BEFORE THE PUBLIC UTILITIES COMMISSION

OF THE STATE OF HAWAII

---------In the Matter of--------	)	DOCKET NO. 2008-0273
	)	
PUBLIC UTILITIES COMMISSION	)	
	)	
Instituting a Proceeding to	)	
Investigate the Implementation of	)	
Feed-in Tariffs.	)	
	)	

THE DEPARTMENT OF BUSINESS, ECONOMIC DEVELOPMENT, AND TOURISM'S COMMENTS ON PROPOSED FEED-IN TARIFFS FOR TIER 3

AND

CERTIFICATE OF SERVICE

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THE DEPARTMENT OF BUSINESS, ECONOMIC DEVELOPMENT, AND TOURISM'S COMMENTS ON PROPOSED FEED-IN TARIFFS FOR TIER 3

The Department of Business, Economic Development, and Tourism ("DBEDT"), by and through its Director ("Director") in his capacity as the Energy Resources Coordinator ("ERC"), through the Hawaii State Energy Office, hereby submits to the Hawaii Public Utilities Commission ("Commission") its comments on the proposed Feed-in Tariffs for Tier 3 filed in the above captioned docket by Hawaiian Electric Company, Inc., Hawaii Electric Light Company, Inc., and Maui Electric Company, Limited, (collectively, the "HECO Companies" or "companies"), and its comments on the joint proposal by Clean Energy Maui LLC and Zero Emissions Leasing LLC.

INTRODUCTION

By Order Initiating Investigation filed on October 24, 2008, the Commission opened the above captioned docket to

examine the implementation of feed-in tariffs ("FIT") in the HECO Companies' service territories. On September 25, 2009, the Commission issued its decision and order which sets forth the general principles for the design and implementation of the initial FIT program for the HECO Companies. The general design principles of the initial FIT specified the eligible renewable resources and technologies, project sizes, program caps, determination of the FIT rates including the cost basis and rate structure; other eligibility requirements, and non-rate terms and conditions.

On October 29, 2009, the Commission issued its *Order Setting Schedule* for the remainder of this proceeding. On January 7, 2010, the HECO Companies filed their proposed FIT Tariffs for Tier 1 and Tier 2, followed by the filing of the Parties' comments on January 21, 2010 pursuant to the *Order Setting Schedule*. Following the Commission's approval of the Independent Observer's Contract by Order issued on January 29, 2010, the HECO Companies filed its report on queuing and interconnection procedures on February 1, 2010.

On February 8, 2010, the HECO Companies filed a *Report on Reliability Standards* ("HECO Reliability Report") in response to the Commission's directive to develop reliability standards for

each Company[1], followed by a letter filed on February 26, 2010 responding to the February 19, 2010 Commission's directive to clarify their proposal to defer implementation of the FIT program on MECO and HELCO. The Parties' comments on the aforementioned reports were filed on March 8, 2010 and March 23, 2010, respectively, in accordance with the *Order Setting Schedule*.

On April 29, 2010, the HECO Companies filed its proposed Schedule FIT Tier 3 Tariffs and Agreement pursuant to the docket schedule. Two other Parties, Clean Energy Maui LLC and Zero Emissions Leasing LLC, jointly filed their Proposed Tier 3 Tariffs on the same day.

DBEDT's comments on the HECO Companies' proposal and the Clean Energy Maui LLC and Zero Emissions Leasing LLC's joint proposal on FIT Tier 3 Tariffs are provided in the following sections.

DBEDT's COMMENTS

A. Implementation of FIT Tariffs

The HECO Companies support the full implementation of the FIT program on Oahu as soon as possible.[2] However, the companies proposed that implementation of FIT on HELCO and MECO systems -

[1] Docket No. 2008-0273. Commission Decision and Order, September 25, 2009, Page 50.

[2] HECO Companies Schedule FIT Tier 3 Tariffs and Agreement, April 29, 2010, pages 3-4.

both in terms of timing and scope - should be subject to review by the companies' proposed Reliability Standards Working Group as recommended in its February 8, 2010 Reliability Report.[3]

DBEDT supports the expeditious implementation of the full FIT program on Oahu (Tiers 1 to 3) as soon as possible. DBEDT however, does not agree to hold-off implementing the FIT Program on HELCO and MECO for reasons discussed and supported in DBEDT's March 23, 2010 comments on the HECO Reliability Report. DBEDT recommends that the Commission approve the expeditious implementation of the FIT program on all islands as necessary to achieve Hawaii's energy independence and security for the public's best interest.

B. Development of the Proposed Tier 3 FIT Rates

DBEDT observes that HECO was more open and willing to share information and collaborate with the Parties in the development of the proposed Tier 3 FIT energy payment rates. On March 10, 2010, HECO conducted a technical session with the Parties to discuss and solicit input from the Parties on its draft proposed Tier 3 FIT energy payment rates and shared an electronic copy of its LCOE model with the Parties. Following the technical session, the Parties exchanged information requests and some of the Parties had informal dialogues with the companies. HECO conducted another technical session with the Parties on April 21, 2010 to again solicit the

[3] Ibid. Page 5.

Parties' inputs.

DBEDT appreciates the HECO Companies' efforts in making the development of the proposed Tier 3 FIT energy payment rates as transparent and collaborative as possible. Notwithstanding this increased transparency and collaboration, DBEDT offers below its comments, observations, and recommendations on certain sections of the HECO Companies' proposed FIT Tier 3 Tariffs.

