



# power tool institute, inc.

1300 SUMNER AVENUE, CLEVELAND, OHIO 44115-2851 216-241-7333 FAX 216-241-0105

E-Mail: [pti@powertoolinstitute.com](mailto:pti@powertoolinstitute.com) URL: [www.powertoolinstitute.com](http://www.powertoolinstitute.com)

November 21, 2011

Via E-mail and First Class Mail

Mr. Harinder Singh  
Mr. Michael Leao  
Dockets Office, MS-4  
California Energy Commission  
1516 Ninth Street  
Sacramento, CA 95814-5512  
[Docket@energy.state.ca.us](mailto:Docket@energy.state.ca.us)

**DOCKET**

**11-AAER-2**

DATE Nov. 21 2011

RECD. Nov. 21 2011

Re: Docket No. 11-AAER-2; 2010 Rulemaking Proceeding Phase II on Appliance Efficiency Regulations

Dear Mr. Singh and Mr. Leao:

On behalf of the Power Tool Institute (PTI), I would like to provide our comments on the California Energy Commission's (CEC) Proposed Amendments to Appliance Efficiency Regulations (October 2011) which propose amendments to Sections 1601 – 1608 of Title 20 of the California Code of Regulations (CCR), the Efficiency Standards for Battery Chargers and Lighting Controls, Staff Analysis of Battery Charger Standards (Staff Report), Docket No. 09-AAER-02; 2010 Rulemaking Proceeding Phase II on Appliance Efficiency Regulations (March 2011).

The Power Tool Institute (PTI) is a trade association of the leading power tool manufacturers in the United States . We have been very active in providing ongoing, responsible advocacy promoting meaningful rulemaking for battery charging systems in California and at the Federal level.

1. **Federal Preemption:** As the CEC is well aware, the US Department of Energy (DOE) is in the concluding phases of issuing a Federal regulation covering the energy efficiency of battery charging systems. This regulation will almost certainly be issued before the California rule becomes effective and is expected to be substantially different in approach than the CEC rule. Aside from whatever differences that CEC has over the DOE approach, it will preempt any California rule upon the effective date of the DOE rule. This strictly limits any supposed public value that the CEC regulation might have to a relatively narrow window between the two effective dates, but not without creating significant disruption to our industry by necessitating the redesign nearly all of our battery charging systems.

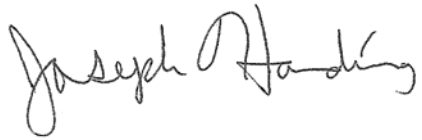
2. **Undue Burden:** As is demonstrated in the CEC Staff Report, Table A-2, power tools are particularly affected by this rule as nearly all battery charger systems investigated by the CEC failed to comply with the proposed limits. This points to several issues:
  - a. The almost universal non-compliance indicates that there are not readily available solutions for achieving compliance.
  - b. Manufacturers would need to redesign nearly all their BCS's. They could not, for example, simply obsolete older, less efficient models. The time and effort to accomplish this is a huge burden on an industry already suffering from sustained, crippling economic conditions. There are simply insufficient resources in most companies to fulfill this redesign effort in the time required.
  - c. While the energy savings opportunity on a per unit basis probably seems attractive, the truth is that power tools comprise a small share of all BCS's in the consumer market space. Making the energy efficiency goals achievable for our products would have little impact on reducing the overall benefit that the Commission anticipates from the regulation.
3. **Impact on nickel chemistry BCS's:** While an increasing number of battery operated power tools offered by manufacturers are powered by lithium-ion batteries, nickel cadmium and nickel metal-hydride based systems are still quite prevalent. Nickel based systems offer the advantages of high-value, safety and robustness that will assure their continuance as an offering for power tool consumers. The CEC has long reassured us that their intention was not to outlaw a particular chemistry, but rather to make the regulation chemistry neutral. This regulation does exactly the opposite. In numerous comments to CEC staff and workshop presentations from PTI membership, AHAM and others; there exists an overwhelming dependence of the cell chemistry of the system to comply with the requirements. This effect is related to the inherent properties of nickel based cells themselves (something power tool manufacturers have no design control over) and not the efficiency of the charger. Industry comment has not been limited to criticism alone; specific recommendations to address this shortcoming by altering the metric to allow for the minimal chemistry-based energy requirements have been provided to Staff and obviously ignored. In addition, we have demonstrated that there is no feasible solution, based upon cell chemistry considerations alone, for medium energy nickel based systems (above about 20 Wh). The CEC has spoken of alternative methods, but failed to demonstrate any instance of these methods in use.
4. **Overstated benefit/cost:** The CEC justifies the necessity and benefit of pursuing this rulemaking upon the claim that consumers will see a net cost benefit owing to the high energy savings offset by a smaller increase in product price at retail. There have been numerous requests by industry for CEC to review their analysis and assumptions with respect to this justification. CEC has not done so. Researchers from Berkley Research Group (BRG), experienced and qualified to perform these analyses, have performed a review and reassessment of the CEC analysis (attached: [A Critique of the Regulations on Battery Charging Systems Proposed by the California Energy Commission](#)) and has found that in nearly all product categories, and for power tools in particular, the benefit to the California consumer is negative. It is unclear why the CEC would burden the residents of California with the additional costs of the products they purchase without delivering a tangible savings to the cost their electricity.

5. **Impact of multiple metrics on consumer benefit:** The PTI has long advocated for the use of a single energy usage metric, based upon usage factors, and reflective of actual consumer energy benefit. The Commission, instead, has been resolute in its insistence upon more than a single metric, each detached from actual usage patterns, while interestingly using usage factors to fulfill their obligation to demonstrate consumer energy savings. This results in the not uncommon possibility that a compliant product may, in fact, consume more energy in use than a non-complaint product. This is because, as the Staff report observes, the proportion of time that power tool charging is very small compared to maintenance and no-battery modes. A charging system that just meets both requirements could easily be more consumptive than one that meets only one. In general, with a mix of lithium-ion and nickel based chargers, we believe that there are a significant proportion of chargers that will demonstrate negative energy savings due to this policy offsetting those products where energy a modest savings is evident. In total, this reduces the net benefit to the consumers and ratepayers of California.
6. **Understated cost of implementation:** By contrast, for nearly every product there will be some cost to implement changes to comply with the regulation. Those costs are amplified through the normal mark-ups and overheads to the consumer as substantial price increase. On average, we believe this to be about \$3.76 price increase at retail but in some cases, such as larger nickel based chargers, the price impact of devising and implementing an as yet unknown technology is difficult to determine, potentially in the \$20 range. The average price increase is in the range predicted by the DOE's preliminary analysis. Taking the reduced benefit due to multiple metrics combined with a high cost of implementation, it is difficult to see, across a range of power tool BCS's, why this regulation is in the consumer's financial best interest.
7. **Fails to meet statutory requirements:** The CEC's enabling legislation, the Warren-Alquist Act, requires appliance efficiency standards to:
  - a. Based upon a reasonable use pattern – not metrics unrelated to usage, as is the case with the CEC regulation
  - b. Provide demonstrated consumer benefit – based upon comments above, clearly that has not been demonstrated with respect to power tool BCS's.
  - c. Technologically feasible – CEC has failed to demonstrate that feasible solutions exist for many nickel based chargers.
  - d. Substantial state-wide energy savings – based upon the short effective term of this regulation and the limited savings from power tools, this is clearly not the case for this product category.

It is PTI's position that the CEC should suspend the furtherance of the consumer products portion of this regulation pending the issuance of the DOE NOPR covering the same range of products. When the NOPR is issued the CEC should convene a stakeholders workshop to determine the extent of additional benefit that might be achieved by a separate CEC regulation during the period prior to the effective date of the Federal regulation. This would translate into only a minimal delay to the CEC for this subcategory while permitting the balance of the regulation to move forward. The Commission and stakeholders would be better informed of the relative merits of a CEC regulation when the federal version becomes available.

PTI appreciates the opportunity to comment on the California Energy Commission's Proposed Amendments to Appliance Efficiency Regulations (October 2011), and would be glad to further discuss these matters with CEC.

