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Comments on the PMPD and FDOC on Behalf of Helping Hand Tools

Additional submitted attachment is included below.

STATE OF CALIFORNIA
ENERGY RESOURCES CONSERVATION
AND DEVELOPMENT COMMISSION

In the Matter of:)	
Application for Certification for the)	Docket No. 12-AFC-02
HUNTINGTON BEACH)	
ENERGY PROJECT)	
)	
_____)	

Comments on the PMPD and FDOC on Behalf of Helping Hand Tools

Introduction

On behalf of Helping Hand Tools we submit the following comments on the PMPD and the FDOC for the Huntington Beach Power Plant. The comments address the PMPD and the FDOC's compliance with CEQA, State, Federal, and PSD requirements for the proposed project. We find numerous violations of CEQA, Air District and EPA requirements for the project which must be corrected before the PMPD is issued.

BACT for GHG Emissions and GHG Alternatives Emission Limits

The alternatives evaluation of staff examines alternative technologies such as peaker plants, solar, wind, and nuclear technologies. What the alternatives analysis fails to do is compare the HBEP technology with other recently permitted combined cycle power plants. The HBEP GHG emissions are higher than any combined cycle project recently approved by the CEC. The HBEP is expected to have a GHG emission rate of .479 MTCO₂E/MWh. A list of recently approved plants below show that the HBEP GHG emission rate is on average 20-25% higher than the three latest combined cycle approved projects by the Commission. The applicant suggests that the HBEP GHG emission rates should be compared to

simple cycle emission rates because of the project alleged high ramp rates.¹ In fact the HBEP GHG emissions are higher than recently approved peaker plants. The HBEP has a projected CO₂ emission rate 7% higher than the Sentinel Peaking Project which utilizes GE LM-100 peaking technology. While allegedly the 939 MW HBEP has a ramp rate of 700 MW in ten minutes the Sentinel Peaking Project can bring its entire 850 MW output online in 10 min. The Sentinel peaking project has a 7% lower heat rate and a faster ramp rate.

GHG Emissions from recently approved CEC Power Plants		
Plant	Technology	MTCO ₂ E/MWh
Huntington Beach	Combined Cycle	.479 ²
Carlsbad	Combined Cycle	.405 ³
Avenal	Combined Cycle	.383 ⁴
Oakley	Combined Cycle	.357 ⁵
Pio Pico	Peaker	.477 ⁶
Sentinel	Peaker	.451 ⁷

As the FDOC acknowledges, “the HBEP turbines are not the most efficient units on the market when compared to other F and G class turbines.”⁸ The anticipated load range for the HBEP is approximately 160 to 528 MW for each 3X1 power island. The heat rate for this operating range is estimated to be 8,800 to 8,140 btu/kWh HHV.⁹ According to the record evidence in this proceeding the average heat rate of modern combined cycle power plants is 7,201 Btu per kWh.¹⁰ The heat rate of the HBEP is up to 22 % worse than the average modern combined cycle project. A review of current average heat rates in 2013 shows that the HBEP emits 14%-31% more GHG emissions than vintage plants approved by the

¹ “The HBEP offers the flexibility of fast start and ramping capability of a simple-cycle configuration, as well as the high efficiency associated with a combined cycle. Therefore, comparison of operating efficiency and heat rate of the HBEP should be made with simple cycle or peaking units instead of combined-cycle or more base-loaded units.”

http://www.energy.ca.gov/sitingcases/huntington_beach_energy/documents/applicant/AFC/Volume%20%20Appendices/HBEP_Appendix%205.1D_BACT%20Determination.pdf Page 3-24