C. Proposed FIT Energy Payment Rates and Assumptions

1) Pursuant to the Commission's Order on general design principles, the HECO Companies' proposed FIT energy payment rates for Tiers 1-3 are based on Oahu rates and are the same for all HECO Companies (HECO, HELCO, MECO)[4] rather than differentiated by island. Also consistent with the Commission's general design principles, the HECO Companies' proposed rates included the existing renewable energy income tax credits in the determination of the proposed FIT rates. For solar energy systems, the income tax credit is 35% of the actual cost of the technology subject to certain caps as provided in Section 235-12.5(b) of the Hawaii Revised Statutes ("HRS"). The Hawaii statute, Section 235-12.5(g), HRS, also provides for a reduced credit for solar energy technology which may be claimed by a taxpayer who

[4] Wind generation is precluded on Maui and Hawaii island for Tier 3. PUC Decision and Order, September 25, 2010. Pages 44-45.

has no income tax liability. The HECO Companies' proposed FIT energy payment rates for PV and CSP are provided at both levels of the state income tax credits, which DBEDT supports and agrees with. The proposed FIT rates for all Tiers and qualified resources are summarized as follows:

TABLE 1 - HECO COMPANIES' PROPOSED FIT RATES

@35% Tax Credit	**TIER 1[a]** ¢/kWh	**TIER 2[a]** ¢/kWh	**TIER 3[b]** ¢/kWh
PV:	21.8	18.9	19.7
CSP:	26.9	25.4	31.6
On-shore Wind	16.1	13.8	12.0
In-line Hydro	21.3	18.9	11.1
@24.5% Tax Refund			
PV:	27.4	23.8	23.6
CSP:	33.2	27.5	33.6
On-shore Wind	N/A	N/A	N/A
In-line Hydro	N/A	N/A	N/A

[a] Filed on January 7, 2010.
[b] Filed on April 29, 2010.

2) The summary comparison of the proposed FIT energy payment rates by project type and project size (Tiers) in Table 1 shows that the CSP technology resource is the most expensive across all three Tiers. The proposed Tier 3 CSP rate is 31.6 ¢/kWh which is 60% higher than the PV rate of 19.7 ¢/kWh, and 163% higher than the on-shore wind rate of 12.0 ¢/kWh. As shown in Table 2 provided below, CSP has the highest installed cost due to higher equipment costs, and the highest operational and maintenance costs of all the FIT-qualified

resource technologies. DBEDT notes that the installed costs assumed by HECO do not even include the cost of thermo storage which could add value to the CSP technology over the PV systems.

HECO also noted this significant price premium for CSP over the other technologies and suggested that it may be a cause for consideration to establish an explicit limit to the number of megawatts of CSP allowed in the FIT program.[5] While the FIT program is viewed as one of the mechanisms that will help Hawaii to achieve its goal of energy independence, DBEDT believes that it is important and reasonable to take into consideration the impact of the FIT program on consumers. Thus, DBEDT does not object to the companies' suggestion of considering an explicit limit on the number of megawatts of CSP allowed in the initial deployment of the FIT program specifically for Tier 3 until the initial FIT review and update. DBEDT supports the inclusion of CSP projects without limit in the deployment of Tier 1 and Tier 2, as this would provide data for Hawaii-specific CSP projects for use in the initial FIT program review and evaluation.

3) As summarized in Table 1, the proposed FIT rates for on-shore wind starts at 16.1 ¢/kWh in Tier 1, and decreases to 13.8

[5] HECO Proposed Schedule FIT Tier 3 Tariffs and Agreement, April 29, 2010. Page 35.

¢/kWh in Tier 2 (a drop of 2.3 ¢/kWh or 14.3% reduction), and further decreases to 12.0 ¢/kWh in Tier 3. The differential between the proposed Tier 1 and Tier 3 rates is 4.1 ¢/kWh or 25.5%. This differential is due to the lower installed cost for the Tier 3 project size due to economies of scale. A comparison of the cost assumptions across the three Tiers for each resource is provided in Table 3a to Table 3d below. As noted in the companies' filing[6], the companies' proposed Tier 3 FIT rate for on-shore wind was based on five wind scenarios that "represent generic installations to provide a range of LCOE costs."[7] The companies' filing also acknowledged that "[T]here are hundreds of combinations of turbines, tower and site development and installation costs" and "[T]he scenarios are meant to be representative not all inclusive."[8] The companies then explained the assumptions used in the scenarios specifically those relating to capacity factors, turbine costs, and development and installation costs. DBEDT observes that despite the existence of HECO Companies' PPAs for wind power, the companies' referenced sources of data are all non-Hawaii data.

4) On May 12, 2010, the Commission issued its decision and order

[6] Ibid. Pages 24-27.
[7] Ibid. Page 24.
[8] Ibid.

approving HECO's purchase power agreement ("PPA") with Kahuku Wind Power for the purchase of as-available energy from the 30 megawatt wind farm project at a base purchase power rate of 19.9 ¢/kWh. This base rate includes a base price of $170/MWH ("Base Price"), a $1.23/MWH adder for each calendar year for the increases in the estimated cost of company-owned interconnection facilities, and an adder of $27.90/MWH for the Battery Energy Storage System ("BESS Adder"). The approved PPA provides for a 1.5% escalation for each calendar year for the Base Price and the BESS Adder.[9]

DBEDT observes that the PPA's Base Price of $170/MWH (17.0 ¢/kWh) is much higher than the FIT Tier 3 proposed rate for on-shore wind of 12.0 ¢/kWh. Additionally, this Base Price is escalated annually at 1.5% rate. DBEDT is uncertain as to whether there are costs included in the PPA's Base Price that are significantly higher than the costs assumptions used in the development of the companies' proposed FIT rates for On-shore Wind as to result in such a significant difference in the purchase energy rates, or whether or not HECO considered the cost assumptions used in this PPA in determining the reasonableness of the cost assumptions used in its proposed FIT rate for this

[9] Docket No. 2009-0176, Decision and Order, May 12, 2010. Page 22.

resource. DBEDT suggests that the Commission require the companies to provide a comparison of the cost basis for the PPA's Base Price and the cost assumptions used in the development of the FIT rates to assist the Commission in determining whether the proposed FIT rates are just and reasonable.