Sincerely,

A handwritten signature in black ink that reads "Joseph Harding". The signature is fluid and cursive, with the first name "Joseph" and last name "Harding" clearly distinguishable.

Joseph Harding  
Technical Director  
Power Tool Institute  
1300 Sumner Avenue  
Cleveland, Ohio 44115-2851 USA  
Tel: 216-241-7333 x3008  
Fax: 216-241-0105  
[jharding@thomasamc.com](mailto:jharding@thomasamc.com)  
[www.powertoolinstitute.com](http://www.powertoolinstitute.com)

JH/jlb  
pti  
Attachment

**A Critique of the Regulations on Battery Charging Systems**  
**Proposed by the California Energy Commission**

C. Paul Wazzan, Ph.D.\*

Dawn Eash, M.S.

**Abstract**

The California Energy Commission (“CEC”) seeks to amend its Appliance Efficiency Regulations to adopt efficiency standards, certification and marking requirements for large and small battery charger systems. The CEC has put forth a model for estimating the energy savings attributable to these proposed regulations. We have reviewed this model and found fault in the calculations as well as the methodology proposed. As such, we have corrected these errors and have additionally created a new model to reflect a more realistic picture of the effects of the proposed regulations on energy savings realized by California consumers. The corrected CEC approach and our new model both show that a majority of battery charger product categories have a consumer net negative impact as a result of the proposed regulations.

November 18, 2011

\* This report was commissioned by the Association of Home Appliance Manufacturers, the Consumer Electronics Association, CTIA – The Wireless Association, and TechAmerica. The authors are with Berkeley Research Group in Los Angeles, CA. Corresponding author is Wazzan who can be reached at 310-499-4919 or pwazzan@brg-expert.com.

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## **I. INTRODUCTION**

The CEC filed its Staff Report containing its staff analysis of battery chargers and self-contained lighting controls in October 2011. This analysis was largely dependent on the CASE report prepared by Ecos Consulting last modified October 1, 2010. According to the Staff Report, the CEC's proposed regulations, once fully implemented, will save California ratepayers approximately \$306 million per year.<sup>1</sup> The calculations required to estimate these savings are contained in the Appendices to the Staff Report (specifically A-7). While the CEC purports to calculate cumulative savings "up to the point where compliant products begin replacing noncompliant products", their model calculations actually estimate first year savings attributable to the regulation after a complete turnover of the current stock.<sup>2</sup> We find this simplistic approach to be fundamentally flawed and logically unsound as it fails to account for: 1) turnover (i.e., it takes new sales to turn over the existing stock – one could assume that design life equates to total stock turnover); 2) the time value of money; 3) the potential impact of pending U.S. Department of Energy ("DOE") regulations; 4) the incremental cost of compliance; and 5) technological improvements due to competition.

Moreover, the CEC calculations contain arithmetic errors and are based on outdated data which overstate product savings and understate the incremental costs of compliance.

This paper is organized as follows. First, we replicate the CEC model (see Exhibit 1) and then apply a series of corrections including math and logic. Second, we develop an economic model which more accurately reflects the expected first year costs and savings from the proposed regulations and which incorporates the shortcomings of the CEC approach as discussed above.

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<sup>1</sup> See "Energy Efficiency Standards for Battery Chargers: Frequently Asked Questions"

<sup>2</sup> See CEC Staff Report. Amendment to Appliance Efficiency Regulations. Docket # 11-AAER-2.  
<http://www.energy.ca.gov/2011publications/CEC-400-2011-009/CEC-400-2011-009.pdf>

It is important to note that our analysis in Exhibit 3 simply corrects for math errors made by the CEC and incorporates the costs of compliance. As such, if the CEC believes that their model is correct, then the CEC cannot dispute the results contained in Exhibit 3.

## **II. CORRECTING FOR CALCULATION ERRORS**

We were unable to replicate the results contained in A-7 of the Staff Report. Using the model provided to us by the CEC and using the data figures contained in the Staff Report, we generate Exhibit 2 which shows corrected first-year savings.

## **III. ACCOUNTING FOR THE COST OF COMPLIANCE**

The CEC analysis provides estimates for the cost of complying with the proposed regulations. Unfortunately the CEC estimate of annual savings never incorporates these costs. The CEC effectively ignores its own estimated costs. Exhibit 3 incorporates these incremental costs. It should be noted that the estimates given in Exhibit 3 are wholly predicated on CEC's data, model and assumptions.

It is important to note that the Staff Report presents its findings as a summary of savings from all the affected products. Exhibit 3 clearly indicates that even under the CEC methodology, certain product categories will fail to be consumer net neutral (e.g., Emergency Systems, Personal Care, and Portable Electronics).



#### **IV. INCORPORATING DOE REGULATIONS**

We assume that the DOE regulations take effect in 2014 and are identical to the CEC regulations which take effect one year prior in 2013. Consequently, any savings occurring in and beyond 2014 are attributable to the DOE regulations and are not included as part of the CEC savings. Exhibit 4 presents this analysis.

#### **V. INCORPORATING TECHNOLOGICAL INNOVATION DUE TO COMPETITION**

We assume that compliance rates (with the proposed CEC regulation) will linearly increase by 10% annually (e.g., a product assumed to have 0% compliance in 2009 will have 40% compliance by 2013 due to natural competition and will continue to increase 10% annually). In assuming a 10% year by year technological improvement, we rely on information collected informally from industry sources and Energy Star historical compliance increases.<sup>3</sup> Note that the dispersion of the answers provided by industry at this time was significant. Our analysis is presented in Exhibit 5. Note that additional product categories have become consumer net negative (e.g., Handheld Barcode Scanners, Two-Way Radios and Three Phase Lift-Trucks).

#### **VI. INCORPORATING MANUFACTURER INPUT ON COSTS OF COMPLIANCE**

Starting with Exhibit 5 as our current base, we now incorporate current cost and/or energy savings provided directly from industry. Our analysis is presented in Exhibit 6.

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<sup>3</sup> Battery charger compliance with Energy Star has increased from 15% in 2008, 27% in 2009 to an estimated 34% in 2010. See [http://www.energystar.gov/index.cfm?c=partners.unit\\_shipment\\_data\\_archives](http://www.energystar.gov/index.cfm?c=partners.unit_shipment_data_archives).

At this point, it is readily apparent that most products are consumer net negative as a result of the proposed regulations using CEC's approach/model (e.g., Power tools and Laptops).

## **VII. BRG APPROACH TO ESTIMATING POTENTIAL SAVINGS FROM PROPOSED CEC REGULATIONS**

As discussed above, we believe the CEC model is fundamentally flawed. We propose a substitute model which more accurately reflects economic realities (e.g., turnover, design life, time value of money). We estimate a schedule of each product's conversion to compliance over time due to natural innovation in battery charging technology and compare the savings that could be yielded by regulating 100% compliance beginning in 2013. Our assumptions are as follows: 1) annual product turnover equals 1 divided by the design life (e.g., if a product has a design life of 10 years then 10% of the current stock will turnover each year); 2) cost and savings are equal to those reported in the CASE and Staff Reports, except where industry manufacturers have provided revised estimates<sup>4</sup>; and, 3) if the regulations are not enacted then the incremental cost of compliance is assumed to be zero since compliance would occur as part of the natural R&D process.

The "first year savings" using this more realistic approach eliminates savings over most product categories and leaves positive savings possible only for: 1) Auto/Marine/RV; 2) Personal Electric Vehicles; and 3) Portable Lighting. Our summary results are presented in Exhibit 7. Supporting product schedules are attached thereto.

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<sup>4</sup> Specifically, these revised estimates are for products in the cordless phone, laptop and power tool product categories and the estimates are shown in the support for Exhibit 7.

As a final point it is interesting to note that under both the CEC's flawed model as well as our more realistic approach a majority of products become consumer net negative as a result of the proposed regulations.

