



California ISO  
Shaping a Renewed Future

# Briefing on Renewable Integration Market Vision and Roadmap

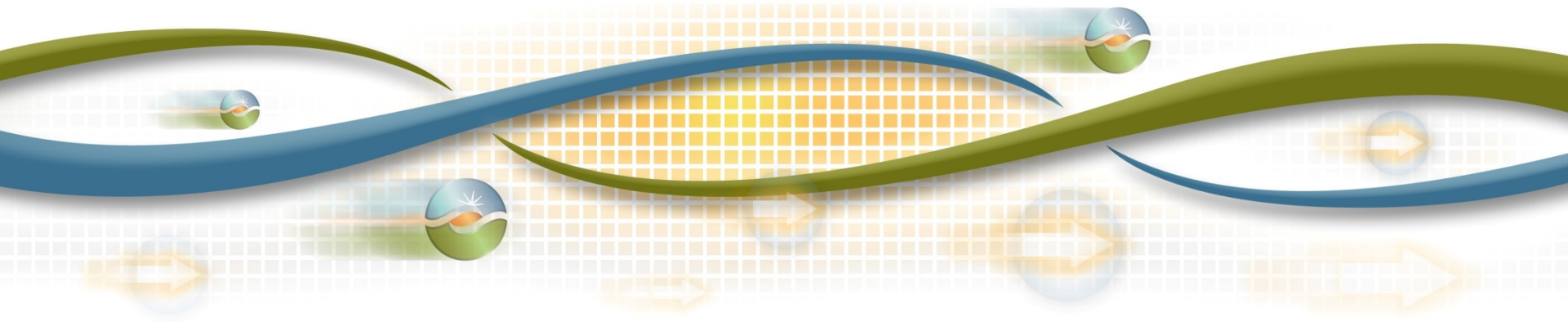
Greg Cook

Director – Market & Infrastructure Policy

Board of Governors Meeting

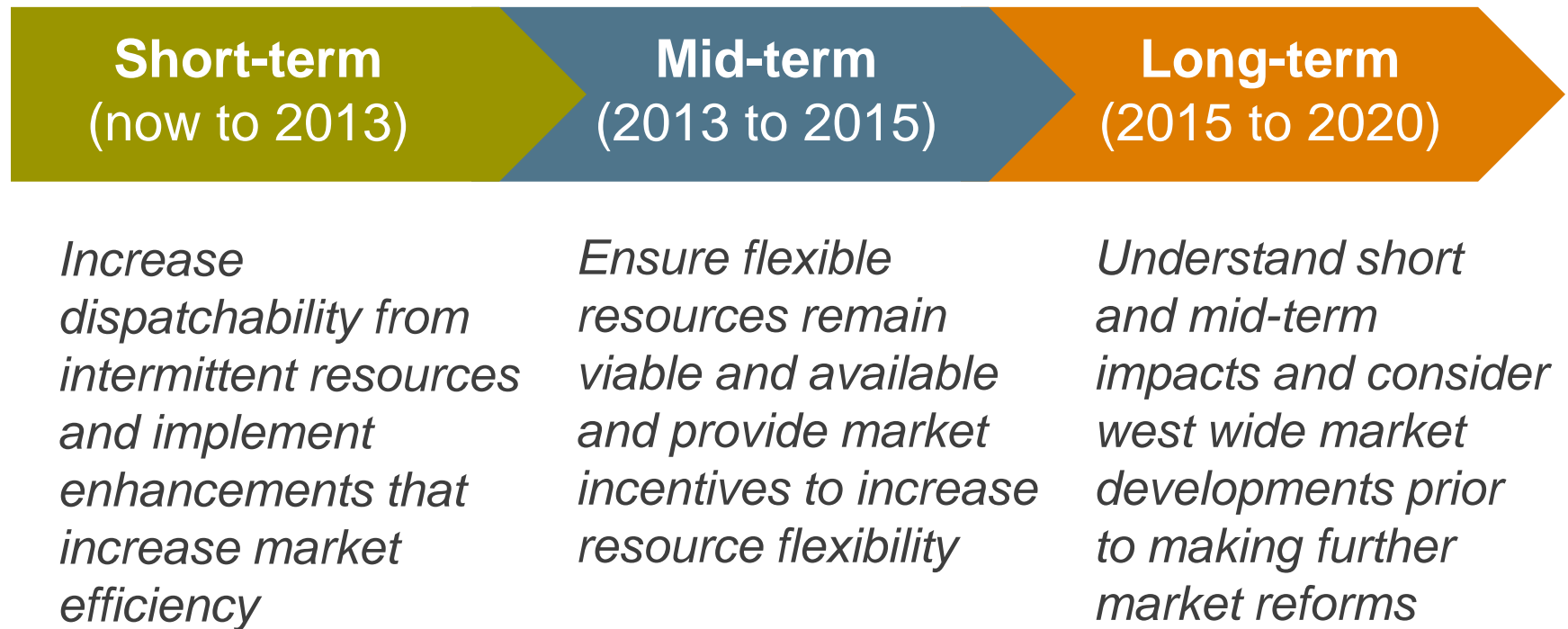
General Session

October 27-28, 2011



# The market vision and roadmap lays out an incremental approach for evolving the market.

## Objectives by Period:



# The proposed market enhancements by period are as follows:

**Short-term**  
(now to 2013)