5) A summary comparison of the costs data used by HECO for each renewable resource technology for Tier 3 is provided in Table 2. The companies' proposed Tier 3 FIT Tariffs filed on April 29, 2010 included a description of the development of the proposed Tier 3 FIT energy payment rates, including the LCOE model in EXCEL spreadsheets. In reviewing the companies' filing, DBEDT observes some inconsistencies in the cost figures cited in the text description with the numeric data indicated in the tabular summaries included in the text. For instance, page 33 of the companies' filing states that the "total installed [cost] modeled ranges from $5500-$7800/kW" for the CSP technologies. However, the table on page 34 shows the installed costs inputs ranging from $5820-$7352/kW for 5 MW systems and from $7777-$8562/kW for 1 MW systems (or an overall range of $5820-$8562/kW). The same inconsistency is observed for the range of installed cost modeled for in-line hydro cited on page 36 and the numbers shown in the tabular summary on page 37. Additionally, some of these numbers cited in the text

description are also not consistent with the numbers used in the EXCEL spreadsheets filed by the companies as further discussed below.[10]

[10] See footnotes to Table 2.

TABLE 2: SUMMARY OF COST ASSUMPTIONS USED IN HECO COMPANIES' PROPOSED TIER 3 FIT RATES

Line#	Assumptions	PV	CSP	Wind	In-line Hydro
L1	**Size (kW)**	501 - 5000	501 - 5000	501 - 5000	501 - 5000
L2	Size (kW) by LCOE Scenario Models	2000 - 4000	1000 - 5000	1000 - 5000	500 - 2500
L3	**Capacity factor (%)**	**16 - 22**	**18 - 24**	28 - 36	50
L4	**Installed costs ($/kW)**	**4270 - 6110**	**5500 - 7850**	**4000 - 5000**	**1640 - 5195**
L5	Equipment and system costs ($/kW)	4000 - 5200	5535 - 7852	2000 - 2600	**1385 - 4616**
L6	Installation costs ($/kW)	n/a	n/a	1150 - 1500	434 - 1445
L7	Interconnection costs ($/kW)	200 - 400	**255 - 530**	255 - 530	**255 - 530**
L8	Permitting costs ($/kW)	20 - 40	30 - 150	100 - 500	**10 - 60**
L9	Permitting costs ($)	75000	35000 - 150000	15000 - 500000	2500 - 30000
L10	**Land costs ($/year)**	200000	10000 - 300000	4%	4%
L11	Land costs ($/acre)	5000 - 15000	**5000 - 15000**	4%	4%
L12	Land usage (acre/MW)	5 - 9	2 - 6	n/a	n/a
L13	**O&M ($/kW)**	17 - 22	**50 - 100**	25 - 40	60
L14	**Financing assumptions**				
L15	Debt percentage (%)	35	35	35	35
L16	Debt rate (%)	9	9	9	9
L17	Debt tenor (yrs.)	20	20	20	20
L18	Construction debt percentage (%)	80	80	80	80
L19	Construction debt rate (%)	11	11	11	11
L20	Construction debt term (mo.)	6	6 - 12	4 - 10	6 - 12
L21	Equity rate (%)	11	11	11	11
L22	**Proposed Rate (¢/kWh)**	19.7/23.6	31.6/33.6	12.0	11.1

References:

"A" Docket No. 2008-0273, Schedule FIT Tier 3 Tariffs and Agreement, April 29, 2010: henceforth referred to as "A" below.

"B" HECO Proposed FIT Tier 3 Tariffs, April 29, 2010 (Tab: Tier 3 Scenario Overview): henceforth referred to as "B" below.

L3 PV: "A" (p. 20) differs from "B" (16% - 22.70%); CSP: "A" (p. 29) differs from "B" (19% - 23%).

L4 PV: "A" (p. 22) differs from "B" ($4330 - $5600/kW); CSP: "A" (p. 33) differs from "B" ($5820 - $8562/kW); Wind: "A" (p. 27) differs from "B" ($4049 - $4983/kW); Hydro: "A" (p. 36) differs from "B" ($1687 - $5736/kW).

L5 Hydro: "A" (p. 36) differs from "B" ($951 - $3171/kW).

L7 CSP: "A" (p. 33) differs from "B" ($255 - $560/kW); Hydro: "A" (p. 36) differs from "B" ($290 - $1060/kW).

L8 Hydro: "A" (p. 36) differs from "B" ($12 - $60/kW).

L11 CSP: "A" (p. 12) differs from "B" ($20000 - $300000/acre).

6) As noted in HECO's filing[11], there was a discussion among the Parties as to whether or not to include and provide proposed Tier 3 rate for in-line hydro, given the lack of data appropriate for Tier 3 size for this resource. As HECO noted, the required project pipe diameters estimated for Tier 3 size in-line hydro projects are not presently available, and the companies suggested that the Commission may wish to consider deferring Tier 3 size in-line hydro project eligibility until the first FIT program review and update. Notwithstanding the lack of data and the uncertainty of the availability of Tier 3 size in-line hydro projects in the future, the HECO Companies provided a proposed FIT Tier 3 energy payment rate for in-line hydro of 11.1 ¢/kWh pursuant to the Commission's Order.

DBEDT observes that if the Commission decides to keep in-line hydro an eligible resource technology in Tier 3, a FIT baseline rate will be set at 11.1 ¢/kWh in accordance with the Commission's September 25, 2009 Order which sets forth the general principles for FIT rates design. If Tier 3 size in-line hydro is deferred until the first FIT review and update, the baseline rate will be set at 12.0 ¢/kWh, only slightly higher than the in-line hydro Tier 3 rate. DBEDT

[11] HECO Companies Proposed Schedule FIT Tier 3 Tariffs and Agreement, April 29, 2010. Pages 5-6.

supports deferring the Tier 3 size in-line hydro eligibility until more appropriate data become available for rate development for this resource technology. Such deferral will not preclude any in-line hydro project or other RPS-eligible projects that meet the project size eligibility requirement from participating in the FIT program baseline rate.