² HBGS PMPD Page 4.1-16 Finding of Fact Number 7

³ CECP Final Decision Page 6.1-21 Finding of Fact Number 4

⁴ Avenal Final Decision page 112 Finding of Fact Number 8

⁵ Oakley Final Decision GHG Emission Page 13 Finding of Fact Number 7

⁶ Pio Pico Final Decision Page 6.1-14 Finding of Fact Number 7

⁷ Sentinel Final Decision GHG Emissions Page 11 Finding of Fact Number 7

⁸ FDOC Page 19

⁹ FDOC Page 19

¹⁰ FSA Page 4.1-101

CEC between 2000-2003. These QFER heat rates are actual average heat rates under all operational scenarios. If the HBEP were to emit its maximum amount of GHG emissions of 1,997,634 MTCO₂/MWh higher efficiency combined cycle technology that was permitted between 2000 and 2003 could reduce GHG emissions by as much as 619,266 MTCO₂/MWh per year. There is no reason to approve a combined cycle plant such as the HBEP with its low efficiency.

Average heat rate of current combined cycle power plants QFER 2013				
Project	2013 QFER Heat Rate ¹¹	Date Approved	% better than HBEP	Max Change GHG
Otay Mesa	6.75935482127901	4/18/01	21% - 31%	-619,266 MTCO ₂ /MWh
Inland Empire	7.0278764067657	12/17/03	16% - 26%	-519384 MTCO ₂ /MWh
Gateway	7.15368415379543	5/30/01	14% - 23%	-459,455 MTCO ₂ /MWh
Consumnes	6.7868197312228	9/9/03	20% - 30%	-599.290 MTCO ₂ /MWh
Palomar	6.97459224260604	8/6/03	17% - 27%	-539.361 MTCO ₂ /MWh
Elk Hills	7.18858257403774	12/06/01	14%- 23%	-458,455 MTCO ₂ /MWh
Delta	7.1861792745729	2/09/00	14% - 23%	-458.455 MTCO ₂ /MWh
HBEP	8.800- 8.140			

The evidence shows that the HBEP has a heat rate in excess of the WECC average as shown in table 4 below.¹² The Energy Commission established a precedent decision in the Final Commission Decision for the Avenal Energy Project (CEC 2009b), finding as a conclusion of law that any new natural gas-fired power plant certified by the Energy Commission “must not increase the overall system heat rate for natural gas plants which is the weighted average heat rate for operating natural gas fired power plants in the WECC.”¹³ This project with its excessive heat rate actually increases average heat rates in the WECC.

¹¹ http://energyalmanac.ca.gov/electricity/web_qfer/Heat_Rates.php

¹² FSA Page 4.1-104

¹³ FSA Page 4.1-104

Greenhouse Gas Table 4
Weighted Average Heat Rate for Operating Natural Gas-Fired Plants¹ in the
WECC 2010-2012

Year	Average Heat Rate (mmBtu/kWh)
2010	7,784
2011	7,995
2012	7,918

¹ Excludes cogeneration facilities

(Ex. 2000, p. 4.1-104.)

Even the Committee recognizes that the technology proposed for the HBEP is inefficient and dated compared to recently licensed and proposed power plants. At the Scheduling Conference on April 8, 2014, the Committee asked how, given the long construction period, improved technology would be incorporated into the HBEP. This question was particularly addressed to power block 2, but applied to power block 1 as well.¹⁴

Federal New Source Performance Standard

On January 8, 2014, in the Federal Register the US EPA proposed New Source Performance Standard for GHG emissions for new electric power plants. This new requirement would limit large natural gas-fired stationary combustion turbines to no more than 1,000 lbs CO₂ per MWh. The HBEP will emit CO₂ at a rate of 1,053.7 lb CO₂ per net megawatt hour according to the evidence in the record.¹⁵ Staff speculates that the HBEP may be able to meet the federal GHG performance standard by limiting its operations. According to evidence, “the facility is likely to exceed the limit when operating in a one-on-one configuration (one combustion turbine plus steam turbine) with the combustion turbine operating at less than about 90 percent load (corresponds to 144,285 KW from the facility) given the listed heat rate of 8,436 Btu/KWh at that load point. It is also likely to exceed the limit below about 80 percent turbine power (268,702 KW in a two-on-one configuration and 367,918 KW in a three-on-one configuration) with listed heat rates of 8,346 Btu/KWh for the two-on one configuration and 8,449 for the

