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**Transphase's Post-Workshop Comments on the California Energy Commission's
Proposed Load Management Standards and Chairman Pfannenstiel's Proposed Revisions**

California Energy Commission Docket No. 08-DR-01

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December 19, 2008

Transphase Company, a thermal energy storage manufacturer, is pleased to offer these comments after the December 10, 2008 workshop on the “Draft Proposed Load Management Standards.” The undersigned attended the workshop in person, and offered specific comments on certain of Chairman Pfannenstiel’s Proposed Revisions to Draft Load Management Standards introduced before the workshop. Transphase also submitted comments on December 5, 2008 in advance of the workshop, as did Klaus Schiess, P.E. of KS Engineers, Mark MacCracken, P.E. of Calmac Manufacturing Corp. and Victor Ott, P.E. of Cryogel, all in support of thermal energy storage as a load management measure offering major benefits to all Californians.

These comments address Chairman Pfannenstiel’s proposed revisions and also some language in the body of the report.

Overall, Transphase is greatly in support of Chairman Pfannenstiel’s proposed revisions. In particular, as revised and proposed by the Chairman, LMS-2, Dynamic Electric Rates, is a positive and succinct statement of proper California energy policy in this important area. Transphase urges that the Chairman’s Revised Standard for LMS-2 be adopted exactly as proposed.

The Chairman’s proposed revision for LMS-6 is, in the main, a positive and helpful statement of California energy policy. However, there are some minor word changes which Transphase urges in order to remove possibility ambiguity to this standard. Below is the proposed revision by the Chairman, along with strike-outs and additions (in bold italicized)recommended by Transphase:

LMS-6.

Enabling Technology Adoption

Purpose: To provide customers who ~~have elected to~~ participate in a utility rate or demand response program with adequate information about the availability of technology ***and incentives*** that will facilitate responses.

Applicability: This standard will apply to all utilities that have installed AMI or offer demand response programs.

Provisions:

(1) Utilities that offer time-differentiated rate or demand response programs must provide customers with easy to understand information about

available technologies that will facilitate their response.

(2) The technologies may take any form, such as programmable communicating thermostats, pool pump controls, appliance controls, whole-home automation systems, and ***thermal energy storage systems will be readily available from retail sources***. The

PCD's shall follow the Reference Design summarized and cited in an appendix to this Standard.

(3) Utilities may ~~choose to~~ provide financial incentives for customers to take advantage of appropriate technologies.

(4) As the availability of relevant technologies is expected to increase significantly following installation of AMI and adoption of time-differentiated rates, the utilities must make a good faith efforts to update their information offerings and to maintain, on their websites, current listings of the available technologies.

Effective Date: Compliance with this standard will be enforceable six months after the Load Management Standards are filed with the Secretary of State.

Certainly, thermal energy storage is an important load management strategy which should be mentioned in this Standard (as it is in the body of the report). As LMS-6 is currently proposed, the lack of mention of TES, along with the language about availability from retail sources, could be interpreted as an indication that enabling technology only applies to that which could be purchased "readily" at retail, which is obviously not an accurate description of load management, such as TES or commercial/industrial building automation systems. In fact, the language could be interpreted as only applying to residential or small commercial measures. Also, the "choose to" language for utilities is not consistent with situations where the CPUC or other regulators require that they take certain action.

With respect to the body of the standards, in the section entitled "Enabling Technologies for Load-Shifting" at pages 48-49, we recommend and request the deletion/ strike-out of one clause in one sentence as well as the addition of two short paragraphs, as follows:

At pages 48-49 of the Energy Commission's proposed standards, it states:

"a thermal storage unit allows a building manager or homeowner to store cooling energy over night when electricity is inexpensive, and then use the stored energy to cool during the afternoon when prices are high. At the June 19 workshop, presenters described

some of these technologies, and Commissioners expressed support for the concept, ~~but indicated that there may be no need for a standard to address their market penetration at this time.~~ With all customers moving toward at least TOU rates under AMI, the value of such technologies to customers would appear to be increasingly attractive. Properly implemented, this enabling technology could be invisible to the building occupants and provide significant bill savings under a favorable pricing plan, while assisting the system overall by shifting load off-peak. The Committee recommends that utilities provide information about the potential for load shifting technologies to customers as they are moved onto dynamic rates.” [emphasis added]

In addition, shifting a kWh from on-peak to off-peak time periods will result in significant energy savings and emissions reductions at the power generation plants. Time-differentiated heat rates indicate energy conservation benefits from 20% to 45% at the power plants from shifting load. (Source Energy and Environmental Impacts of Thermal Energy Storage, February 1996, www.energy.ca.gov/reports/500-95-005_TES-REPORT.PDF at pages 24-32.) Further, line losses will be decreased as electricity transmission is shifted from on-peak to off-peak. (Source Energy and Environmental Impacts of Thermal Energy Storage, p.19)

