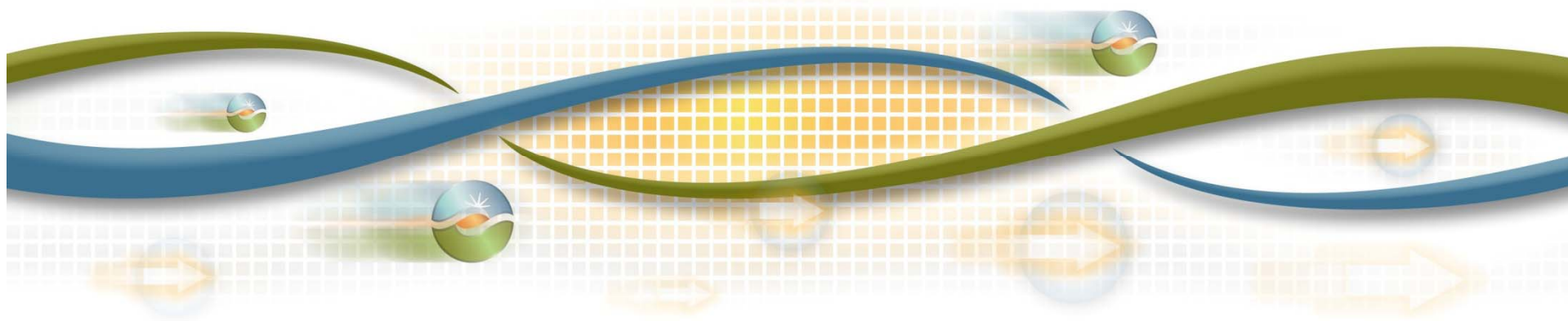


IEPR Committee Workshop

Transmission needed to meet State Renewable Policy Mandates and Goals

Neil Millar
Executive Director, Infrastructure Development
