Entergy Arkansas, Inc response to questions from Stakeholders at the July 31, 2012 Integrated Resource Planning (IRP) Meeting

August 20, 2012

#	Question	Answer
1	Who were the parties to the CSAPR lawsuit?	USCA Case # 11-1302 *EME Homer City Generation LP v. EPA*. There were multiple petitioners.
2	Which court in the CSAPR case in?	The United States Court of Appeals for the D.C. Circuit
3	What is the equivalent level of energy production associated with 100,000 tons of CO2?	For 100,000 tons Co2 Typical Coal Plant – 2138 lb CO2/MWhr or 93,566 MWhr Typical Gas Plant – 1465 lb CO2/MWhr or 136,528 MWhr Typical Combustion Turbine Plant – 1341 lb CO2/MWhr or 149,087 MWhr Typical Combined Cycle Plant – 855 lb CO2/MWhr or 234,004 MWhr
4	What is the % energy savings associated with energy efficiency program over time?	See slide 21 of Richard Smith's presentation from the July 31 IRP meeting. http://entergy-arkansas.com/content/transition_plan/demand_management.pdf
5	Does EAI limit the term of purchase power contracts?	No, EAI evaluates PPAs that may be proposed to it regardless of the term of the offer.
6	What happens to EAI's resource planning if ITC owns the transmission system?	Assuming EAI joins MISO, EAI will be a transmission customer under the OATT whether EAI owns the transmission system or not, and in any case, EAI will participate in the MISO transmission planning process.

7	What environmental controls will be required if the final version of the CSAPR don't change much?	It is anticipated that Low NOx Burners and Separated Overfired Air would be installed on one or both of the units at White Bluff if CSAPR doesn't change significantly.
8	How big must a unit be to be subject to the NSPS for GHG?	40 CFR Part 60--Standards Of Performance For New Stationary Sources - Fossil-fuel-fired steam generating unit of more than 73 megawatts (MW) heat input rate (250 million British thermal units per hour (MMBtu/hr)). Proposed Standards of Performance for Greenhouse Gas Emission for New Stationary Sources: Electric Utility Generating Units for Electric Utility Generating Unit that Commences Construction After April 13, 2012 - Electric Utility Generating Unit with a base load rating of more than 73 MW (250 million British thermal units per hour (MMBtu/hr)) heat input of fossil fuel.
9	Do the tests at the bottom of slide 22 of Richard Smith's presentation only apply to the reference case forecast?	Yes
10	Is the primary test for DSM the resource cost test?	Yes. EAI uses the results of theTotal Resource Cost test as the primary tool to evaluate cost effectiveness of energy efficiency.
11	What % funding is assumed for the DSM potential reference case modeled in the IRP?	The cost of energy efficiency included in the EAI IRP starts around 2.3% and grows to around 4.5% over the ten year period. These percentages are based upon 2011 EAI retail revenues in the 2011 Arkansas report filed at the APSC.
12	Please provide more details on the assumptions behind the levelized bus bar cost of the different generation technologies. Please break down the wind analysis to its components of integration cost, dispatch costs and energy costs. Are incentives accounted for in your analysis?	Please see below for a break- down of the assumptions and the details of the calculations

Levelized Bus Bar Cost:

Line No.	Description	Measure	Formula	CCGT Without CO2	CCGT With CO2	Biomass w/o Incentive	Biomass w/ Incentive	Wind w/o Incentive	Wind w/ Incentive	Solar PV w/o Incentive	Solar PV w/ Incentive
1	Installed Cost (2012 $'s)	($/kW)		$1,395	$1,395	$4,856	$4,856	$2,033	$2,033	$5,166	$5,166
2	Levelized Fixed Charge Rate (LFCR)	(%)		14.1%	14.1%	13.1%	13.1%	14.7%	14.7%	11.8%	11.8%
3	Levelized Annual Fixed Charge	($/kW-yr.)	[Ln. 1 * Ln. 2]	$196.33	$196.33	$636.72	$636.72	$299.42	$299.42	$607.47	$607.47
4	Capacity Factor	(%)		65%	65%	80%	80%	39%	39%	20%	20%
5	Energy Generation	(MWh/MW)	[8760 hrs. * Ln. 4]	5,694	5,694	7,008	7,008	3,416	3,416	1,752	1,752
6	Levelized Annual Fixed Charge	($/MWh)	[Ln. 3 *1000 / Ln.5]	$34.48	$34.48	$90.86	$90.86	$87.64	$87.64	$346.73	$346.73
7	Levelized Incentive (ITC or PTC)	($/MWh)		$0.00	$0.00	$0.00	$24.59	$0.00	$25.00	$0.00	$110.49
8	Levelized Annual Net Fixed Charge	($/MWh)	[Ln. 6 - Ln. 7]	$34.48	$34.48	$90.86	$66.27	$87.64	$62.64	$346.73	$236.24
9	Levelized Variable O&M Cost	($/MWh)		$3.10	$3.10	$3.72	$3.72	$1.19	$1.19	$0.00	$0.00
10	Heat Rate	(MMBtu/MWh)		6.950	6.950	11.000	11.000	-	-	-	-
11	Levelized Fuel Cost	($/MMBtu)		$6.29	$6.29	$3.93	$3.93	-	-	-	-
12	Levelized Energy Cost	($/MWh)	[Ln. 10 * Ln. 11]	$43.71	$43.71	$43.23	$43.23	$0.00	$0.00	$0.00	$0.00
13	CO2 Emissions Rate	(lbs./MMBtu)		118.9	118.9	-	-	-	-	-	-
14	CO2 Emissions	(lbs./MWh)	[Ln. 10 * Ln. 13]	826.4	826.4	-	-	-	-	-	-
15	Levelized CO2 Cost	($/Ton)		$0.00	$13.43	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00
16	Levelized Emissions Cost	($/MWh)	[Ln. 14 / 2000 * Ln. 15]	$0.00	$5.55	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00
17	Levelized Capacity Matchup Cost	($/MWh)	[Ln.24]	$0.00	$0.00	$0.00	$0.00	$34.01	$34.01	$62.83	$62.83
18	Levelized Flexible Capability Cost	($/MWh)	[Ln. 44]	$0.00	$0.00	$0.00	$0.00	$14.24	$14.24	$27.77	$27.77
19	Levelized Total Bus Bar Cost	($/MWh)	[Ln. 8 + Ln. 9 + Ln. 12 + Ln. 16 + Ln. 17 + Ln. 18]	$81.29	$86.84	$137.81	$113.22	$137.08	$112.08	$437.33	$326.84

Note: Book lives assumed are 30 years for CT, CCGT, and Biomass; 25 years for Solar PV; and 20 years for Wind

Levelized Capacity Matchup Cost:

Line No.	Description	Measure	Formula	CCGT Without CO2	CCGT With CO2	Biomass w/o Incentive	Biomass w/ Incentive	Wind w/o Incentive	Wind w/ Incentive	Solar PV w/o Incentive	Solar PV w/ Incentive
20	Installed Cost of a CT	($/kW)						$929	$929	$929	$929
21	Levelized Fixed Charge Rate (LFCR) for CT	(%)						13.2%	13.2%	13.2%	13.2%
22	Levelized Annual Fixed Charge for a CT	($/kW-yr.)	[Ln. 20 * Ln. 21]					$122.31	$122.31	$122.31	$122.31
23	CT Capacity Value	(%)						100%	100%	100%	100%
24	Renewable Capacity Value	(%)						5%	5%	10%	10%
25	Capacity Matchup Requirement	(%)	[Ln. 23 - Ln. 24]					95%	95%	90%	90%
26	Capacity Matchup Cost	($/kW-yr.)	[Ln. 22 * Ln. 25]					$116.20	$116.20	$110.08	$110.08
27	Renewable Capacity Factor	(%)						39%	39%	20%	20%
28	Renewable Energy Generation	(MWh/MW)	[8760 hrs. * Ln. 27]					3,416	3,416	1,752	1,752
29	Renewable Capacity Matchup Cost	($/MWh)	[Ln. 26 * 1000 / Ln. 28]					$34.01	$34.01	$62.83	$62.83

