5 → Break-even
V < 0.5 → HP Not Viable

White line = tipping point