7) DBEDT joins the HECO Companies in requesting clarification as to the Commission's Order relating to the establishment of baseline rate.[12] The question which was raised during the April 21, 2010 HECO technical session with the Parties was whether there will be one baseline rate for the entire FIT program based on the lowest FIT rate across all three Tiers, or whether a baseline rate will be established for each Tier based on the minimum rate in the respective Tiers. The relevant Commission's Order states "[T]he baseline rate shall equal the lowest specified FIT rate for any given project size."[13]

8) As observed in Table 1 and as noted on HECO's filing[14], some of the proposed Tier 3 prices are higher than those for Tier 1 and Tier 2. For instance, the companies' proposed Tier 3 FIT rate for PV (19.7 ¢/kWh) is slightly higher than the proposed Tier 2 rate (18.9 ¢/kWh). As discussed above, the proposed Tier 3

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[12] Ibid. Page 38.
[13] Commission's Decision and Order, September 25, 2009. Page 36.
[14] Ibid. Page 20.

FIT rate for CSP (31.6 ¢/kWh) is significantly higher than the Tier 2 rate (25.4 ¢/kWh). The HECO Companies indicate that this "reverse economies of scale in Hawaii" is due to the fact that there are additional project development costs for Tier 3 project sizes that offset the economies of scale in the capital costs. One such cost identified by HECO is the land costs. DBEDT observes that another major project development cost for Tier 3 projects is the interconnection costs which are not included in the Tier 1 and Tier 2 proposed FIT rates.

The following Tables 3a-3d provide summary comparisons of the data inputs used by HECO to better understand the reasons for the differences between the proposed FIT energy payment rates for Tiers 1-3 for each FIT-qualified resource.

9) Similar to the costs comparisons assumed for each resource technology for Tier 3 provided in Table 2, DBEDT observes that there are also some discrepancies in some of the Tier 1 and Tier 2 cost assumptions cited in the companies' proposed Tier 1 and Tier 2 FIT rates filed on January 7, 2010 and the data filed on January 21, 2010. Some differences are simply due to rounding, but some are quite significant such as the Tier 2 figures for the installed cost for Tier 2 CSP shown in Table 3b. As footnoted in Table 3b, pages 10-11 of the companies' January 7, 2010 filing cited the range of CSP installed costs modeled between $7400-$10500/kW while the range

used in the spreadsheet model filed on January 21, 2010 was $7135-$9576/kW. The same is observed for Tier 2 in-line hydro cost assumptions summarized in Table 3d where the upper bound of the installed costs cited in the January 7, 2010 filing was $9000/kW compared to $7250/kW in the spreadsheet model filed on January 21, 2010.

TABLE 3a. SUMMARY OF COSTS ASSUMPTIONS USED FOR PROPOSED TIER 3 FIT RATES FOR PV

Assumptions	Tier 1	Tier 2	Tier 3
Size (kW)	0 - 20	21 - 500	501 - 5000
Size (kw) by LCOE Scenario Models	20	500	2000 - 4000
Capacity factor (%)	15.98 - 17.12	16 - 17	16 - 22
Installed costs ($/kW)	5760 - 7040	5130 - 6310	4270 - 6110
Equipment and System costs ($/kW)	5760 - 7040	5130 - 6310	4000 - 5200
Installation costs ($/kW)	n/a	n/a	n/a
Interconnection costs ($/kW)	n/a	n/a	200 - 400
Permitting costs ($/kW)	n/a	n/a	20 - 40
Permitting costs ($)	n/a	n/a	75000
Land costs ($/yr)	200	5000	200000
Land costs ($/acre)	n/a	n/a	5000 - 15000
Land usage (acre/MW)	n/a	n/a	5 - 9
O&M ($/kW/year)	22.50 - 27.50	17 - 22	17 - 22
Financing assumptions			
Debt percentage (%)	35	35	35
Debt rate (%)	9	9	9
Debt tenor (yrs.)	20	20	20
Construction debt percentage (%)	n/a	n/a	80
Construction debt rate (%)	n/a	n/a	11
Construction debt term (mo.)	n/a	n/a	6
Equity rate (%)	11	11	11
Proposed Rate (¢/kWh)	21.8/27.4	18.9/23.8	19.7/23.6

References:

Tier 1: Docket No. 2008-0273, Schedule FIT Tier 1 and Tier 2 Tariff and Agreement, January 7, 2010, p. 7.
Docket No. 2008-0273, Comments on Alternative FIT Tariff and Agreement, January 21, 2010, Attachment 4, p. 59.

Tier 2: Docket No. 2008-0273, Schedule FIT Tier 1 and Tier 2 Tariff and Agreement, January 7, 2010, p. 8.
Docket No. 2008-0273, Comments on Alternative FIT Tariff and Agreement, January 21, 2010, Attachment 4, p. 70.

Tier 3: Refer to Table 2.

TABLE 3b. SUMMARY OF COSTS ASSUMPTIONS USED FOR PROPOSED TIER 3 FIT RATES FOR CSP

Assumptions	Tier 1	Tier 2	Tier 3
Size (kW)	0 - 20	21 - 500	501 - 5000
Size (kw) by LCOE Scenario Models	20	25 - 500	1000 - 5000
Capacity factor (%)	21 - 23	21 - 23	18 - 24
Installed costs ($/kW)	**8500 - 10600**	**7400 - 10500**	5500 - 7850
Equipment and system costs ($/kW)	n/a	n/a	5535 - 7852
Installation costs ($/kW)	n/a	n/a	n/a
Interconnection costs ($/kW)	0	0	255 - 530
Permitting costs ($/kW)	n/a	n/a	30 - 150
Permitting costs ($)	n/a	n/a	n/a
Land costs ($/year)	60 - 1200	500 - 30000	10000 - 300000
Land costs ($/acre)	n/a	1000 - 175000	5000 - 15000
Land usage (acre/MW)	n/a	n/a	2 - 6
O&M ($/kW/year)	n/a	50 - 80	50 - 100
Financing assumptions			
Debt percentage (%)	35	35	35
Debt rate (%)	9	9	9
Debt tenor (yrs.)	20	20	20
Construction debt percentage (%)	n/a	n/a	80
Construction debt rate (%)	n/a	n/a	11
Construction debt term (mo.)	n/a	n/a	6 - 12
Equity rate (%)	11	11	11
Proposed Rate (¢/kWh)	26.9/33.1	25.4/27.5	31.6/33.6

References:

Tier 1: Docket No. 2008-0273, Schedule FIT Tier 1 and Tier 2 Tariff and Agreement, January 7, 2010, p. 10-11.
Docket No. 2008-0273, Comments on Alternative FIT Tariff and Agreement, January 21, 2010, Attachment 4, p. 4.
"Installed costs ($/kW)" in model on p. 4 lists range of $8505 - $10646/kW which differs from range in text on p. 10.