California ISO

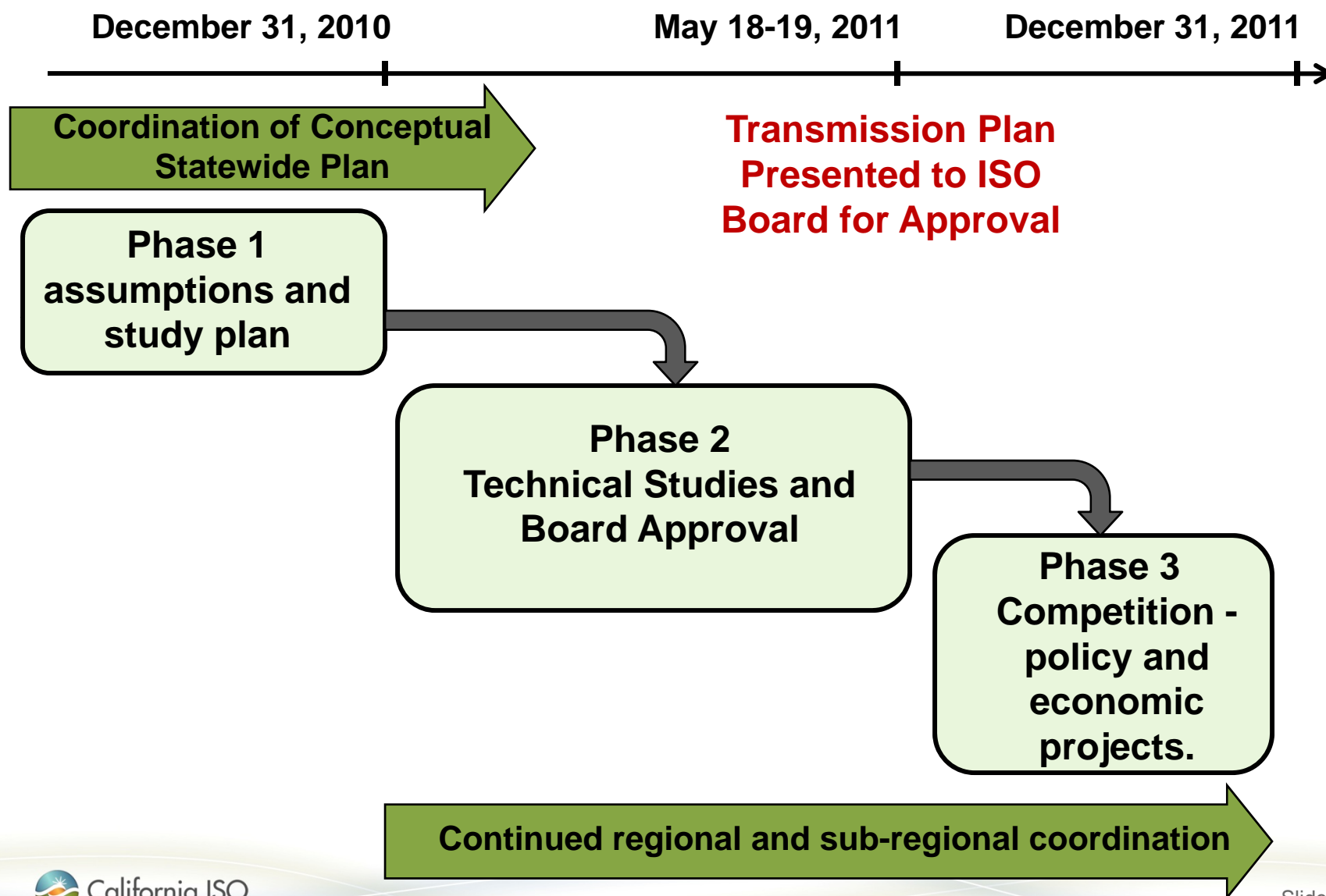
May 17, 2011



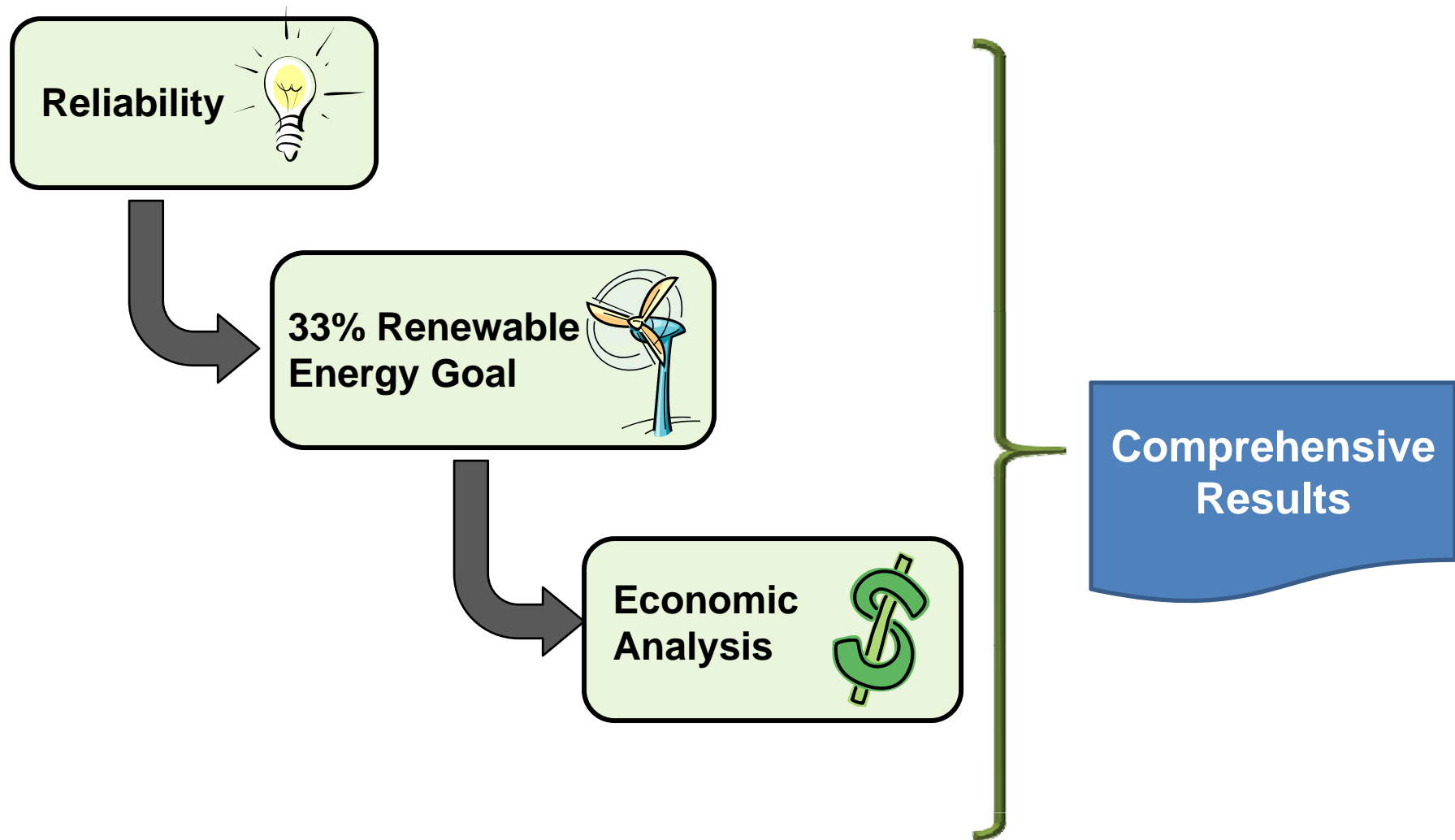
ISO 2010/11 Transmission Plan - the first transmission plan developed with new tariff.