**Exhibit 1**  
**Savings From Table A-7 in the CEC's Staff Report**

Product Category	Compliance	Discounted Design Life (Years)	Unit Incremental Cost Increase (\$)	Unit Energy Savings (Kwh/yr)	Unit Cost Savings (\$)	Net Unit Savings (\$)	Stock Energy Savings (Gwh/yr)	Stock Energy Savings (\$M)	Energy Savings of First Year Sales (Gwh)	Benefit / Cost
Auto/Marine/RV	0%	8.75	\$ 10.00	313.9	\$ 384.65	\$ 374.65	656.1	\$ 91.85	63.6	38.5
Cell Phones	90%	1.97	\$ -	0.5	\$ 0.12	\$ 0.12	2.7	\$ 0.37	1.9	0.0
Cordless Phones	0%	4.71	\$ 0.40	13.4	\$ 8.84	\$ 8.44	178.3	\$ 24.96	28.9	22.1
Personal Audio Electronics	90%	2.91	\$ -	0.5	\$ 0.20	\$ 0.20	1.6	\$ 0.22	0.7	0.0
Emergency Systems	10%	6.40	\$ 3.00	15.9	\$ 14.22	\$ 11.22	77.1	\$ 10.80	18.6	4.7
Laptops	10%	3.82	\$ 0.50	16.8	\$ 9.00	\$ 8.50	369.4	\$ 51.71	144.4	18.0
Personal Care	0%	4.71	\$ 0.40	1.8	\$ 1.19	\$ 0.79	17.5	\$ 2.46	3.8	3.0
Personal Electric Vehicles	10%	8.75	\$ 12.00	536.8	\$ 657.81	\$ 645.81	106.3	\$ 14.88	41.4	54.8
Portable Electronics	10%	4.71	\$ 0.40	1.7	\$ 1.13	\$ 0.73	28.2	\$ 3.95	5.1	2.8
Portable Lighting	0%	8.75	\$ 0.40	8.6	\$ 10.56	\$ 10.16	10.3	\$ 1.45	1.0	26.4
Power Tools	10%	5.57	\$ 0.55	15.0	\$ 11.65	\$ 11.10	250.3	\$ 35.04	46.9	21.2
Universal Battery Charger	50%	7.21	\$ 0.40	3.9	\$ 3.96	\$ 3.56	2.0	\$ 0.27	0.2	9.9
Golf Cart / Electric Carts	50%	8.75	\$ 200.00	807.6	\$ 989.61	\$ 789.61	100.1	\$ 14.02	13.4	4.9
Emergency Backup Lighting	50%	8.75	\$ 3.00	8.6	\$ 10.48	\$ 7.48	33.6	\$ 4.70	8.6	3.5
Handheld Barcode Scanners	50%	7.21	\$ 0.50	19.7	\$ 19.86	\$ 19.36	3.2	\$ 0.44	0.3	39.7
Two-Way Radios	50%	7.21	\$ 0.50	8.9	\$ 8.94	\$ 8.44	2.7	\$ 0.37	0.3	17.9
Single Phase Lift-Trucks	0%	12.22	\$ 200.00	1,032.5	\$ 1,767.36	\$ 1,567.36	30.8	\$ 4.31	2.4	8.8
Three Phase Lift-Trucks	0%	12.22	\$ 400.00	4,198.5	\$ 7,185.73	\$ 6,785.73	316.6	\$ 44.32	24.5	18.0
<b>Totals</b>							<b>2,186.6</b>	<b>\$ 306.12</b>		

**Exhibit 2**  
**Savings From Table A-7 in the CEC's Staff Report When Calculations Are Corrected**

Product Category	2009 Stock (millions)	2010 Sales (millions)	Compliance	Discounted Design Life (Years)	Unit Incremental Cost Increase (\$)	Unit Energy Savings (Kwh/yr)	Unit Cost Savings (\$)	Net Unit Savings (\$)	Stock Energy Savings (Gwh/yr)	Stock Energy Savings (\$M)	Energy Savings of First Year Sales (Gwh)	Benefit / Cost
Source	CEC	CEC	CEC	CEC	CEC	CEC	CEC	CEC	1	2	3	CEC
Calculation	a	b	c	d	e	f	g = f * d * \$0.14	h = g - e	i = a * f * (1 - c)	j = i * \$0.14	k = b * f * (1 - c)	l = g / e
Auto/Marine/RV	1.80	0.19	0%	8.75	\$ 10.00	313.9	\$ 384.64	\$ 374.64	565.0	\$ 79.10	58.2	38.5
Cell Phones	47.90	33.64	90%	1.97	\$ -	0.5	\$ 0.12	\$ 0.12	2.2	\$ 0.30	1.5	N/A
Cordless Phones	20.50	2.89	0%	4.71	\$ 0.40	13.4	\$ 8.83	\$ 8.43	274.7	\$ 38.46	38.7	22.1
Personal Audio Electronics	29.80	11.78	90%	2.91	\$ -	0.5	\$ 0.20	\$ 0.20	1.5	\$ 0.20	0.6	N/A
Emergency Systems	5.30	1.30	10%	6.40	\$ 3.00	15.9	\$ 14.22	\$ 11.22	75.7	\$ 10.60	18.6	4.7
Laptops	16.00	5.90	10%	3.82	\$ 0.50	16.8	\$ 9.00	\$ 8.50	242.2	\$ 33.91	89.2	18.0
Personal Care	8.70	1.91	0%	4.71	\$ 0.40	1.8	\$ 1.19	\$ 0.79	15.7	\$ 2.20	3.5	3.0
Personal Electric Vehicles	0.10	0.05	10%	8.75	\$ 12.00	536.8	\$ 657.82	\$ 645.82	48.3	\$ 6.76	22.8	54.8
Portable Electronics	10.30	2.18	10%	4.71	\$ 0.40	1.7	\$ 1.13	\$ 0.73	15.9	\$ 2.22	3.4	2.8
Portable Lighting	1.20	0.01	0%	8.75	\$ 0.40	8.6	\$ 10.56	\$ 10.16	10.3	\$ 1.45	0.1	26.4
Power Tools	15.30	3.01	10%	5.57	\$ 0.55	15.0	\$ 11.65	\$ 11.10	205.9	\$ 28.82	40.5	21.2
Universal Battery Charger	0.90	0.11	50%	7.21	\$ 0.40	3.9	\$ 3.97	\$ 3.57	1.8	\$ 0.25	0.2	9.9
Golf Cart / Electric Carts	0.18	0.02	50%	8.75	\$ 200.00	807.6	\$ 989.62	\$ 789.62	70.7	\$ 9.89	8.0	4.9
Emergency Backup Lighting	7.90	2.00	50%	8.75	\$ 3.00	8.6	\$ 10.48	\$ 7.48	33.8	\$ 4.73	8.6	3.5
Handheld Barcode Scanners	0.26	0.02	50%	7.21	\$ 0.50	19.7	\$ 19.85	\$ 19.35	2.6	\$ 0.36	0.2	39.7
Two-Way Radios	0.60	0.03	50%	7.21	\$ 0.50	8.9	\$ 8.94	\$ 8.44	2.7	\$ 0.37	0.1	17.9
Single Phase Lift-Trucks	0.03	0.00	0%	12.22	\$ 200.00	1,032.5	\$ 1,767.07	\$ 1,567.07	29.9	\$ 4.19	2.2	8.8
Three Phase Lift-Trucks	0.07	0.01	0%	12.22	\$ 400.00	4,198.5	\$ 7,185.68	\$ 6,785.68	310.7	\$ 43.50	22.5	18.0
<b>Totals</b>									<b>1,909.4</b>	<b>\$ 267.32</b>		

**Notes and Sources:**

- 1 This figure is incorrectly calculated in the CEC Staff report and is recalculated using the formula provided in the CEC's Staff Report:  $B_{stock} = B_{energy\_savings} \times N_{2009\_stock} \times (1 - R_{compliance})$ .
- 2 This figure is multiplied by the cost of energy per kilowatt to calculate the dollar value of the energy savings.
- 3 This figure is incorrectly calculated in the CEC Staff report and is recalculated using the formula provided in the CEC's Staff Report:  $B_{stock} = B_{energy\_savings} \times N_{2010\_sales} \times (1 - R_{compliance})$ .