Tier 2: Docket No. 2008-0273, Schedule FIT Tier 1 and Tier 2 Tariff and Agreement, January 7, 2010, p. 10-11.
Docket No. 2008-0273, Comments on Alternative FIT Tariff and Agreement, January 21, 2010, Attachment 4, p. 15.
"Installed costs ($/kW)" in model on p. 15 lists range of $7135 - $9576/kW which differs from range in text filing on p. 10.

Tier 3: Refer to Table 2.

TABLE 3c. SUMMARY OF COSTS ASSUMPTIONS USED FOR PROPOSED TIER 3 FIT RATES FOR WIND

Assumptions	Tier 1	Tier 2	Tier 3
Size (kW)	0-20	21 - 500	501 - 5000
Size (kW) by LCOE Scenario Models	1 - 20	25 - 100	1000 - 5000
Capacity factor (%)	26 - 32	28 - 39	28 - 36
Installed costs ($/kW)	**5000 - 7000**	**5000 - 6500**	4000 - 5000
Equipment and system costs ($/kW)	3250 - 4200	3100 - 3600	2000 - 2600
Installation costs ($/kW)	1200 - 2000	1200 - 2000	1150 - 1500
Interconnection costs ($/kW)	100 - 200	275 - 325	255 - 530
Permitting costs ($/kW)	100 - 200	150 - 300	100 - 500
Permitting costs ($)	n/a	n/a	15000 - 500000
Land costs ($/year)	**4%**	**4%**	**4%**
Land costs ($/acre)	**4%**	**4%**	**4%**
Land usage (acre/MW)	n/a	n/a	n/a
O&M ($/kW/year)	25 - 45	25 - 40	25 - 40
Financing assumptions			
Debt percentage (%)	35	35	35
Debt rate (%)	9	9	9
Debt tenor (yrs.)	20	20	20
Construction debt percentage (%)	n/a	n/a	80
Construction debt rate (%)	n/a	n/a	11
Construction debt term (mo.)	n/a	n/a	4 - 10
Equity rate (%)	11	11	11
Proposed Rate (¢/kWh)	16.1	13.8	12.0

References:

Tier 1 Docket No 2008-0273, Schedule FIT Tier 1 and Tier 2 Tariff and Agreement, January 7, 2010, p 8-9
Docket No 2008-0273, Comments on Alternative FIT Tariff and Agreement, January 21, 2010, Attachment 4, p 108
"Installed costs ($/kW)" in model on p 4 lists range of $4966 - $7008/kW which differs from range in text on p 9.

Tier 2: Docket No 2008-0273, Schedule FIT Tier 1 and Tier 2 Tariff and Agreement, January 7, 2010, p 8-9.
Docket No 2008-0273, Comments on Alternative FIT Tariff and Agreement, January 21, 2010, Attachment 4, p 122.
"Installed costs ($/kW)" in model on p. 15 lists range of $5009 - $6555/kW which differs from range in text filing on p. 9.

Tier 3: Refer to Table 2.

TABLE 3d. SUMMARY OF COSTS ASSUMPTIONS USED FOR PROPOSED TIER 3 FIT RATES FOR IN-LINE HYDRO

Assumptions	Tier 1	Tier 2	Tier 3
Size (kW)	0 - 20	21 - 500	501 - 5000
Size (kW) by LCOE Scenario Models	15 - 20	25 - 100	500 - 2500
Capacity factor (%)	50	50	50
Installed costs ($/kW)	4000 - 9000	2000 - 9000	1640 - 5195
Equipment and system costs ($/kW)	n/a	n/a	1385 - 4616
Installation costs ($/kW)	n/a	n/a	434 - 1445
Interconnection costs ($/kW)	n/a	n/a	255 - 530
Permitting costs ($/kW)	n/a	n/a	10 - 60
Permitting costs ($)	n/a	n/a	2500 - 30000
Land costs ($/year)	4%	4%	4%
Land costs ($/acre)	4%	4%	4%
Land usage (acre/MW)	n/a	n/a	n/a
O&M ($/kW/year)	50	50	60
Financing assumptions			
Debt percentage (%)	35	35	35
Debt rate (%)	9	9	9
Debt tenor (yrs.)	20	20	20
Construction debt percentage (%)	n/a	n/a	80
Construction debt rate (%)	n/a	n/a	11
Construction debt term (mo.)	n/a	n/a	6 - 12
Equity rate (%)	11	11	11
Proposed Rate (¢/kWh)	21.3	18.9	11.1

References:

Tier 1: Docket No 2008-0273, Schedule FIT Tier 1 and Tier 2 Tariff and Agreement, January 7, 2010, p. 9-10
Docket No 2008-0273, Comments on Alternative FIT Tariff and Agreement, January 21, 2010, Attachment 4, p 81.

Tier 2: Docket No 2008-0273, Schedule FIT Tier 1 and Tier 2 Tariff and Agreement, January 7, 2010, p. 9-10
Docket No. 2008-0273, Comments on Alternative FIT Tariff and Agreement, January 21, 2010, Attachment 4, p 93, 98, 106.
"Installed costs ($/kW)" in model on p. 15 lists range of $2000 - $7250/kW which differs from range in text filing on p. 10.