- Enhanced collaboration - statewide conceptual transmission plan;
- New “policy-driven” category of transmission - state and federal public policy;
- Greater opportunity for independent transmission developers – compete to build policy-driven elements;
- More opportunities - stakeholder participation and input.

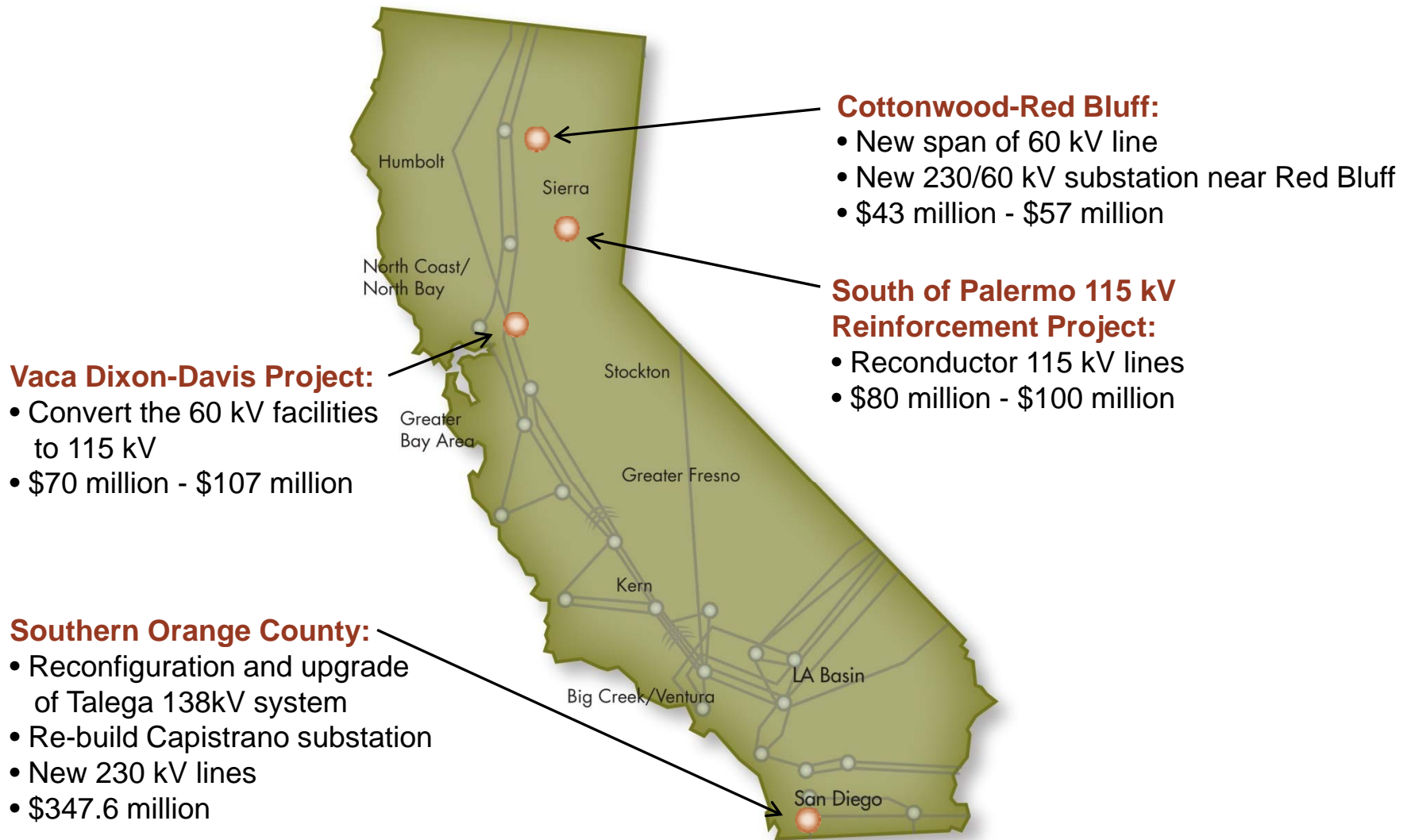
Development of Annual Transmission Plan



Development of Annual Transmission Plan



32 Reliability Projects totaling \$1.2 Billion



Policy driven projects were based on renewable energy zones and resources.



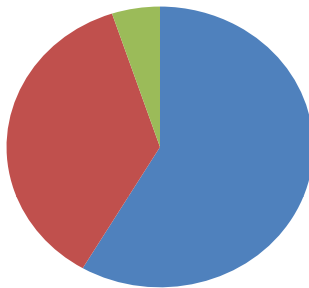
- ✓ Solar
- ✓ Wind
- ✓ Geothermal

Hybrid case: Statewide Net-Short could be met with less in-state large scale generation and more DG and Out-of-State.

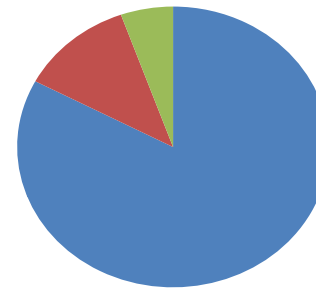
Portfolio		Hybrid Case	High Large Scale In-state Resources	High Out-of- State	High Distributed Generation
LGIP Projects	MW	12,909	15,730	10,314	9,282
	GWh	36,599	43,660	30,812	27,909
Out-of-State (OOS)	MW	3,842	2,292	7,458	2,292
	GWh	10,085	6,240	19,281	6,240
Distributed Generation (DG)	MW	2,930	1,303	1,223	9,248
	GWh	6,080	2,864	2,671	18,615
Total	MW	19,680	19,325	18,995	20,822
	GWh	52,763	52,764	52,764	52,764