**Mid-term**  
(2013 to 2015)

**Long-term**  
(2015 to 2020)

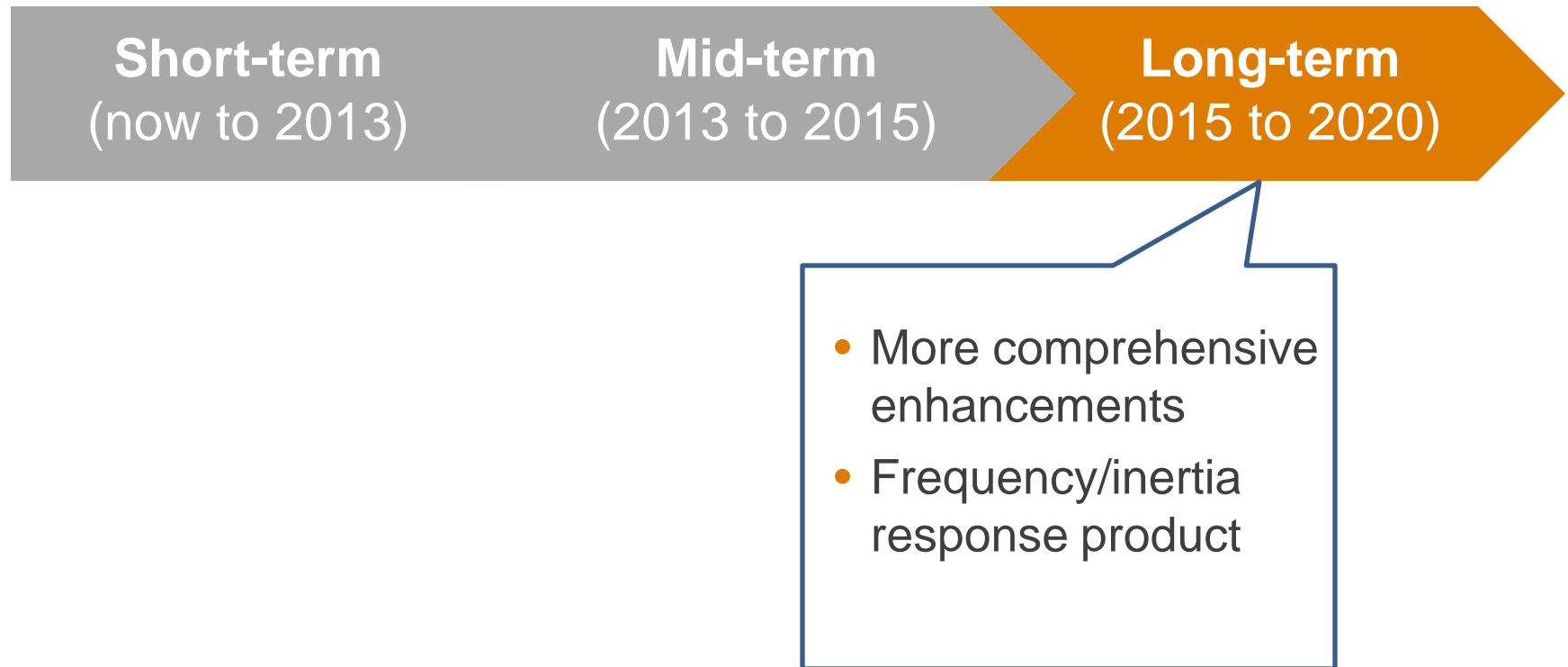
- Ramping and reserve management enhancements
  - ✓ Flexible ramping constraint
  - ✓ Regulation energy management
- Renewable integration policies
  - ✓ Dynamic transfers
  - ✓ Renewable integration market and product review phase 1 enhancements
- Operational enhancements
  - ✓ Wind and solar forecasting
  - ✓ Resource commitment