**Exhibit 3**  
**Net Savings From Table A-7 in the CEC's Staff Report When Calculations Are Corrected**

Product Category	2009 Stock (millions)	Compliance	Discounted Design Life (Years)	Unit Incremental Cost Increase (\$)	Unit Energy Savings (Kwh/yr)	Stock Energy Savings (Gwh/yr)	Stock Energy Savings (\$M)	Incremental Costs (\$M)	Net Savings (\$M)	Benefit / Cost Ratio
Source	CEC	CEC	CEC	CEC	CEC	1	2	3	4	5
Calculation	a	b	c	d	e	f	g	h	i	j
						= a * e * (1 - b)	= f * \$0.14	= a * d	= g - h	= g / h
Auto/Marine/RV	1.80	0%	8.75	\$ 10.00	313.9	565.0	\$ 79.10	\$ 18.00	\$ 61.10	4.39
Cell Phones	47.90	90%	1.97	\$ -	0.5	2.2	\$ 0.30	\$ -	\$ 0.30	N/A
Cordless Phones	20.50	0%	4.71	\$ 0.40	13.4	274.7	\$ 38.46	\$ 8.20	\$ 30.26	4.69
Personal Audio Electronics	29.80	90%	2.91	\$ -	0.5	1.5	\$ 0.20	\$ -	\$ 0.20	N/A
Emergency Systems	5.30	10%	6.40	\$ 3.00	15.9	75.7	\$ 10.60	\$ 15.90	\$ (5.30)	0.67
Laptops	16.00	10%	3.82	\$ 0.50	16.8	242.2	\$ 33.91	\$ 8.00	\$ 25.91	4.24
Personal Care	8.70	0%	4.71	\$ 0.40	1.8	15.7	\$ 2.20	\$ 3.48	\$ (1.28)	0.63
Personal Electric Vehicles	0.10	10%	8.75	\$ 12.00	536.8	48.3	\$ 6.76	\$ 1.20	\$ 5.56	5.64
Portable Electronics	10.30	10%	4.71	\$ 0.40	1.7	15.9	\$ 2.22	\$ 4.12	\$ (1.90)	0.54
Portable Lighting	1.20	0%	8.75	\$ 0.40	8.6	10.3	\$ 1.45	\$ 0.48	\$ 0.97	3.02
Power Tools	15.30	10%	5.57	\$ 0.55	15.0	205.9	\$ 28.82	\$ 8.42	\$ 20.41	3.42
Universal Battery Charger	0.90	50%	7.21	\$ 0.40	3.9	1.8	\$ 0.25	\$ 0.36	\$ (0.11)	0.69
Golf Cart / Electric Carts	0.18	50%	8.75	\$ 200.00	807.6	70.7	\$ 9.89	\$ 35.00	\$ (25.11)	0.28
Emergency Backup Lighting	7.90	50%	8.75	\$ 3.00	8.6	33.8	\$ 4.73	\$ 23.70	\$ (18.97)	0.20
Handheld Barcode Scanners	0.26	50%	7.21	\$ 0.50	19.7	2.6	\$ 0.36	\$ 0.13	\$ 0.23	2.75
Two-Way Radios	0.60	50%	7.21	\$ 0.50	8.9	2.7	\$ 0.37	\$ 0.30	\$ 0.07	1.24
Single Phase Lift-Trucks	0.03	0%	12.22	\$ 200.00	1,032.5	29.9	\$ 4.19	\$ 5.80	\$ (1.61)	0.72
Three Phase Lift-Trucks	0.07	0%	12.22	\$ 400.00	4,198.5	310.7	\$ 43.50	\$ 29.60	\$ 13.90	1.47
<b>Totals</b>						<b>1,909.4</b>	<b>\$ 267.32</b>	<b>\$ 162.69</b>	<b>\$ 104.63</b>	

**Notes and Sources:**

- 1 This figure is incorrectly calculated in the CEC Staff report and is recalculated using the formula provided in the CEC's Staff Report:  

$$B_{\text{stock}} = B_{\text{energy\_savings}} \times N_{2009\_\text{stock}} \times (1 - R_{\text{compliance}}).$$
- 2 This figure is multiplied by the cost of energy per kilowatt to calculate the dollar value of the energy savings.
- 3 This figure is incorrectly calculated in the CEC Staff report and is recalculated using the formula provided in the CEC's Staff Report:  

$$B_{\text{stock}} = B_{\text{energy\_savings}} \times N_{2010\_sales} \times (1 - R_{\text{compliance}}).$$
- 4 Net savings are the dollar energy savings less the incremental costs.
- 5 Benefit / cost ratio is the ratio of energy savings to incremental costs. A ratio of less than 1 indicates that savings are less than total costs.

**Exhibit 4**  
**Energy Savings Prior to Implementation of DOE Regulations in 2014**

Product Category	2013 Sales (millions)	Compliance 2009	Discounted Design Life (Years)	Unit Incremental Cost Increase (\$)	Unit Energy Savings (Kwh/yr)	Energy Savings Prior to DOE Regulations (Gwh)	Dollar Savings Prior to DOE Regulations (\$M)	Incremental Costs (\$M)	Net Savings (\$M)	Benefit / Cost Ratio
Source	CEC	CEC	CEC	CEC	CEC	1	2	3	4	5
Calculation	a	b	c	d	e	f	g	h	i	j
						= a * e * (1 - b)	= f * \$0.14	= d * a	= g - h	= g / h
Auto/Marine/RV	0.20	0%	8.75	\$ 10.00	313.9	63.6	\$ 8.90	\$ 2.03	\$ 6.88	4.39
Cell Phones	41.65	90%	1.97	\$ -	0.5	1.9	\$ 0.26	\$ -	\$ 0.26	N/A
Cordless Phones	2.15	0%	4.71	\$ 0.40	13.4	28.9	\$ 4.04	\$ 0.86	\$ 3.18	4.69
Personal Audio Electronics	13.73	90%	2.91	\$ -	0.5	0.7	\$ 0.09	\$ -	\$ 0.09	N/A
Emergency Systems	1.30	10%	6.40	\$ 3.00	15.9	18.6	\$ 2.60	\$ 3.90	\$ (1.30)	0.67
Laptops	9.54	10%	3.82	\$ 0.50	16.8	144.4	\$ 20.22	\$ 4.77	\$ 15.45	4.24
Personal Care	2.11	0%	4.71	\$ 0.40	1.8	3.8	\$ 0.54	\$ 0.84	\$ (0.31)	0.63
Personal Electric Vehicles	0.09	10%	8.75	\$ 12.00	536.8	41.4	\$ 5.79	\$ 1.03	\$ 4.77	5.64
Portable Electronics	3.31	10%	4.71	\$ 0.40	1.7	5.1	\$ 0.71	\$ 1.32	\$ (0.61)	0.54
Portable Lighting	0.01	0%	8.75	\$ 0.40	8.6	0.1	\$ 0.01	\$ 0.00	\$ 0.01	3.02
Power Tools	3.49	10%	5.57	\$ 0.55	15.0	46.9	\$ 6.57	\$ 1.92	\$ 4.65	3.42
Universal Battery Charger	0.12	50%	7.21	\$ 0.40	3.9	0.2	\$ 0.03	\$ 0.05	\$ (0.02)	0.69
Golf Cart / Electric Carts	0.03	50%	8.75	\$ 200.00	807.6	11.4	\$ 1.59	\$ 5.64	\$ (4.04)	0.28
Emergency Backup Lighting	2.00	50%	8.75	\$ 3.00	8.6	8.6	\$ 1.20	\$ 6.00	\$ (4.80)	0.20
Handheld Barcode Scanners	0.03	50%	7.21	\$ 0.50	19.7	0.3	\$ 0.04	\$ 0.01	\$ 0.02	2.75
Two-Way Radios	0.03	50%	7.21	\$ 0.50	8.9	0.1	\$ 0.02	\$ 0.01	\$ 0.00	1.24
Single Phase Lift-Trucks	0.00	0%	12.22	\$ 200.00	1,032.5	2.4	\$ 0.34	\$ 0.47	\$ (0.13)	0.72
Three Phase Lift-Trucks	0.01	0%	12.22	\$ 400.00	4,198.5	24.5	\$ 3.43	\$ 2.34	\$ 1.10	1.47
<b>Totals</b>						<b>402.8</b>	<b>\$ 56.39</b>	<b>\$ 31.19</b>	<b>\$ 25.20</b>	

**Notes and Sources:**

- 1 Energy savings assuming DOE regulations go into effect in 2014 and only 2013 energy savings can be attributed to CEC regulations.
- 2 This figure is multiplied by the cost of energy per kilowatt to calculate the dollar value of the energy savings.
- 3 Net costs are per unit incremental costs multiplied by the first year sales.
- 4 Net savings are the dollar energy savings less the incremental costs.
- 5 Benefit / cost ratio is the ratio of energy savings to incremental costs. A ratio of less than 1 indicates that savings are less than total costs.