Tier 3: Refer to Table 2.

10) As discussed in HECO's filings, Hawaii-specific data is not available for most of the cost assumptions required in developing the proposed FIT rates. Absent Hawaii-specific data, HECO relied heavily on California-based data that were adjusted to reflect Hawaii conditions, such as the use of the Hawaii income tax credit, a labor cost adjustment, and the inclusion of freight costs. HECO's use of California data is consistent with the Commission's Order on the general principles for FIT design which provided that while the preferred cost data is the cost of Hawaii-based or Hawaii-specific projects, to the extent that Hawaii-specific cost data is not available, secondary data sources for industry costs adjusted to reflect the Hawaii market, may be utilized.[15] However, the Commission's Order also encourages the use of existing Hawaii PPAs and accepted competitive bids to evaluate the reasonableness of cost-based rates, further indicating that the utility already possesses information about the rates for existing PPAs and accepted competitive bids. The HECO Companies claimed that they "have examined both existing PPAs and accepted competitive bids and determined that their proposed rates are not <u>inconsistent</u> with PV rates contained in

[15] Commission's September 25, 2009 Decision and Order. Page 83.

existing agreements and proposals.[16] DBEDT observes that the proposed rates not being inconsistent with existing PPAs or accepted bids does not necessarily mean that the cost assumptions are reasonable. DBEDT also notes that the companies' reference to the existing agreements and proposals was only in relation to the PV rates despite the existence of PPAs for wind power as discussed above. Notwithstanding these observations, DBEDT recognizes the near absence of publicly available cost data for Hawaii-specific projects for the FIT-qualified resource technologies and project sizes.

11) The development of the companies' proposed Tier 3 FIT energy payment rates included interconnection costs for four main interconnection cost categories, including (1) interconnection requirements study ("IRS"), (2) supervisory control and data acquisition ("SCADA") and Direct Transfer Trip including communication equipment, (3) line extensions, and (4) transformers, breakers and protective relays. The interconnection costs considered in the rate development ranged from $530,000 for projects up to 1 MW to $1,275,000 for projects up to 5 MW[17], based on the companies' estimates and equipment manufacturers' quotes for transformers. HECO did not provide the workpapers showing the determination of these

[16] Ibid. Page 38.
[17] Ibid. Pages 10-11.

interconnection costs, and DBEDT recommends that the Commission require the companies to provide the workpapers.

In reviewing the companies' proposed *SCHEDULE FIT STANDARD AGREEMENT FOR TIER 3*, DBEDT is uncertain as to whether the interconnection cost ranges assumed in the development of the FIT rates cover most or all of the costs of interconnection facilities that are required to be borne by the seller. For instance, Attachment B to the proposed *SCHEDULE FIT STANDARD AGREEMENT FOR TIER 3* provides a detailed list and description of the seller-owned interconnection facilities that will be borne by the seller, including but not limited to metering equipments including all conduits and accessories, curtailment control interface, telephone lines, and substation (if required). In addition, Attachment G lists the company-owned interconnection facilities that will be paid for by the seller, including the *cost of Company personnel* for reviewing the construction plan for company-owned interconnection facilities. Furthermore, Section 6.3 of the standard agreement form requires the seller to install at its own cost, instrumentation to measure wind and solar radiation for forecasting purposes. Absent the workpapers showing the determination of the interconnection cost ranges assumed in the Tier 3 FIT energy payment rates, DBEDT is unable to ascertain whether or not it covers the total interconnection costs borne by the seller, or

what fraction of the total interconnection costs is covered in the proposed FIT rates.

With regards to the requirement for the seller to pay for the cost of HECO personnel, DBEDT notes that since HECO's labor cost (personnel cost) is embedded and recovered in the company's base rates, and in anticipation of the increased company personnel hours that may be required in performing such above mentioned tasks, including preparing IRSs (paid for by the seller), the treatment of the company personnel costs paid for by the seller need to be clarified for ratemaking purposes.

D. Proposed SCHEDULE FIT TIER 3 Tariffs Provisions

The following comments apply to the proposed Schedule FIT Tier 3 Tariffs for HECO, HELCO, and MECO:

1) The "Availability" clause provided in Section A of the proposed tariff specifies who can participate under this tariff. DBEDT recommends that this clause should also specify who are not eligible to participate under this tariff pursuant to the Commission's Order on design principles, such as renewable energy projects owned by the utility or its affiliates.

2) Section C of the proposed tariff provides the prioritization of participants "on a queue basis as determined by the Company with the concurrence of the Independent Observer..." DBEDT recommends that the process for the ranking of projects that are in the queue as well as the process for determining the

"queue capacity" for each "subscription period" should be explicitly stated in the tariff. DBEDT understands that such processes have yet to be determined. DBEDT however, would like some clarification from the Commission as to whether or not the Parties in this docket will be able to comment on such processes once determined and filed for Commission approval.

3) Section E of the proposed tariff provides that "[S]ellers selected to participate under this Schedule FIT shall complete and sign the standard Schedule FIT Agreement..." DBEDT is uncertain as to who and how sellers will be selected, or why "sellers" will need to be selected in light of the eligibility requirements - both resource type and project size - already prescribed by the Commission and provided in Section B of the proposed tariff. Additionally, the word "seller" is not defined in the proposed tariff or in the standard agreement form.

4) Section L of the proposed tariff provides the required fees and deposits including: (1) a non-refundable Application Fee, (2) a refundable Reservation Fee of $15/kW, (3) an Operating Period Security of $40/kW, and (4) a Service Charge of $25/month. DBEDT notes that except for the $25/month service charge, the HECO Companies do not have basis or supporting workpapers for

all these required fees and charges.[18] In regards to the Service Charge, the HECO Companies' response to DBEDT/HECO-IR-7 shows that this charge is based on the "estimated cost of $2000/meter" and a discount rate of 8.58%. DBEDT is uncertain whether or not the "$2000/meter" is only the cost of a meter or whether it refers to the total installed cost of a meter. DBEDT also notes that HECO did not provide the basis for the 8.58% discount rate shown in the HECO Companies response to the referenced IR. Further, if this monthly charge is based on the cost of a meter and yet the seller is required to pay for the metering cost, DBEDT believes that this may represent an over and possibly a double recovery of the same metering cost.