# The proposed market enhancements by period are as follows:



- Market enhancements
  - ✓ Flexi-ramp product
  - ✓ Intertie pricing & settlement
  - ✓ Flexible capacity forward procurement
  - ✓ Pay for performance regulation
  - ✓ Wind and solar decremental dispatch

# The proposed market enhancements by period are as follows:

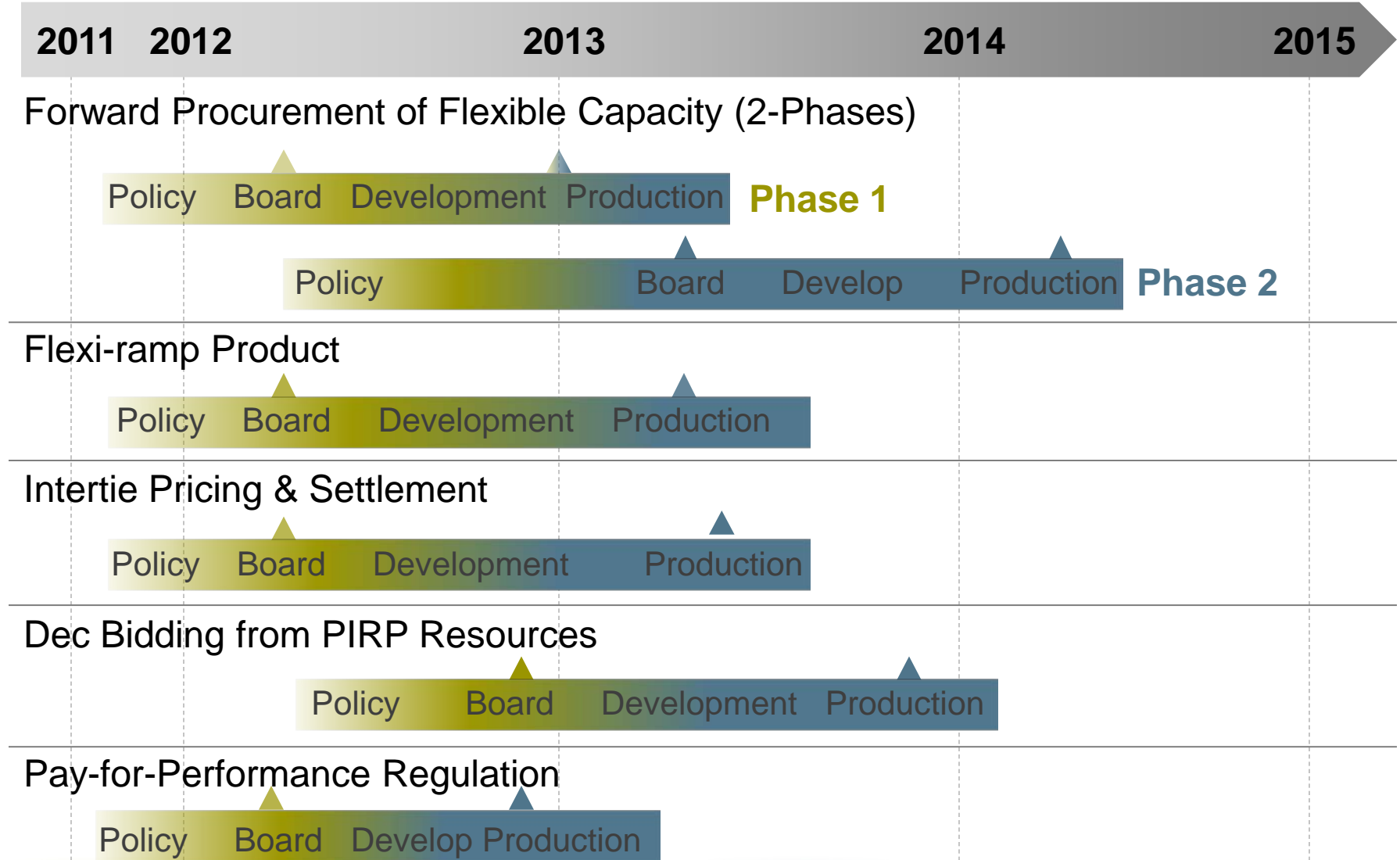


# Renewable integration design enhancements to be presented to the Board in December

## Short-term (now to 2013)

- Lower energy bid floor
- Changes to bid cost recovery rules
- Modifications to participating intermittent resource program

# The projected mid-term enhancements roadmap



# Significant challenges lie ahead

- Mechanisms to ensure sufficient flexible capacity is available to reliably operate the grid
  - Back stop procurement
  - Forward market mechanism
  - Coordination with CPUC resource adequacy program
- Cost allocation of integration services
- Leveraging existing market systems vs. developing new infrastructure