**Exhibit 5**  
**Energy Savings Prior to Implementation of DOE Regulations and Increased Compliance Rates Due to Technological Innovation**

Product Category	2013 Sales (millions)	Compliance 2009	Discounted Design Life (Years)	Unit Incremental Cost Increase (\$)	Unit Energy Savings (Kwh/yr)	Compliance 2013	Energy Savings Prior to DOE Regulations With Increased Compliance (Gwh)	Dollar Savings Prior to DOE Regulations With Increased Compliance (\$M)	Incremental Costs (\$M)	Net Savings (\$M)	Benefit / Cost Ratio
Source	CEC	CEC	CEC	CEC	CEC	1	2	3	4	5	6
Calculation	a	b	c	d	e	f	g	h	i	j	k
							= a * e * (1 - f)	= g * \$0.14	= d * a	= h - i	= h / i
Auto/Marine/RV	0.20	0%	8.75	\$ 10.00	313.9	40%	38.2	\$ 5.34	\$ 2.03	\$ 3.32	2.64
Cell Phones	41.65	90%	1.97	\$ -	0.5	100%	0.0	\$ -	\$ -	\$ -	N/A
Cordless Phones	2.15	0%	4.71	\$ 0.40	13.4	40%	17.3	\$ 2.42	\$ 0.86	\$ 1.56	2.81
Personal Audio Electronics	13.73	90%	2.91	\$ -	0.5	100%	0.0	\$ -	\$ -	\$ -	N/A
Emergency Systems	1.30	10%	6.40	\$ 3.00	15.9	50%	10.3	\$ 1.44	\$ 3.90	\$ (2.46)	0.37
Laptops	9.54	10%	3.82	\$ 0.50	16.8	50%	80.2	\$ 11.23	\$ 4.77	\$ 6.46	2.35
Personal Care	2.11	0%	4.71	\$ 0.40	1.8	40%	2.3	\$ 0.32	\$ 0.84	\$ (0.52)	0.38
Personal Electric Vehicles	0.09	10%	8.75	\$ 12.00	536.8	50%	23.0	\$ 3.22	\$ 1.03	\$ 2.19	3.13
Portable Electronics	3.31	10%	4.71	\$ 0.40	1.7	50%	2.8	\$ 0.40	\$ 1.32	\$ (0.93)	0.30
Portable Lighting	0.01	0%	8.75	\$ 0.40	8.6	40%	0.1	\$ 0.01	\$ 0.00	\$ 0.00	1.81
Power Tools	3.49	10%	5.57	\$ 0.55	15.0	50%	26.1	\$ 3.65	\$ 1.92	\$ 1.73	1.90
Universal Battery Charger	0.12	50%	7.21	\$ 0.40	3.9	90%	0.0	\$ 0.01	\$ 0.05	\$ (0.04)	0.14
Golf Cart / Electric Carts	0.03	50%	8.75	\$ 200.00	807.6	90%	2.3	\$ 0.32	\$ 5.64	\$ (5.32)	0.06
Emergency Backup Lighting	2.00	50%	8.75	\$ 3.00	8.6	90%	1.7	\$ 0.24	\$ 6.00	\$ (5.76)	0.04
Handheld Barcode Scanners	0.03	50%	7.21	\$ 0.50	19.7	90%	0.1	\$ 0.01	\$ 0.01	\$ (0.01)	0.55
Two-Way Radios	0.03	50%	7.21	\$ 0.50	8.9	90%	0.0	\$ 0.00	\$ 0.01	\$ (0.01)	0.25
Single Phase Lift-Trucks	0.00	0%	12.22	\$ 200.00	1,032.5	40%	1.4	\$ 0.20	\$ 0.47	\$ (0.26)	0.43
Three Phase Lift-Trucks	0.01	0%	12.22	\$ 400.00	4,198.5	40%	14.7	\$ 2.06	\$ 2.34	\$ (0.28)	0.88
<b>Totals</b>							<b>220.5</b>	<b>\$ 30.87</b>	<b>\$ 31.19</b>	<b>\$ (0.32)</b>	

**Notes and Sources:**

- Compliance increases by 10% annually due to natural technological innovation each year from year 2009 to 2013. This estimate is based on historical Energy Star data. Battery charger compliance with Energy Star has increased from 15% in 2008, 27% in 2009 and an estimated 24% in 2010. See [http://www.energystar.gov/index.cfm?c=partners.unit\\_shipment\\_data\\_archives](http://www.energystar.gov/index.cfm?c=partners.unit_shipment_data_archives).
- Energy savings assuming DOE regulations go into effect in 2014 and only 2013 energy savings can be attributed to CEC regulations. This figure also includes the increased compliance figures due to technological innovations.
- This figure is multiplied by the cost of energy per kilowatt to calculate the dollar value of the energy savings.
- This figure is the unit incremental cost increase multiplied by the sales.
- Net savings are the dollar energy savings less the incremental costs.
- Benefit / cost ratio is the ratio of energy savings to incremental costs. A ratio of less than 1 indicates that savings are less than total costs.



**Exhibit 6**  
**Energy Savings Prior to Implementation of DOE Regulations, Increased Compliance Rates Due to Technological Innovation, and Modified Costs and Energy Savings Based on Industry Input**

Product Category	2013 Sales (millions)	Compliance 2009	Discounted Design Life (Years)	Unit Incremental Cost Increase (\$)	Unit Energy Savings (Kwh/yr)	Compliance 2013	Energy Savings Prior to DOE Regulations With Increased Compliance (Gwh)	Dollar Savings Prior to DOE Regulations With Increased Compliance (\$M)	Incremental Costs (\$M)	Net Savings (\$M)	Benefit / Cost Ratio
Source	CEC	CEC	CEC	CEC/Industry	CEC/Industry	1	2	3	4	5	6
Calculation	a	b	c	d	e	f	g = a * e * (1 - f)	h = g * \$0.14	i = d * a	j = h - i	k = h / i
Auto/Marine/RV	0.20	0%	8.75	\$ 10.00	313.9	40%	38.2	\$ 5.34	\$ 2.03	\$ 3.32	2.64
Cell Phones	41.65	90%	1.97	\$ -	0.5	100%	0.0	\$ -	\$ -	\$ -	N/A
<sup>7</sup> Cordless Phones	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	\$ -	N/A
Personal Audio Electronics	13.73	90%	2.91	\$ -	0.5	100%	0.0	\$ -	\$ -	\$ -	N/A
Emergency Systems	1.30	10%	6.40	\$ 3.00	15.9	50%	10.3	\$ 1.44	\$ 3.90	\$ (2.46)	0.37
<sup>8</sup> Laptops	9.54	10%	3.82	\$ 0.03	0.0	50%	0.0	\$ -	\$ 0.29	\$ (0.29)	0.00
Personal Care	2.11	0%	4.71	\$ 0.40	1.8	40%	2.3	\$ 0.32	\$ 0.84	\$ (0.52)	0.38
Personal Electric Vehicles	0.09	10%	8.75	\$ 12.00	536.8	50%	23.0	\$ 3.22	\$ 1.03	\$ 2.19	3.13
Portable Electronics	3.31	10%	4.71	\$ 0.40	1.7	50%	2.8	\$ 0.40	\$ 1.32	\$ (0.93)	0.30
Portable Lighting	0.01	0%	8.75	\$ 0.40	8.6	40%	0.1	\$ 0.01	\$ 0.00	\$ 0.00	1.81
<sup>9</sup> Power Tools	3.49	10%	5.57	\$ 3.76	11.3	50%	19.7	\$ 2.76	\$ 13.12	\$ (10.35)	0.21
Universal Battery Charger	0.12	50%	7.21	\$ 0.40	3.9	90%	0.0	\$ 0.01	\$ 0.05	\$ (0.04)	0.14
Golf Cart / Electric Carts	0.03	50%	8.75	\$ 200.00	807.6	90%	2.3	\$ 0.32	\$ 5.64	\$ (5.32)	0.06
Emergency Backup Lighting	2.00	50%	8.75	\$ 3.00	8.6	90%	1.7	\$ 0.24	\$ 6.00	\$ (5.76)	0.04
Handheld Barcode Scanners	0.03	50%	7.21	\$ 0.50	19.7	90%	0.1	\$ 0.01	\$ 0.01	\$ (0.01)	0.55
Two-Way Radios	0.03	50%	7.21	\$ 0.50	8.9	90%	0.0	\$ 0.00	\$ 0.01	\$ (0.01)	0.25
Single Phase Lift-Trucks	0.00	0%	12.22	\$ 200.00	1,032.5	40%	1.4	\$ 0.20	\$ 0.47	\$ (0.26)	0.43
Three Phase Lift-Trucks	0.01	0%	12.22	\$ 400.00	4,198.5	40%	14.7	\$ 2.06	\$ 2.34	\$ (0.28)	0.88
<b>Totals</b>							<b>116.6</b>	<b>\$ 16.33</b>	<b>\$ 37.04</b>	<b>\$ (20.71)</b>	