5) In regards to the refundable Reservation Fee, DBEDT recommends that the tariff explicitly provides the conditions under which this fee may be forfeited by the seller and indicate whether the fee will be refunded with interest and the interest rate that will be applied.

6) As in DBEDT's January 21, 2010 comments to the HECO Companies' proposed Tier 1 and Tier 2 FIT Tariffs filed on January 7, 2010, DBEDT recommends that the following non-rate terms and conditions be explicitly specified in the Tier 3 FIT Tariffs. These non-rate terms are consistent with the Commission's

[18] See HECO Companies' Responses to DBEDT/HECO-IR-4, DBEDT/HECO-IR-5, and DBEDT/HECO-IR-6 that were filed on April 22, 2010.

September 25, 2009 Order on the general FIT design principles.

a) The Company's total purchases of power under this Schedule is limited to a total capacity of _____ kilowatts (____ MW), or 5% of the Company's 2008 system peak load. This cap is based on the nameplate capacity rating of the Eligible Renewable Energy Generating Facilities in the FiT Program and will apply for the FiT Program's initial two years prior to the first periodic evaluation of the FiT Program. Of the total power purchases under the FiT Program, _____ kW or 5% is reserved for power purchases from qualifying FiT projects with capacity sizes under 20 kW (Tier 1 projects).

b) A generating facility utilizing RPS-eligible resources or technologies other than those eligible under this Schedule with nameplate rating capacity sizes not exceeding the lesser of 5 MW or 1% of the Company's 2008 system peak load, may apply in the FiT Program to sell power to the Company under the Baseline FiT Rate set forth in this Schedule, and subject to all applicable Terms and Conditions of this Schedule.

c) This Schedule may apply to incremental capacity addition to an existing Eligible Renewable Energy Generating Facility under the FiT Program, provided that such incremental capacity addition is separately metered as a stand-alone project and is subject to the eligibility requirements and terms and conditions of this Schedule.

d) All Eligible Renewable Energy Generating Facilities with capacity sizes greater than 20 kW (Tier 2 and Tier 3 projects) shall file the following information to the Public Utilities Commission under protective order, within 30 days after the facility commences operation:

1) The cost of project design, permitting, and construction costs, including labor and materials costs;
2) Financing or capital cost;
3) Land cost or actual cost of site acquisition;
4) Interconnection and metering costs incurred by the project developer;

5) Other project costs incurred in developing and constructing the project;
6) Tax credits, rebates, incentives received and applied to the project development cost;
7) Maintenance and operation labor and non-labor costs;
8) Fuel supply costs (for biomass and biogas projects);
9) Monthly land or site leases; and
10) Other operations and maintenance costs.

e) All Eligible Renewable Energy Generating Facilities with capacity sizes greater than 20 kW (Tier 2 and Tier 3 projects) must file an annual report with the Public Utilities Commission no later than January 31 of each year, containing the following information:

1) Annual electricity production in kilowatt-hours (kWh); and
2) Annual Operating costs, including operations and maintenance costs, lease expense, insurance, and property taxes.

f) At the end of the contract term, the utility will have no obligation to purchase power from the Eligible Renewable Energy Generating Facility. To exercise its option to purchase, the Company must provide a written notice to the Facility owner at least six months before the end of the contract term.

g) If an Eligible Renewable Energy Generating Facility is sited in a customer location receiving service from the Company, the energy delivered to the customer by the Company will be metered separately from the energy delivered to the Company by the Eligible Renewable Energy Generating Facility, either by use of multiple meters or a meter capable of separately recording the inflow and outflow of electricity. Energy delivered to the customer by the Company shall be billed under the Company's applicable rate schedule.

E. SCHEDULE FIT STANDARD AGREEMENT FOR TIER 3

1) Article 6, Section 6.1 of the proposed standard agreement form requires the seller "to provide a forecast of each month's

average-day electric energy production, by hour, for the following calendar year … including an expected range of uncertainty based on historical operating experience … " Section 6.2 requires at 0900 hour each Sunday of the week, the seller shall provide "an hourly forecast of deliveries for each hour of the day for the ensuing week (Monday-Sunday)". The companies did not provide the basis for the need for such a requirement that could require the companies as well as the seller to have a huge database system to receive, manage, store, analyze and use the data. The requirement for the weekly forecast on an hourly basis required under Section 6.1 alone, translates to a minimum of 8760 data points a year per seller. In addition to these annual and weekly forecasts, Section 6.3 requires the seller to provide the data (inputs) and information required for the companies to conduct their own forecasts. Again, no basis was provided by the companies for such a requirement.

2) Article 6, Section 6.4 requires the seller to install, at its own costs, instrumentations to measure wind or solar radiation for forecasting purposes. The companies did not provide estimated costs for such requirement nor did the companies include any such costs in the development of the proposed Tier 3 purchase energy rates for PV, CSP, and On-Shore wind.

