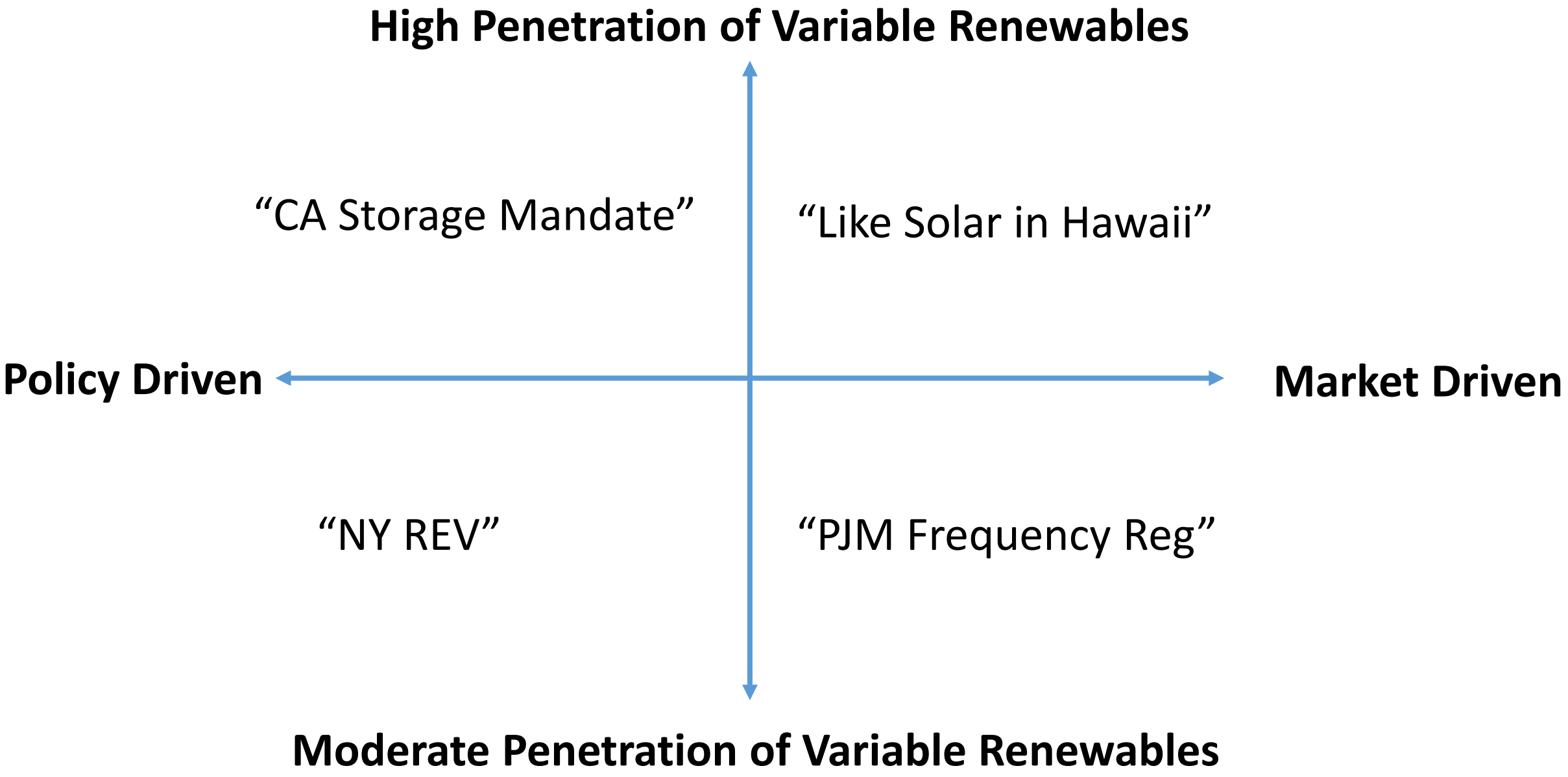
High Penetration of Energy Storage Update

- Held Working Session – January 20th, 2016
  - Reviewed all prior input (including panel members)
  - Discussed and finalized drivers for candidate scenarios
  - Reviewed first draft outline of the paper
- Working Session Today – March 18th, 2016
  - Explore givens
  - Choose base scenarios
  - Refine draft outline
  - Launch work stream assignments
  - Targeting 2H-2016 completion