**Notes and Sources:**

- Compliance increases by 10% annually due to natural technological innovation each year from year 2009 to 2013. This estimate is based on historical Energy Star data. Battery charger compliance with Energy Star has increased from 15% in 2008, 27% in 2009 and an estimated 24% in 2010. See [http://www.energystar.gov/index.cfm?c=partners.unit\\_shipment\\_data\\_archives](http://www.energystar.gov/index.cfm?c=partners.unit_shipment_data_archives).
- Energy savings assuming DOE regulations go into effect in 2014 and only 2013 energy savings can be attributed to CEC regulations. This figure also includes the increased compliance figures due to technological innovations.
- This figure is multiplied by the cost of energy per kilowatt to calculate the dollar value of the energy savings.
- This figure is the unit incremental cost increase multiplied by the sales.
- Net savings are the dollar energy savings less the incremental costs.
- Benefit / cost ratio is the ratio of energy savings to incremental costs. A ratio of less than 1 indicates that savings are less than total costs.
- Based on industry input, attributing power consumption to battery functions versus other telephony functions is impossible given the nature of cordless phone design. As such, this product category should be excluded as it would require radical product design or could facilitate a manufacturer's complete exit from the California market.
- Based on industry input, the vast majority of laptops already meet the CEC's proposed standards, thus the energy savings earned with the proposed regulations will be negligible. While most believe there will be no cost to comply with the regulations, manufacturers will incur a cost to prove compliance and for mandatory marking.
- Based on industry input regarding the retail impact to consumers and the internal testing of compliant regulations.

**Exhibit 7**  
**Net Energy Savings Attributable to CEC Regulations Over the**  
**Design Life and Prior to DOE Regulations**

Market Segment	Product Category	Net Savings Over Design Life (\$M) <sup>1</sup>	First Year Net Savings (\$M) <sup>2</sup>
<b>Small Consumer</b>	Auto/Marine/RV	\$ 0.01	\$ 3.32
	Cell Phones	\$ -	\$ -
	Cordless Phones <sup>3</sup>	\$ -	\$ -
	Personal Audio Electronics	\$ -	\$ -
	Emergency Systems	\$ (12.02)	\$ (1.41)
	Laptops	\$ (0.68)	\$ (0.18)
	Personal Care	\$ (2.63)	\$ (0.47)
	Personal Electric Vehicles	\$ 0.13	\$ 0.56
	Portable Electronics	\$ (5.57)	\$ (0.97)
	Portable Lighting	\$ (0.13)	\$ 0.04
	Power Tools	\$ (56.37)	\$ (8.24)
	Universal Battery Charger	\$ (0.34)	\$ (0.04)
	Golf Cart / Electric Carts	\$ (42.04)	\$ (4.54)
<b>Small Non-Consumer</b>	Emergency Backup Lighting	\$ (20.00)	\$ (2.20)
	Handheld Barcode Scanners	\$ (0.13)	\$ (0.01)
	Two-Way Radios	\$ (0.25)	\$ (0.03)
<b>Large Non-Consumer</b>	Single Phase Lift-Trucks	\$ (4.19)	\$ (0.22)
	Three Phase Lift-Trucks	\$ (18.26)	\$ (0.23)

**Notes and Sources:**

- 1 These figures include savings over the entire design life of the product category beginning in 2013. This model assumes that beginning in 2013, all sales will be compliant and that sales are just the uniform turnover of the 2013 stock on a yearly basis over the design life of each of the product groups. These savings and costs estimates are then discounted to get the present value of the net savings in 2012.
- 2 This figure includes only the first year savings from the CEC regulations prior to the implementation of the DOE regulations, the increased compliance rates due to technological innovation, and also includes revised costs and energy savings estimates based on input from industry. This model assumes increased compliance from 2009 estimates of 10% per year (i.e. from 10% in 2013 to 20% in 2014, etc.). These savings and costs estimates are then discounted to get the present value of the net savings in 2012.
- 3 Based on input from industry, the regulations surrounding cordless phones are incompatible with current cordless phone design. The only recourse for manufacturers would be to completely redesign the product architecture or to exit the California market completely. As such, meeting the CEC's proposed regulations is currently treated as 'technologically infeasible.'

## Auto / Marine / RV

Market Segment	Product	Design Life (Years)	Compliance	Unit Cost of Regulation (\$)	Unit Energy Savings (Kwh/yr)	First Year Unit Energy Savings (\$)	Stock 2009 (million)	Sales 2009 (million)	CAGR Sales 2010	CAGR Sales 2013	Sales 2010 (million)	Sales 2013 (million)	Stock 2013 (million)
Small Charger	Auto/Marine/RV	10.0	0%	\$10.00	313.90	\$43.95	1.8	0.18	3%	3%	0.19	0.2	2.09