3) Similar to the companies' proposed Tier 1 and Tier 2 FIT Tariffs filed on January 7, 2010, Article 8, Section 8.2 of the proposed standard agreement form provides that the "Company shall not be required to purchase electric energy during any period during which, due to operational circumstances, purchases from Seller will result in costs greater than those which the Company would incur if it did not make those purchases, but instead generated an equivalent amount of electric energy itself." This provision appears to link the FIT rates with HECO's fossil fuel-based avoided costs, and therefore, violates Section 269-27.2(c), HRS, (Act 050,SLH 2009). DBEDT objects to this provision and strongly recommends that it be excluded from any FIT Tariff Agreement that may be adopted and approved by the Commission for the following reasons:

a. HECO's proposed provision violates the Hawaii statute that delinks the determination of a just and reasonable purchase power rate for non-fossil fuel-generated electricity from the utility's avoided cost;

b. HECO's proposed provision is not consistent with the Commission's Order on general principles;

c. HECO's proposed provision will create uncertainty to the seller's revenue stream;

d. This provision will increase the potentials for curtailments of renewable generation from FIT resources, resulting in reduced revenues to the sellers which is not factored into the determination of the proposed FIT purchased energy payment rates;

e. HECO's proposed provision does not provide for a verification process for its cost estimate by either the Seller or the Commission;

f. HECO's proposed provision is contrary to the intent and goal of the FiT program to promote and accelerate the use and development of renewable energy, and will instead perpetuate the utility's dependence on imported fossil fuel.

g. The HECO Companies' response to DBEDT/HECO-IR-11a indicated the Company will determine its so called "negative avoided cost" using basically the same method used to determine its avoided costs filed with the Commission on a monthly basis, although the Company noted in its response to DBEDT/HECO-IR-11c that it has not presented such method for determining "negative avoided cost" to the Commission for approval. Thus, DBEDT believes that inclusion of this "negative avoided cost"

provision in the FIT standard agreement without knowing how it will be measured is unfair to the seller and will create significant uncertainty in the market that could negatively impact the FIT program.

h. Section 8.2 bases this "negative avoided cost" provision on the FERC regulation 18 CFR § 292.304(f) and the Hawaii Administration Rule ("HAR") § 6-74-24 of the Standards for Small Power Production and Cogeneration issued by the PUC. DBEDT notes that these regulations apply to the regulation of sales and purchases between qualifying cogeneration <u>or</u> small power producing facilities and electric utilities under PURPA, and the companies failed to demonstrate why the specific sections of these regulations they cited should apply to the FIT program established by the Commission.

4) Section 8.3 provides that the Seller will not be required to curtail, interrupt, or reduce deliveries of electric energy based on the Company's economic dispatch, such as when the Company's avoided cost is lower than the FIT purchase energy payment rate. DBEDT observes that this provision appears inconsistent with Section 8.2, which

provides that the Company is not required to purchase based on negative avoided costs.

5) DBEDT recommends that the proposed Section 28.3 of the standard agreement form[19] be modified to read as follows:

> "28.3 The provision of this Article 28 (Dispute Resolution) shall not apply ***to any agency of the State of Hawaii*** or to any disputes within the authority of an Independent Evaluator under Article 23…"

6) Section 30.18 states that "[T]he Parties agree that the terms and conditions of this Agreement are the result of negotiations between the Parties…" DBEDT views this provision as inaccurate as these terms and conditions are developed and proposed in its entirety by the HECO Companies.

[19] HECO Companies' Proposed Schedule FIT Standard Agreement for Tier 3. Page 59. Proposed change is bolded and in italics.

DBEDT's COMMENTS ON THE SCHEDULE FIT PROPOSED BY CLEAN ENERGY MAUI LLC AND ZERO EMISSIONS LEASING LLC

On April 29, 2010, Clean Energy Maui LLC and Zero Emissions Leasing LLC also filed a joint proposal for FIT Tier 3 Tariffs for the HECO Companies ("Joint Proposal"). Table 4 below provides a summary of the Joint Proposal as compared with the HECO Companies' proposal.

TABLE 4. SUMMARY COMPARISON OF PROPOSED TIER 3 FIT RATES

Tier 1:	**HECO Companies**	**Clean Maui/ Zero Emissions (Jan 1, 2010)**	**Clean Maui/ Zero Emissions (Apr 29, 2010)**
PV:	21.8 ¢/kWh	25.4 ¢/kWh	25.400 ¢/kWh
CSP:	26.9 ¢/kWh	47.7 ¢/kWh	36.243 ¢/kWh
On-shore Wind	16.1 ¢/kWh	33.4 ¢/kWh	35.525 ¢/kWh
In-line Hydro	21.3 ¢/kWh	13.2 ¢/kWh	-
Tier 2:			
PV:	18.9 ¢/kWh	22.74 ¢/kWh	22.740 ¢/kWh
CSP:	25.4 ¢/kWh	48.35 ¢/kWh	44.009 ¢/kWh
On-shore Wind	13.8 ¢/kWh	24.80 ¢/kWh	25.000 ¢/kWh
In-line Hydro	18.9 ¢/kWh	7.06 ¢/kWh	-
Tier 3:			
PV:	19.7 ¢/kWh	19.74 ¢/kWh	19.000 ¢/kWh
CSP:	31.6 ¢/kWh	48.35 ¢/kWh	23.800 ¢/kWh
On-shore Wind	12.0 ¢/kWh	24.80 ¢/kWh	17.700 ¢/kWh
In-line Hydro	11.1 ¢/kWh	7.06 ¢/kWh	-
			BASELINE RATES
Tier 1		13.20 ¢/kWh	21.3 ¢/kWh
Tier 2		7.06 ¢/kWh	18.9 ¢/kWh
Tier 3			12.8¢/kWh

Similar to their proposed Tier 1 and Tier 2 FIT rates, Clean Energy Maui and Zero Emissions did not provide the supporting data and methodology used to determine their proposed Tier 3 FIT rates and proposed baseline rates. There were no discussions with the Parties as to how these rates were determined, nor were they presented to the Parties during the technical sessions. Further, their April 29, 2010 filing included proposed Tier 1 and Tier 2 FIT rates and baseline rates that are significantly different from their proposal filed last January 7, 2010 without offering any basis or reasons for the changes.

DBEDT believes that these two parties' proposed FIT rates are without basis and are not credible for use in establishing Hawaii's FIT rates and should be rejected by the Commission.

DATED: Honolulu, Hawaii, May 20, 2010.

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Certificate of Service

I hereby certify that I have served a copy of the Department of Business, Economic Development, and Tourism's Comments on the Proposed FIT Tier 3 Tariffs in PUC Docket Number 2008-0273, by electronic transmission on the date of signature to each of the parties listed below.

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