¹⁴ PMPD Page 2-8

¹⁵ FSA Page 4.-91

three-on-one configuration.¹⁶ In order to meet the federal GHG standards the project will not be able to operate under 90% load with only 1 turbine/HRSG operating and 80% load with two or three turbine/HRSG operating. The usefulness of the project in integrating renewables is severely limited since the project will not be able to operate under 80% load due to the Federal GHG performance standard.

BACT for CO

The PMPD and the FDOC propose a 2ppm limit for CO emissions. A 2ppm CO limit is not BACT or LEAR for CO emissions. The evidence in the record is that, the Kleen Energy Systems was able to successfully demonstrate compliance with the CO emission limits of 0.9 and 1.5 ppmvd for unfired and fired operation, respectively.¹⁷ This is the appropriate BACT limit for the HBEP not 2 ppm averaged over 1 hour.

The Palmdale Hybrid project has a 1.5 ppm CO limit in its PSD permit.¹⁸ Virginia Electric and Power Company's Warren County Facility has permitted limits of 1.2 and 1.3 ppmvd at 15% O₂.¹⁹

BACT for VOC

The FDOC and the PMPD propose a 2ppm VOC limit as BACT for the HBEP. The 2ppm VOC limit is not BACT/LEAR for CO emissions. The applicant has proposed and demonstrated in his BACT analysis that a 1 ppm VOC limit is achievable and is being achieved on current natural gas fired power plants.²⁰ The table below demonstrates that a VOC emission rate of 1.0 ppmvd (1-hour) without duct burner and 1.0ppmvd with duct burners (3-hour) for the

¹⁶ FSA Page 4.1-91

¹⁷

http://www.energy.ca.gov/sitingcases/huntington_beach_energy/documents/applicant/AFC/Volume%20%20Appendices/HBEP_Appendix%205.1D_BACT%20Determination.pdf Page 2-8

¹⁸ After 3 year demonstration period.

¹⁹ <http://www.epa.gov/region9/air/permit/avenal/AvenalFinalResponse2Comments5-27-11.pdf> Page 20

²⁰ As shown in Table 2-4, the proposed VOC emission rate of 1.0 ppmvd (1-hour) without duct burners and 1.0ppmvd with duct burners(3-hour) for the HBEP is the lowest VOC emission rate demonstrated in practice or permitted for other facilities using good combustion practices and an oxidation

catalyst.http://www.energy.ca.gov/sitingcases/huntington_beach_energy/documents/applicant/AFC/Volume%20%20Appendices/HBEP_Appendix%205.1D_BACT%20Determination.pdf Page 2-11

HBEP is the lowest VOC emission rate demonstrated in practice or permitted for other facilities using good combustion practices and an oxidation catalyst.

TABLE 2-4
Summary of VOC Emission Limits for Combined-cycle Turbines
Emission Control Ranking for Turbines With and Without Duct Burner Firing

