



Energy+Environmental Economics

# HECO Grid Symposium: Locational Value

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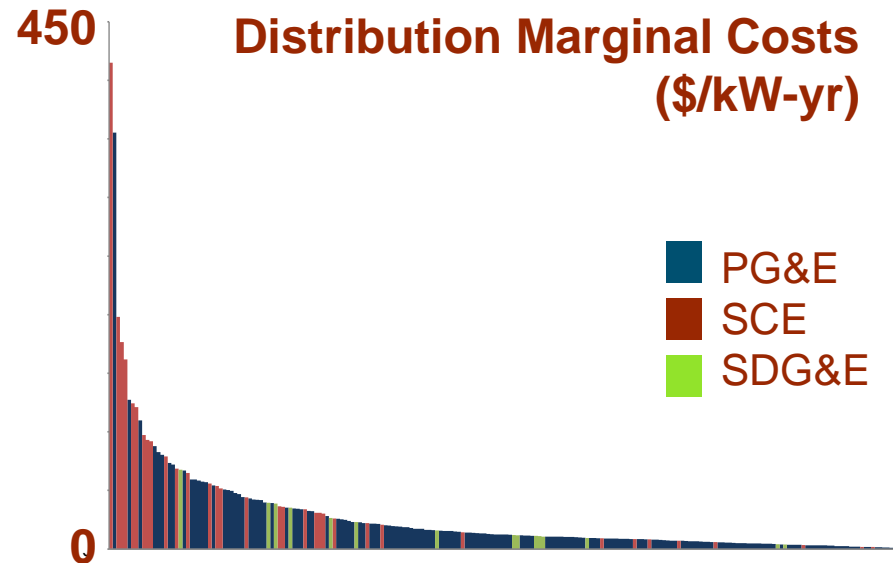
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# Background on Locational Values

- + **Kerman and Delta Studies (1992-3)**
- + **LIRP Non-Wires Alternatives**
- + **Recent regulator interest in efficiency and advocate interest in value boosters**
- + **Value driven by deferring large capital projects.**
- + ***Hawaii is different***
  - *Different DER*
  - *Different growth*
  - *Value may be driven by reducing costs from DER*





# LNBA Tool in California

- + Demo B work completed in 2016
- + Now transitioning to system wide analyses
- + Use cases are evolving

Lifecycle Value from DER by Component (\$)		
	Circuit 1102	All Affected Areas
Energy	\$1,998,095	\$1,998,095
Gen Capacity	\$362,696	\$362,696
Ancillary Services	\$18,462	\$18,462
CO2	\$794,182	\$794,182
RPS	\$808,743	\$808,743
Flex RA	-\$168,364	-\$168,364
Integration Cost	-\$221,372	-\$221,372
System Transmission	\$54,789	\$54,789
<b>Local T&amp;D</b>	<b>\$231,624</b>	<b>\$5,976,381</b>
<b>Total Avoided Cost (\$)</b>	<b>\$3,878,854</b>	<b>\$9,623,611</b>

Heatmap of LNBA Local T&D Costs (Total \$/kW in each month/hour)																								
All Affected Projects	Hour of the Year (hour starting PST)																							
	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23
Jan	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Feb	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Mar	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1	1	0	0	0	0	0	0	0
Apr	0	0	0	0	0	0	0	0	0	0	0	1	1	1	1	1	1	1	0	0	0	0	0	0
May	0	0	0	0	0	0	0	0	0	0	1	1	2	2	3	2	2	2	1	0	0	0	0	0
Jun	0	0	0	0	0	0	0	0	1	2	2	3	3	3	3	11	3	2	2	1	1	0	0	0
Jul	0	0	0	0	0	0	0	1	1	2	3	8	206	469	519	400	118	3	2	2	1	1	1	1
Aug	0	0	0	0	0	0	0	1	1	2	3	3	52	189	300	157	4	3	2	2	1	1	1	1
Sep	0	0	0	0	0	0	0	1	1	2	3	62	213	509	574	239	3	3	2	2	1	1	1	1
Oct	0	0	0	0	0	0	0	0	1	2	2	3	18	18	18	18	2	2	1	1	0	0	0	0
Nov	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Dec	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

Heatmap of DER average hourly output (not adjusted for losses or dependability)																								
All Affected Projects	Hour of the Year (hour starting PST)																							
	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23
Jan	0	0	0	0	0	0	0	7.33	292	694	890	1103	1157	1199	1103	850	213	0	0	0	0	0	0	0
Feb	0	0	0	0	0	0	0	87.1	451	815	1046	1249	1248	1241	897	728	554	42.1	0	0	0	0	0	0
Mar	0	0	0	0	0	0	20.1	370	926	1452	1717	1883	1946	1897	1636	1354	845	185	0	0	0	0	0	0
Apr	0	0	0	0	0	0.74	167	599	1126	1510	1794	1969	2094	2013	1791	1356	902	445	12.9	0	0	0	0	0
May	0	0	0	0	0	38.8	308	817	1311	1722	2061	2177	2146	2125	1864	1479	958	530	78.9	0	0	0	0	0
Jun	0	0	0	0	0	51.1	289	705	1146	1572	1876	2097	2217	2190	1989	1617	1109	603	235	0.42	0	0	0	0
Jul	0	0	0	0	0	28.1	222	591	1145	1654	2090	2300	2338	2278	1991	1651	1161	633	236	0.21	0	0	0	0
Aug	0	0	0	0	0	2.24	156	552	1000	1556	1990	2244	2310	2266	2007	1581	1058	483	20.5	0	0	0	0	0
Sep	0	0	0	0	0	90.9	494	972	1351	1834	2129	2203	2097	1807	1365	822	188	0.13	0	0	0	0	0	0
Oct	0	0	0	0	0	18.3	372	883	1353	1730	1882	1898	1823	1478	1025	403	13.1	0	0	0	0	0	0	0
Nov	0	0	0	0	0	0	0	162	593	941	1144	1351	1325	1221	971	647	70.2	0	0	0	0	0	0	0
Dec	0	0	0	0	0	0	25	373	677	919	1088	1158	1104	778	549	82.8	0	0	0	0	0	0	0	0



# Key use cases

- + Improve integrated resource plans**
- + Inform non-wires alternatives and the DER players**
- + Direct the smart location of DER, or smart operation of DER, in high DG penetration areas**
- + Increase the potential value of responsive programs or the effectiveness of dynamic rates**



# Thoughts for Hawaii

- + What is the base case for your locational values?**
- + How will you be using locational values?**
- + Do you want to be on the leading edge?**