Moreover, load shifting measures such as TES will be very useful in meeting California’s renewable portfolio standard (RPS). In general, wind energy supplies far more electricity during summer off-peak hours than during peak hours. (See, for example, <http://www.caiso.com/1ca5/1ca5a7a026270.pdf> and http://www.energy.ca.gov/pier/final_project_reports/CEC-500-2005-136.html.) Load shifting measures such as TES may assist in transforming off-peak wind energy into firm on-peak capacity and energy.

One clause is shown as a strike-out in the first paragraph above on page 48 of the Draft as current TOU rates are not truly cost-based. That clause implies that the Commission believes that incentives for load shifting are not necessary, without any factual support. In fact, as Transphase described in some detail in its December 5, 2008 pre-workshop comments, the rates have recently flattened and incentives are necessary. While Transphase is not asking this Commission to conclude that incentives are necessary, at the same time Transphase requests that this Commission not adopt a contrary “no incentives” position absent a detailed study to support such a position, *particularly where the LMS-6 standard allows for such incentives.*

As shown above, two paragraphs have been proposed to be added to this discussion. Again, as detailed in Transphase’s December 5, 2008 comments, Transphase has now received

utility responses to data requests at CPUC proceedings which fully document and support these statements. For example, with respect to time-differentiated heat rates:

SCE¹ and PG&E²

Power Plant Heat Rates (Btus/kWh)

	Summer		Winter	
	SCE	PG&E	SCE	PG&E
On-Peak	13,258	11,985	-----	-----
Mid-Peak	10,254	10,781	9,413	10,037
Off-Peak	7,263	7,603	6,996	7,742

For SCE, the summer off-peak heat rate is 45% less than the summer on-peak heat rate, which translates directly into a 45% reduction in fossil-fuel consumption at the power plant for every kWh shifted from on-peak to off-peak. For PG&E, the summer off-peak heat rate is 37% less than the summer on-peak heat rate, which translates directly into a 37% reduction in fossil-fuel consumption at the power plant for every kWh shifted from on-peak to off-peak.

¹ SCE's verbatim response to Transphase's data request:

Southern California Edison
2009 GRC Phase 2 A.08-03-002

DATA REQUEST SET TRANSPHASE-SCE-001

To: TRANSPHASE

Prepared by: Paul Nelson

Title: Senior Economist

Dated: 04/17/2008

Question 02:

In SCE's "Marginal Cost and Sales Forecast" Exhibit, I did not see any heat rate information using either the Incremental Energy Rate or Marginal Plant Rate method. (see pages 16 to 23 of this CEC report.) (If you have already included this information somewhere, I apologize in advance.) Would SCE be willing to provide such heat rate information as a means to test SCE's proposal and to better understand what differences might have led to such dramatic rate design changes coming out of the 2003 GRC, on the one hand, and the 2006 and SCE proposed 2009 GRC rate designs, on the other hand?

Response to Question 02:

The incremental energy rate can be calculated from Table I-7 and the average gas price of \$7.49 (SCE-2, page 24, line 7):

$$\text{IER (BTUs/KWH)} = \text{Energy Price (cents/KWH)} / \text{Gas Price (\$/MMbtu)} * 10,000$$

IER (Btus/KWH)

	Summer	Winter
On-Peak	13,258	-
Mid-Peak	10,254	9,413
Off-Peak	7,263	6,996

² See PG&E's Answer to Transphase's Question 15 in Transphase's Data Request, Set Two.

With respect to wind energy, SCE responded to a Transphase data request for a time-of-use breakdown for 2007 wind supply with the following table:

		Peak Period	2007 daily kWh		
			average	minimum	maximum
Summer	on		1,516,421	50,026	3,925,735
Summer	mid		2,752,099	142,544	6,377,746
Summer	off		4,592,979	47,424	15,122,855
Winter	mid		3,235,441	128,867	9,534,896
Winter	off		2,208,473	20,500	12,290,950

As shown, there is well more than three times as much wind energy supplied during summer off-peak as during summer on-peak. Thus, in addition to the CEC and CAISO references, there is more than sufficient ample documentation to support the statements proposed to be included.

That is it, as far as Transphase's comments are concerned. Transphase appreciates the opportunity to provide these comments and looks forward to the adoption of these extremely important Load Management Standards, for California, the country, and the world.

Respectfully submitted,

/s/

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