Facility	Facility ID Number	VOC Emission Limit at 15 percent O ₂
Los Esteros Critical Energy Facility – Phase 2c	2003-AFC-2	2.0 ppm with duct burners (3-hour)
GWF Tracy Combined-cycle Project	2008-AFC-7	1.5 ppm without duct burners (3-hour); 2.0 ppm with duct burners (3-hour)
Avenal Energy – Avenal Power Center, LLC	2008-AFC-1	1.4 ppm without duct burners; 2.0 ppm with duct burners (3-hour)
Watson Cogeneration Project	2009-AFC-1	2.0 ppm without duct burners (1-hour); 2.0 ppm with duct burners (1-hour)
Palmdale Hybrid Power Plant Project	SE 09-01	1.4 without duct burners (1-hour); 2.0 ppm with duct burners (1-hour)
Victorville Hybrid Gas-Solar	2007-AFC-1	1.4 ppm without duct burners; 2.0 ppm with duct burners
Colusa II Generation Station	2006-AFC-9	1.38 ppm without duct burners; 2.0 ppm with duct burners
FPL Turkey Point Power Plant	FL-0263	1.6 ppm without duct burners; 1.9 with duct burners
Plant McDonough Combined-cycle	GA-0127	1.0 ppm (1-hour) without; 1.8 ppm with duct burners (3-hour)
FPL West County Energy Center Unit 3	FL-0303	1.2 ppm with duct burners; 1.5 with duct burners
Gila Bend Power Generating Station	AZ-0038	1.4 ppm with duct burners
Liberty Generating Station	NJ-0043	1.0 ppm (no duct burners)
Empire Power Plant	NY-0100	1.0 ppm (no duct burners)
Fairbault Energy Park	MN-0053	1.0 ppm (3-hour) (no duct burners)
Oakley Generating Station	2009-AFC-4	1.0 ppm (1-hour) (no duct burners)
Sutter – Calpine	1997-AFC-02	1.0 ppm with duct burners (calendar day average)
Russell City Energy Center	2001-AFC-7	1.0 ppm with duct burners (1-hour)
CPV Warren	VA-0291	0.7 without duct burners; 1.6 with duct burners; (3-hour)
Warren County Facility	VA-0308	0.7 without duct burners; 1.0 with duct burners
Chouteau Power Plant	OK-0129	0.3 ppm (3-hour) with duct burners

Note: This table does not include all projects listed in the BACT databases. The purpose of this table is to present a summary of the most-stringent emission limits and to highlight any projects with an emission limit less than 1.0 ppm VOC identified during the database search.

Source: EPA RACT/BACT/LAER Clearinghouse and the CEC (EPA, 2012 and CEC, 2012).

BACT for PM-10

The FDOC and the PMPD propose to control PM10/PM 2.5 emissions to 9.5 lb/hr with duct burners. The Russell City energy Center has a 7.5 pounds per hour limit using duct burners which is substantially lower than the 9.5 lb/hr PM limit proposed for the HBEP.²¹ The 7.5 pounds per hour limit represents BACT for this

²¹ The Air District is therefore proposing a revised PM10/PM2.5 limit for each gas turbine/heat recovery boiler train of 7.5 lb/hr, or 0.00335 lb/MMBTU of natural gas fired, as the BACT limit for the

project since the Russell City Energy Center employs similar technology as the HBEP and has achieved this limit in practice.

District Rule 1325

The PMPD states that, *“District Rule 1325 requires a major PM2.5 facility to offset PM2.5 emissions at the offset ratio of 1.1:1. A major polluting facility is defined in the rule as a facility which has actual emissions, or a potential to emit of greater than 100 tons per year. HBEP is not a major PM2.5 facility because the total PM2.5 potential to emit of the facility would be 99.3 tons per year, which is less than the 100 tons per year threshold. Therefore, no PM2.5 offsets are required for HBEP.”* The PMPD is incorrect according to the AFC the project has the potential to emit 108 tons per year of PM 2.5²² therefore the project is required to provide PM 2.5 offsets and the FDOC and the PMPD violate district Rule 1325.

Secondary Particulate formation from Ammonia Emissions is a significant unmitigated impact under CEQA.