\*These figures come from the CEC Report. See Appendices A-1 - A-7

Discount Rate	3%
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Net Savings Assuming Regulation												Net Savings Assuming No Regulation																	
Year	Unit Energy Savings (Kwh/yr)	Stock Beginning of Year - 2013 (million)	Turnover	Compliance of New Sales <sup>1</sup>	Compliant Turnover Sales (million)	Energy Savings (Gwh/yr)	Energy Savings (\$M)	Present Value of Savings (\$M)	Costs (\$M)	Present Value of Costs (\$M)	Net Savings With Regulations (\$M)	Compliance of New Sales <sup>2</sup>	Compliant Turnover Sales (million)	Energy Savings (Gwh/yr)	Energy Savings (\$M)	Present Value of Savings (\$M)													
a	b	c	d = 1 / Design Life	e = 100%	f = c * d * e	g = b * f	h = g * \$0.14	i = h / (1.03)^a	j = f * Unit Cost of Regulation	k = j / (1.03)^a	l = i - k	m = Compliance + 4(10%) + 10% * (a - 1)	n = c * d * m	o = b * n	p = o * \$0.14	q = p / (1.03)^a													
1	313.90	2.09	10%	100%	0.21	65.61	\$ 9.18	\$ 8.92	\$ 2.09	\$ 2.03	\$ 6.89	40%	0.08	26.24	\$ 3.67	\$ 3.57													
2	313.90	2.09	10%	100%	0.21	65.61	\$ 9.18	\$ 8.66	\$ 2.09	\$ 1.97	\$ 6.69	50%	0.10	32.80	\$ 4.59	\$ 4.33													
3	313.90	2.09	10%	100%	0.21	65.61	\$ 9.18	\$ 8.41	\$ 2.09	\$ 1.91	\$ 6.49	60%	0.13	39.36	\$ 5.51	\$ 5.04													
4	313.90	2.09	10%	100%	0.21	65.61	\$ 9.18	\$ 8.16	\$ 2.09	\$ 1.86	\$ 6.30	70%	0.15	45.92	\$ 6.43	\$ 5.71													
5	313.90	2.09	10%	100%	0.21	65.61	\$ 9.18	\$ 7.92	\$ 2.09	\$ 1.80	\$ 6.12	80%	0.17	52.48	\$ 7.35	\$ 6.34													
6	313.90	2.09	10%	100%	0.21	65.61	\$ 9.18	\$ 7.69	\$ 2.09	\$ 1.75	\$ 5.94	90%	0.19	59.04	\$ 8.27	\$ 6.92													
7	313.90	2.09	10%	100%	0.21	65.61	\$ 9.18	\$ 7.47	\$ 2.09	\$ 1.70	\$ 5.77	100%	0.21	65.61	\$ 9.18	\$ 7.47													
8	313.90	2.09	10%	100%	0.21	65.61	\$ 9.18	\$ 7.25	\$ 2.09	\$ 1.65	\$ 5.60	100%	0.21	65.61	\$ 9.18	\$ 7.25													
9	313.90	2.09	10%	100%	0.21	65.61	\$ 9.18	\$ 7.04	\$ 2.09	\$ 1.60	\$ 5.44	100%	0.21	65.61	\$ 9.18	\$ 7.04													
10	313.90	2.09	10%	100%	0.21	65.61	\$ 9.18	\$ 6.83	\$ 2.09	\$ 1.56	\$ 5.28	100%	0.21	65.61	\$ 9.18	\$ 6.83													
Total												\$	60.52		Total												\$	60.50	

## Notes and Sources:

- 1 100% compliance because the regulations will take effect in year 1.
- 2 Since year 1 represents 2013, and assuming a 10% growth rate based on a conservative estimate of Energy Star's market penetration growth, compliance in 2013 will assume a 40% increase in compliance from 2009, plus an additional 10% per year.  
[http://www.energystar.gov/index.cfm?c=partners.unit\\_shipment\\_data\\_archives](http://www.energystar.gov/index.cfm?c=partners.unit_shipment_data_archives)

## Cell Phones

Market Segment	Product	Design Life (Years)	Compliance	Unit Cost of Regulation (\$)	Unit Energy Savings (Kwh/yr)	First Year Unit Energy Savings (\$)	Stock 2009 (million)	Sales 2009 (million)	CAGR Sales 2010	CAGR Sales 2013	Sales 2010 (million)	Sales 2013 (million)	Stock 2013 (million)
Small Charger	Cell Phones	2.0	90%	\$0.00	0.45	<b>\$0.06</b>	47.9	28.27	19%	2%	33.64	41.65	59.1

\*These figures come from the CEC Report. See Appendices A-1 - A-7

Discount Rate	3%
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Net Savings Assuming Regulation										Net Savings Assuming No Regulation						
Year	Unit Energy Savings (Kwh/yr)	Stock Beginning of Year - 2013 (million)	Turnover	Compliance of New Sales <sup>1</sup>	Compliant Turnover Sales (million)	Energy Savings (Gwh/yr)	Energy Savings (\$M)	Present Value of Savings (\$M)	Costs (\$M)	Present Value of Costs (\$M)	Net Savings With Regulations (\$M)	Compliance of New Sales <sup>2</sup>	Compliant Turnover Sales (million)	Energy Savings (Gwh/yr)	Energy Savings (\$M)	Present Value of Savings (\$M)
a	b	c	d = 1 / Design Life	e = 100%	f = c * d * e	g = b * f	h = g * \$0.14	i = h / (1.03)^a	j = f * Unit Cost of Regulation	k = j / (1.03)^a	l = i * k	m = Compliance + 4(10%) + 10% * (a - 1)	n = c * d * m	o = b * n	p = o * \$0.14	q = p / (1.03)^a
1	0.45	59.10	50%	100%	29.55	13.30	\$ 1.86	\$ 1.81	\$ -	\$ -	\$ 1.81	100%	29.55	13.30	\$ 1.86	\$ 1.81
2	0.45	59.10	50%	100%	29.55	13.30	\$ 1.86	\$ 1.75	\$ -	\$ -	\$ 1.75	100%	29.55	13.30	\$ 1.86	\$ 1.75

Total	\$	3.56	Total	\$	3.56
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## Notes and Sources:

- 1 100% compliance because the regulations will take effect in year 1.
- 2 Since year 1 represents 2013, and assuming a 10% growth rate based on a conservative estimate of Energy Star's market penetration growth, compliance in 2013 will assume a 40% increase in compliance from 2009, plus an additional 10% per year.  
[http://www.energystar.gov/index.cfm?c=partners.unit\\_shipment\\_data\\_archives](http://www.energystar.gov/index.cfm?c=partners.unit_shipment_data_archives)

## Cordless Phones

Market Segment	Product	Design Life (Years)	Compliance	Unit Cost of Regulation (\$)	Unit Energy Savings (Kwh/yr)	First Year Unit Energy Savings (\$)	Stock 2009 (million)	Sales 2009 (million)	CAGR Sales 2010	CAGR Sales 2013	Sales 2010 (million)	Sales 2013 (million)	Stock 2013 (million)
Small Charger	Cordless Phones	5.0	0%	\$0.00	0.00	<b>\$0.00</b>	20.5	3.21	-10%	-9%	2.89	2.15	13.3

\*These figures come from the CEC Report. See Appendices A-1 - A-7

Discount Rate	3%
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Net Savings Assuming Regulation												Net Savings Assuming No Regulation				
Year	Unit Energy Savings (Kwh/yr)	Stock Beginning of Year - 2013 (million)	Turnover	Compliance of New Sales <sup>1</sup>	Compliant Turnover Sales (million)	Energy Savings (Gwh/yr)	Energy Savings (\$M)	Present Value of Savings (\$M)	Costs (\$M)	Present Value of Costs (\$M)	Net Savings With Regulations (\$M)	Compliance of New Sales <sup>2</sup>	Compliant Turnover Sales (million)	Energy Savings (Gwh/yr)	Energy Savings (\$M)	Present Value of Savings (\$M)
a	b	c	d = 1 / Design Life	e = 100%	f = c * d * e	g = b * f	h = g * \$0.14	i = h / (1.03)^a	j = f * Unit Cost of Regulation	k = j / (1.03)^a	l = i - k	m = Compliance + 4(10%) + 10% * (a - 1)	n = c * d * m	o = b * n	p = o * \$0.14	q = p / (1.03)^a
1	0.00	13.30	20%	100%	2.66	-	\$ -	\$ -	\$ -	\$ -	\$ -	40%	1.06	-	\$ -	\$ -
2	0.00	13.30	20%	100%	2.66	-	\$ -	\$ -	\$ -	\$ -	\$ -	50%	1.33	-	\$ -	\$ -
3	0.00	13.30	20%	100%	2.66	-	\$ -	\$ -	\$ -	\$ -	\$ -	60%	1.60	-	\$ -	\$ -
4	0.00	13.30	20%	100%	2.66	-	\$ -	\$ -	\$ -	\$ -	\$ -	70%	1.86	-	\$ -	\$ -
5	0.00	13.30	20%	100%	2.66	-	\$ -	\$ -	\$ -	\$ -	\$ -	80%	2.13	-	\$ -	\$ -

Total	\$ -	Total	\$ -
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## Notes and Sources:

- 100% compliance because the regulations will take effect in year 1.
- Since year 1 represents 2013, and assuming a 10% growth rate based on a conservative estimate of Energy Star's market penetration growth, compliance in 2013 will assume a 40% increase in compliance from 2009, plus an additional 10% per year.  
[http://www.energystar.gov/index.cfm?c=partners.unit\\_shipment\\_data\\_archives](http://www.energystar.gov/index.cfm?c=partners.unit_shipment_data_archives)