Levelized Flexible Capability Cost:

Flexible Capability provided by the subsitution of a CCGT for a CT

CCGT	Biomass	Wind	Solar PV

Line No.	Description	Measure	Formula	Without CO2	With CO2	w/o Incentive	w/ Incentive	w/o Incentive	w/ Incentive	w/o Incentive	w/ Incentive
--- Fixed Cost ---											
30	Installed Cost of a CCGT	($/kW)						$1,395	$1,395	$1,395	$1,395
31	Levelized Fixed Charge Rate (LFCR) for CCGT	(%)						14.1%	14.1%	14.1%	14.1%
32	Levelized Annual Fixed Charge for a CCGT	($/kW-yr.)	[Ln. 30 * Ln. 31]					$196.33	$196.33	$196.33	$196.33
33	Installed Cost of a CT	($/kW)						$929	$929	$929	$929
34	Levelized Fixed Charge Rate (LFCR) for CT	(%)						13.2%	13.2%	13.2%	13.2%
35	Levelized Annual Fixed Charge for a CT	($/kW-yr.)	[Ln. 33 * Ln. 34]					$122.31	$122.31	$122.31	$122.31
36	Levelized Fixed Charge Differential	($/kW-yr.)	[Ln. 32 - Ln. 35]					$74.02	$74.02	$74.02	$74.02
37	Percent of Time Flexible Capability Required	(%)						50%	50%	50%	50%
38	Levelized Fixed Charge for Flexible Capability	($/kW-yr.)	[Ln. 36 * Ln. 37]					$37.01	$37.01	$37.01	$37.01
39	Renewable Capacity Factor	(%)						39%	39%	20%	20%
40	Renewable Energy Generation	(MWh/MW)	[8760 hrs. * Ln. 39]					3,416	3,416	1,752	1,752
41	Levelized Flexible Capability Fixed Cost	($/MWh)	[Ln. 38 * 1000 / Ln. 40]					$10.83	$10.83	$21.12	$21.12
--- Energy Cost ---											
42	Part Load Heat Rate Penalty for a CCGT	(MMBtu/MWh)						0.650	0.650	0.650	0.650
43	Levelized Cost of Natural Gas	($/MMBtu)						$6.29	$6.29	$6.29	$6.29
44	Part Load CCGT Energy Cost	($/MWh)	[Ln. 42 * Ln. 43]					$4.09	$4.09	$4.09	$4.09
45	CCGT Capacity Factor	(%)						65%	65%	65%	65%
46	Percent of Time Flexible Capability Required	(%)						50%	50%	50%	50%
47	Annual Part Load Generation	(MWh/MW)	[8760 hrs. * Ln. 45 * Ln. 46]					2,847	2,847	2,847	2,847
48	Annual Part Load Energy Cost	($/kW-yr.)	[Ln. 44 * Ln. 47 / 1000]					$11.64	$11.64	$11.64	$11.64
49	Renewable Capacity Factor	(%)						39%	39%	20%	20%
50	Renewable Energy Generation	(MWh/MW)	[8760 hrs. * Ln. 49]					3,416	3,416	1,752	1,752
51	Levelized Flexible Capability Energy Cost	($/MWh)	[Ln. 48 * 1000 / Ln. 50]					$3.41	$3.41	$6.64	$6.64
--- Total Cost ---											
52	Levelized Flexible Capability Total Cost	($/MWh)	[Ln. 41 + Ln. 51]					$14.24	$14.24	$27.77	$27.77