According to the AFC the Huntington Beach Project has the potential to emit 251.9 tons per year of ammonia.²³ AS the PMPD describes the project’s emissions of ammonia can contribute to the formation of secondary pollutants PM-10 and PM 2.5. It is well documented that ammonia emissions in the South Coast Air Quality Management District lead to the formation of secondary particulate. The SCAQMD has performed modeling for its rule 1105.1 that demonstrates that 1.5 tons of ammonia emitted can form from 1.5 tons to 6 tons of secondary particulate a day. SCAQMD has successfully defended its environmental analysis for its Rule 1105.1 in court²⁴ which demonstrated that 1.5 tons per day of ammonia, when released in the atmosphere would react with other pollutants to form between 1.5 tons per day and 6 tons per day of PM10. Potentially the projects ammonia emission could form as much as 251 to 1,511 tons of secondary particulate a year even with the a 5 ppm ammonia slip.

sources. http://www.baaqmd.gov/~media/Files/Engineering/Public%20Notices/2010/15487/PSD%20Permit/B3161_nsr_15487_psd-permit_020410.ashx?la=en Page 10

²² AFC Page 5.1-17

²³ AFC Appendix 5.1B

²⁴ Los Angeles County Superior Court (Case No. BS087190)

The project could potentially emit 108 tons per year of PM-10/PM 2.5.²⁵ The PMPD correctly states that the projects PM-10/PM2.5 emissions of 108 tons per year is cumulatively considerable and a significant impact. But the PMPD ignores the formation of secondary particulate from the projects 5 ppm ammonia slip which according to SCAQMD analyses will form as much as 251.9 tons to 1,511 tons of secondary particulate a year which is 2 to 15 times more PM-10/PM2.5 than directly emitted from the project. In order to comply with CEQA the secondary particulate formation must be mitigated.

Construction Emissions

The PMPD “ finds that particulate matter emissions from construction would cause a significant impact because they would cause new exceedances or contribute to existing violations of PM10 and PM2.5 ambient air quality standards, and additionally that those emissions can and should be mitigated to a level of insignificance. “As further mitigation, applicant proposes to sweep the Pacific Coast Highway 3.5 miles once per month for the duration of the construction period.” There is no evidence in the record to conclude that street sweeping the coastal highway once a month would mitigate daily impacts from PM 2.5 and PM-10 and street sweeping has absolutely no effect in lowering NOx, Sox and VOC emissions. In fact the street sweeping operations will increase NOx and PM emissions. The mitigation effectiveness of the street sweeping program has not been quantified and possibly may not be feasible due to traffic volumes on the Pacific coast Highway. CEQA requires mitigation measure be feasible and quantifiable. The evidence in the record is that the street sweeping program may not be feasible and currently has no method of quantifying the mitigations effectiveness which is a violation of CEQA.

The PMPD and the analyses in this proceeding fail to quantify the cumulative construction impacts of the Poseidon desalination plant constructing simultaneously with the HBEP construction which is expected to last 7 years. The PMPD recognizes the existence of the Poseidon Project²⁶ but provides no discussion of the cumulative air quality construction impacts.

²⁵ AFC Page 5.1-17

²⁶The only industrial facility near the HBEP is the proposed Poseidon project, a 50 million gallon per day (mgd) desalinization plant. The Poseidon project would not consume natural gas for its operation. (Ex. 2000, p. 5.3-8.) Thus, we find that there are nocumulative energy impacts from the HBEP.

Compliance Status of all Facilities in California SCAMD Rule 1305 and 2006 (g) (1)

The facility violates SCAQMD Rule 1303 (5) (B) “(B) Statewide Compliance which requires the applicant to:

Demonstrate prior to the issuance of a Permit to Construct, that all major stationary sources, as defined in the jurisdiction where the facilities are located, that are owned or operated by such person (or by any entity controlling, controlled by, or under common control with such person) in the State of California are subject to emission limitations and are in compliance or on a schedule for compliance with all applicable emission limitations and standards under the Clean Air Act.

AES owns and operates the Redondo Beach Project which has been a High Priority Violator of the clean air act for the last twelve quarters in a row according to the EPA.²⁷ Accordingly the air permit cannot be issued until the Redondo Beach facility comes into compliance with SCAQMD Rule 1303.