Hybrid Portfolio represents a balanced approach to meeting the 33% RPS

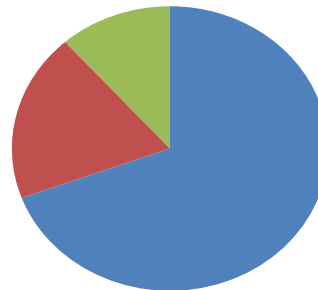
High Out-of-State Case



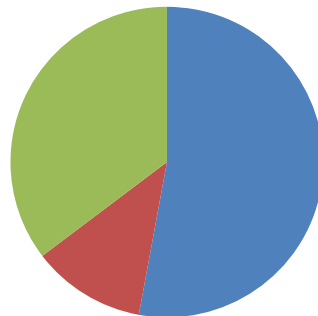
High Large-Scale In-State Case



Hybrid Case



High Distributed Generation Case



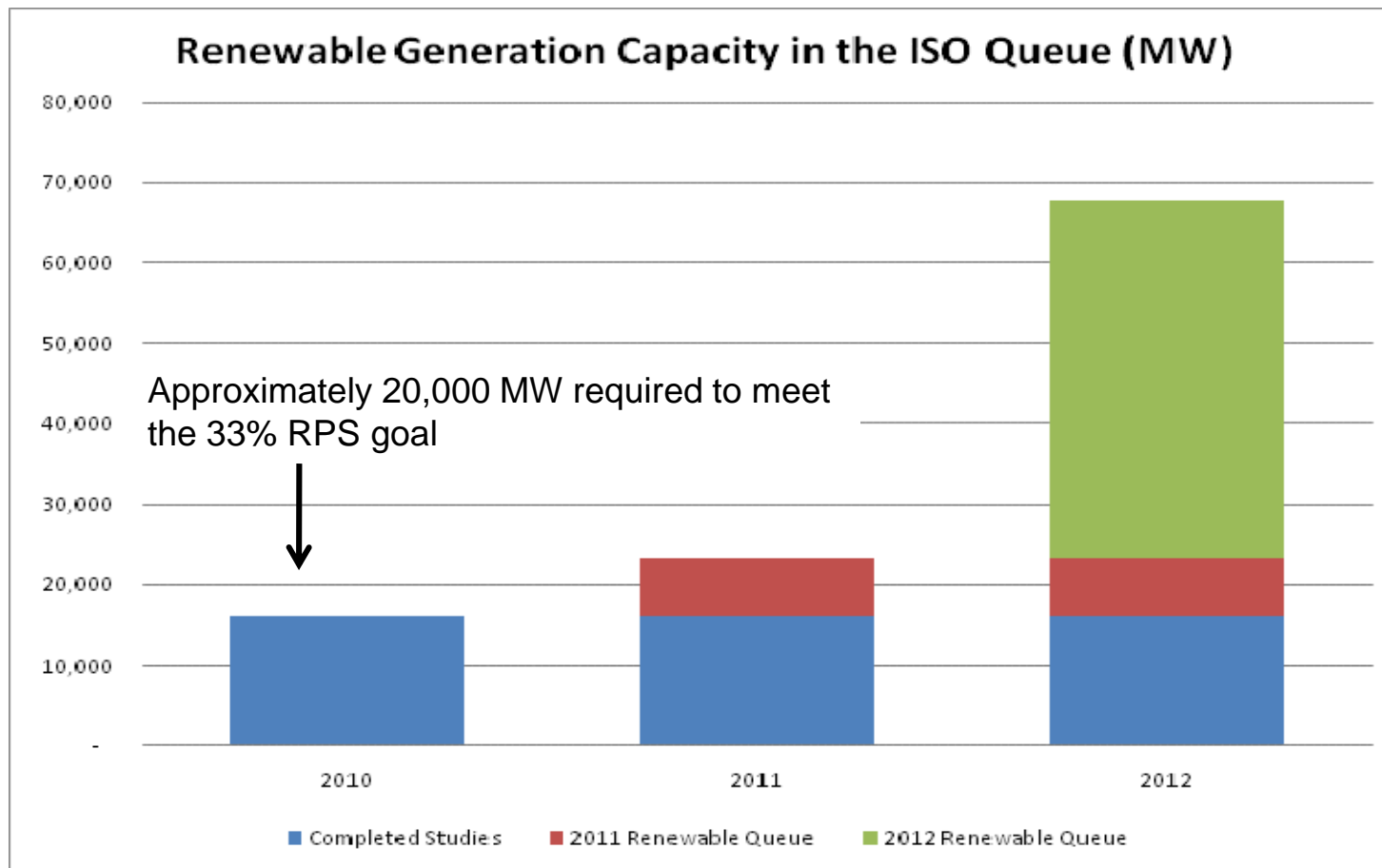
- Large-Scale In-State Resources
- Out-of-State Resources
- Distributed Generation

Transmission underway to meet 33% RPS in 2020



Transmission upgrade	Approval status		Renewable Potential		Online
	ISO	CPUC	MW	TWh/Yr	
1 Carrizo-Midway	Pending LGIA	Not yet filed	900	2.1	2012
2 Sunrise Powerlink	Approved	Approved	1,700	4.1	2012
3 Eldorado-Ivanpah	LGIA	Approved	1,400	3.6	2013
4 Pisgah-Lugo	LGIA	Not yet filed**	1,750	4.1	2017
5 Valley-Colorado River	Approved	Approved*	4,700	8.6	2013
6 West of Devers	LGIA	Not yet filed			2017
7 Tehachapi	Approved	Approved	4,500	15.2	2015
8 Tehachapi Wind/Solar Diversity	N/A	N/A	1,000	3.0	2015
9 Cool Water-Lugo	Pending LGIA	Not yet filed	600	1.4	2018
10 South Contra Costa	LGIA	Not yet filed	300	0.8	2015
11 Borden-Gregg	LGIA	Not yet filed	800	2.0	2015
12 Path 42	Pending approval	Not yet filed	1,400	3.5	2015
Other-Outside of ISO Grid	N/A	N/A	3,300	8.4	
Total			22,350	56.8	
TWh/year needed in ISO area to meet 33% goal:				44	

Renewable generation capacity in the ISO queues



Conclusions

- Transmission approved to date within ISO footprint can accommodate a diverse range of 33% resource portfolios for meeting the 33% RPS. – No new major projects needed at this time.
- As assumptions change going forward, the ISO will reassess transmission needs through its annual planning process.
- The ISO is relying on the CPUC portfolios in the 2011/2012 planning cycle.
- Focus within the state now should be on permitting the identified transmission.