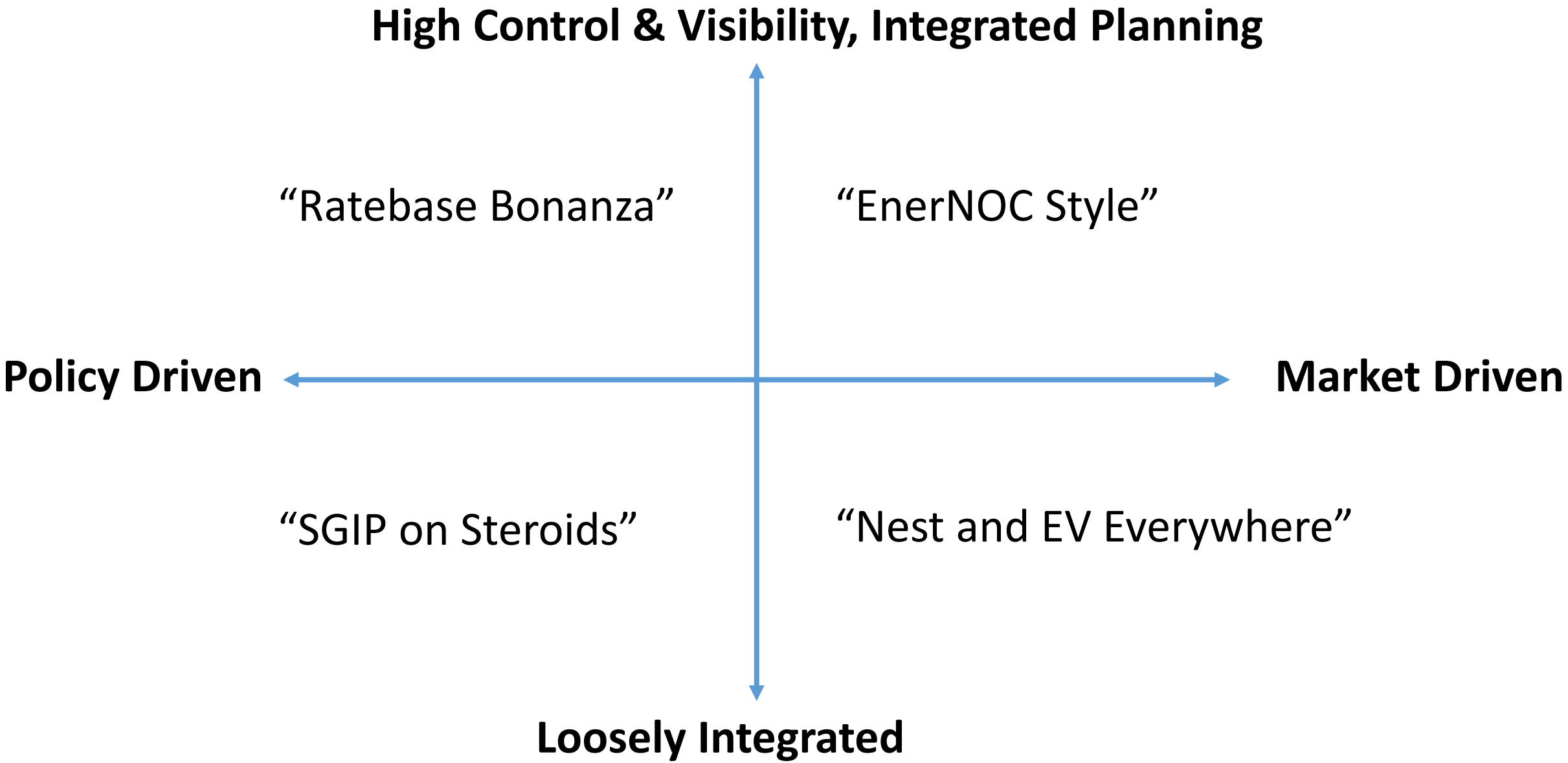
High Penetration of Energy Storage Objective

- In the past decade we have seen several studies focused on envisioning the impact of a high penetration of renewables on the grid, which informed the work undertaken to help use move in that direction.
- There have been very few comprehensive studies of a similar nature for energy storage, so the EAC energy storage subcommittee is developing a paper to inform how the DOE might fully engage on the topic.
- We are moving beyond technology and adoption forecasts to envision a possible end states. Such an exercise should help point us in the right direction on the type of analysis we need to consider today.

Scenarios


High Penetration of Variable Renewables
"CA Storage Mandate"
"Like Solar in Hawaii"
Policy Driven
Market Driven
"NY REV"
"PJM Frequency Reg"
Moderate Penetration of Variable Renewables

Scenarios


High Control & Visibility, Integrated Planning
“Ratebase Bonanza”
“EnerNOC Style”
Policy Driven
Market Driven
“SGIP on Steroids”
“Nest and EV Everywhere”
Loosely Integrated

HPES – High-Level Outline (draft)

- Frame ES modeling gap vs. renewable modeling by NREL and others
- Define key questions to be answered by DOE work
  - Comparison to existing DOE work in ES
- Define high-level drivers to consider and scenarios
  - Discuss paths from present to future states
  - Explore primary dimensions of impact
  - Define possible implications for the present
  - Other considerations
- Direct DOE to modeling and top 5 areas identified