Hazardous Materials - Ammonia

The existing Huntington Beach power plant has a urea to ammonia conversion unit. Currently urea pellets are transported and converted to ammonia onsite at the power plant. Use of urea pellets eliminates the impacts of transportation and storage of large amounts of ammonia for use in the SCR. That is the current environmental baseline. The PMPD proposes to allow the use of a 19% aqueous ammonia solution which has dangerous transportation and storage impacts. CEC Staff recognizes these impacts and even the potential for impacts from seismic activity. *“An earthquake could also cause failure of the secondary containment system (berms and dikes), as well as the failure of electrically controlled valves and pumps. The failure of all of these preventive control measures might then result in a vapor cloud of hazardous materials that could move off site and affect residents and workers in the surrounding community.”*²⁸ Despite this risk the PMPD allows the use of aqueous ammonia degrading the existing environmental baseline and endangering the local community in violation of CEQA.

The storage of large amounts of aqueous ammonia also presents security issues related to terrorist attacks requiring additional security onsite to prevent such

²⁷ <http://echo.epa.gov/detailed-facility-report?fid=110014322170> EPA ECHO website.

²⁸ FSA Page 4.4-14

incidents. The use of urea pellets eliminates that risk. The PMPD should preserve the existing environmental baseline and prevent the transportation and use of aqueous ammonia and its acknowledged hazards.

Biological Impacts

The PMPD acknowledges the California Coastal commission comments on noise and wildlife impacts, *“The July 2014 Report suggests that we apply thresholds utilized by the California Department of Transportation after consultation with the USFWS and the California Department of Fish & Wildlife. These thresholds identify hearing damage and masking (the prevention or reduction of communication among birds) and are even more sensitive than those provided by Energy Commission staff. The July 2014 Report concludes by requesting that we impose greater restrictions in Condition of Certification*

BIO-9. (Ex. 4026, pp. 13-14.) *As we explained above, the weight of the evidence in this proceeding is that bird hearing differs from that of human beings. Because of that, we concluded that the low frequencies typical of construction activities would not adversely impact wildlife species. We therefore decline to implement the changes to Condition of Certification BIO-9—a Condition that we declined to impose in the first instance.*²⁹” The PMPD then summarily dismisses the coastal commission’s concerns based on the applicant’s testimony that birds are less sensitive to typical low frequency construction noise than humans. CEC Staff has provided credible evidence consistent with comments by USFWS and CCC. Staff evidence and conclusions about wildlife and power plant noise is consistent with staff testimony in other power plant siting cases:

“Studies have shown that elevated noise levels can affect the behavior of certain bird species and could interfere with acoustic communication (e.g., Dooling and Popper 2007). Noise may affect birds in several ways, including reducing reproductive success; raising the level of stress hormones; interfering with sleep; causing permanent injury to the auditory system; and interfering with acoustic communication by masking important sounds, such as an approaching predator (Halfwerk et al 2011; Dooling 2006; Kight and Swaddle 2011). Many bird species rely on vocalizations during the breeding season to attract a mate within their

²⁹ PMPD Page 5.1-31

territory. Francis et al. (2009) showed that noise alone reduced nesting species richness and led to a different composition of avian communities. Although some birds are able to shift their vocalizations to reduce the masking effects of noise, when shifts did not occur or were insignificant, masking could impair signaling and listening capabilities necessary for successful communication and survival (Barber et al. 2010).

Construction and demolition noise would occur over 7 ½ years in close proximity to the Magnolia Marsh, Upper Magnolia Marsh, and Wildlife Care Center. As shown in Biological Resources Table 3, average levels of construction and demolition noise could exceed ambient noise levels throughout Upper Magnolia Marsh and most of Magnolia Marsh. Although maximum construction noise levels are unknown, it is assumed that they are above average (Leq) levels. Pile driving is an example of an intermittent noise that would be particularly startling and disruptive to birds. Some areas of the marshes currently experience ambient noise levels above 60 dBA (a level often used by USFWS and CDFW as a threshold for disturbance to birds); it is expected that birds present in these areas have acclimated to elevated noise. However, construction and demolition would further increase noise levels in these areas, particularly sudden loud startling noises, and could result in the effects described above.”³⁰

The Energy Commission must comply with the Coastal Act as it must comply with any other state law. (Pub. Resources Code, § 30003. The provisions set out in the CCC 30143 (d) report are mitigation measures proposed by the State Agency in charge of coastal development. It is already reported by the coastal commission, that AES removed 3.5 acres of the existing wetlands without benefit of a coastal development permits. Now the Commission is allowing the applicant to further degrade the existing wetland which has recently been restored with a \$3.3 million injection of federal stimulus money recently awarded to the Conservancy.

Public Access Policies

Public Resources Code section 30211 provides: “Development shall not interfere with the public’s right of access to the sea where acquired through the use or legislative authorization, including, but not limited to, the use of dry sand and rocky coastal beaches to the first line of terrestrial vegetation.” The Coastal

³⁰ FSA Page 4.2-34,35

Commission Report asserts that public access will be adversely impacted by the use of beach parking for construction worker use. (Ex. 4026, pp. 2, 6-8.)³¹

The PMPD ignores the CCC and states,

*“The Coastal Commission would delete the use of the Huntington Beach City Parking area from the locations available for construction workforce parking, contending that use for the HBEP would impede public access. (Ex. 4026, pp. 4, 7, 35-36.) We disagree and decline to make the suggested change. Restrictions are already in place that mandate that the city beach parking facility not be used on the weekends or on major summer holidays. Accordingly, we conclude that this limitation on usage properly balances the need for construction parking with continued public access.”*³²

The Committee has deliberately chosen to ignore the Coastal Commission authority and allow a significant impact to public access to Huntington Beach. This is a clear violation of the MOU between the CEC and CCC and usurps the California Coastal Commission’s authority. Hopefully the full Commission will admonish the Committee and remind them that they are not the coastal commission and they must comply with the coastal act and its policies.

Power Plant Efficiency

The PMPD states, “ Under normal conditions, HBEP would burn natural gas at a nominal rate of approximately 7,427 million British thermal units (MMBtu) per hour, low heating value (LHV2), during baseload operation - a substantial rate of energy consumption that could potentially impact energy supplies under some conditions. Under expected project conditions, electricity would be generated at a full load efficiency of approximately 46 percent LHV. This efficiency level compares favorably with the average fuel efficiency of a typical baseload/load following combined cycle plant.

First of all the Energy Commission is well aware that combined cycle plants are compared on the higher heating value (HHV) to compare efficiency of natural gas power plants. As the FDOC states, “These turbines are not the most efficient units on the market when compared to other F and G class turbines.”³³ Even the Committee is hoping for an upgrade in technology to improve the efficiency of this

³¹ PMPD Page

³² PMPD Page 6.2-31,32

³³

power plant. “At the Scheduling Conference on April 8, 2014, the Committee asked how, given the long construction period, improved technology would be incorporated into the HBEP. This question was particularly addressed to power block 2, but applied to power block 1 as well.”³⁴ Most combined cycle plants are achieving heat rates far below the projected heat rate of the Huntington Beach Project. As shown below the HBEP is nowhere near the efficiency of modern combined cycle plants even those that were permitted over 10 years ago.

Average heat rate of current combined cycle power plants QFER 2013				
Project	2013 QFER Heat Rate ³⁵	Date Approved	% better than HBEP	Max Change GHG
Otay Mesa	6.75935482127901	4/18/01	21% - 31%	-619,266 MTCO ₂ /MWh
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³⁴ PMPD Page 2-8

³⁵ http://energyalmanac.ca.gov/electricity/web_qfer/Heat_Rates.php