## Personal Audio Electronics

Market Segment	Product	Design Life (Years)	Compliance	Unit Cost of Regulation (\$)	Unit Energy Savings (Kwh/yr)	First Year Unit Energy Savings (\$)	Stock 2009 (million)	Sales 2009 (million)	CAGR Sales 2010	CAGR Sales 2013	Sales 2010 (million)	Sales 2013 (million)	Stock 2013 (million)
Small Charger	Personal Audio Electronics	3.0	90%	\$0.00	0.49	<b>\$0.07</b>	29.8	10.52	12%	2%	11.78	13.73	31.6

\*These figures come from the CEC Report. See Appendices A-1 - A-7

Discount Rate	3%
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Net Savings Assuming Regulation												Net Savings Assuming No Regulation				
Year	Unit Energy Savings (Kwh/yr)	Stock Beginning of Year - 2013 (million)	Turnover	Compliance of New Sales <sup>1</sup>	Compliant Turnover Sales (million)	Energy Savings (Gwh/yr)	Energy Savings (\$M)	Present Value of Savings (\$M)	Costs (\$M)	Present Value of Costs (\$M)	Net Savings With Regulations (\$M)	Compliance of New Sales <sup>2</sup>	Compliant Turnover Sales (million)	Energy Savings (Gwh/yr)	Energy Savings (\$M)	Present Value of Savings (\$M)
a	b	c	d	e	f	g	h	i	j	k	l	m	n	o	p	q
			= 1 / Design Life	= 100%	= c * d * e	= b * f	= g * \$0.14	= h / (1.03)^a	= f * Unit Cost of Regulation	= j / (1.03)^a	= i - k	= Compliance + 4(10%) + 10% * (a - 1)	= c * d * m	= b * n	= o * \$0.14	= p / (1.03)^a
1	0.49	31.60	33%	100%	10.53	5.16	\$ 0.72	\$ 0.70	\$ -	\$ -	\$ 0.70	100%	10.53	5.16	\$ 0.72	\$ 0.70
2	0.49	31.60	33%	100%	10.53	5.16	\$ 0.72	\$ 0.68	\$ -	\$ -	\$ 0.68	100%	10.53	5.16	\$ 0.72	\$ 0.68
3	0.49	31.60	33%	100%	10.53	5.16	\$ 0.72	\$ 0.66	\$ -	\$ -	\$ 0.66	100%	10.53	5.16	\$ 0.72	\$ 0.66

<b>Total</b>	<b>\$</b>	<b>2.04</b>	<b>Total</b>	<b>\$</b>	<b>2.04</b>
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## Notes and Sources:

- 1 100% compliance because the regulations will take effect in year 1.
- 2 Since year 1 represents 2013, and assuming a 10% growth rate based on a conservative estimate of Energy Star's market penetration growth, compliance in 2013 will assume a 40% increase in compliance from 2009, plus an additional 10% per year.  
[http://www.energystar.gov/index.cfm?c=partners.unit\\_shipment\\_data\\_archives](http://www.energystar.gov/index.cfm?c=partners.unit_shipment_data_archives)

## Emergency Systems

Market Segment	Product	Design Life (Years)	Compliance	Unit Cost of Regulation (\$)	Unit Energy Savings (Kwh/yr)	First Year Unit Energy Savings (\$)	Stock 2009 (million)	Sales 2009 (million)	CAGR Sales 2010	CAGR Sales 2013	Sales 2010 (million)	Sales 2013 (million)	Stock 2013 (million)
Small Charger	Emergency Systems	7.0	10%	\$3.00	15.87	\$2.22	5.3	1.3	0%	0%	1.3	1.3	5.4

\*These figures come from the CEC Report. See Appendices A-1 - A-7

Discount Rate	3%
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Net Savings Assuming Regulation											Net Savings Assuming No Regulation					
Year	Unit Energy Savings (Kwh/yr)	Stock Beginning of Year - 2013 (million)	Turnover	Compliance of New Sales <sup>1</sup>	Compliant Turnover Sales (million)	Energy Savings (Gwh/yr)	Energy Savings (\$M)	Present Value of Savings (\$M)	Costs (\$M)	Present Value of Costs (\$M)	Net Savings With Regulations (\$M)	Compliance of New Sales <sup>2</sup>	Compliant Turnover Sales (million)	Energy Savings (Gwh/yr)	Energy Savings (\$M)	Present Value of Savings (\$M)
a	b	c	d = 1 / Design Life	e = 100%	f = c * d * e	g = b * f	h = g * \$0.14	i = h / (1.03)^a	j = f * Unit Cost of Regulation	k = j / (1.03)^a	l = i - k	m = Compliance + 4(10%) + 10% * (a - 1)	n = c * d * m	o = b * n	p = o * \$0.14	q = p / (1.03)^a
1	15.87	5.40	14%	100%	0.77	12.24	\$ 1.71	\$ 1.66	\$ 2.31	\$ 2.25	\$ (0.58)	50%	0.39	6.12	\$ 0.86	\$ 0.83
2	15.87	5.40	14%	100%	0.77	12.24	\$ 1.71	\$ 1.62	\$ 2.31	\$ 2.18	\$ (0.57)	60%	0.46	7.35	\$ 1.03	\$ 0.97
3	15.87	5.40	14%	100%	0.77	12.24	\$ 1.71	\$ 1.57	\$ 2.31	\$ 2.12	\$ (0.55)	70%	0.54	8.57	\$ 1.20	\$ 1.10
4	15.87	5.40	14%	100%	0.77	12.24	\$ 1.71	\$ 1.52	\$ 2.31	\$ 2.06	\$ (0.53)	80%	0.62	9.79	\$ 1.37	\$ 1.22
5	15.87	5.40	14%	100%	0.77	12.24	\$ 1.71	\$ 1.48	\$ 2.31	\$ 2.00	\$ (0.52)	90%	0.69	11.02	\$ 1.54	\$ 1.33
6	15.87	5.40	14%	100%	0.77	12.24	\$ 1.71	\$ 1.44	\$ 2.31	\$ 1.94	\$ (0.50)	100%	0.77	12.24	\$ 1.71	\$ 1.44
7	15.87	5.40	14%	100%	0.77	12.24	\$ 1.71	\$ 1.39	\$ 2.31	\$ 1.88	\$ (0.49)	100%	0.77	12.24	\$ 1.71	\$ 1.39

Total	\$	(3.74)	Total	\$	8.28
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## Notes and Sources:

1 100% compliance because the regulations will take effect in year 1.

2 Since year 1 represents 2013, and assuming a 10% growth rate based on a conservative estimate of Energy Star's market penetration growth, compliance in 2013 will assume a 40% increase in compliance from 2009, plus an additional 10% per year.  
[http://www.energystar.gov/index.cfm?c=partners.unit\\_shipment\\_data\\_archives](http://www.energystar.gov/index.cfm?c=partners.unit_shipment_data_archives)

## Laptops

Market Segment	Product	Design Life (Years)	Compliance	Unit Cost of Regulation (\$)	Unit Energy Savings (Kwh/yr)	First Year Unit Energy Savings (\$)	Stock 2009 (million)	Sales 2009 (million)	CAGR Sales 2010	CAGR Sales 2013	Sales 2010 (million)	Sales 2013 (million)	Stock 2013 (million)
Small Charger	Laptops	4.0	10%	\$0.03	0.00	\$0.00	16	4.57	29%	12%	5.9	9.54	24.4

\*These figures come from the CEC Report. See Appendices A-1 - A-7

Discount Rate	3%
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Net Savings Assuming Regulation										Net Savings Assuming No Regulation							
Year	Unit Energy Savings (Kwh/yr)	Stock Beginning of Year - 2013 (million)	Turnover	Compliance of New Sales <sup>1</sup>	Compliant Turnover Sales (million)	Energy Savings (Gwh/yr)	Energy Savings (\$M)	Present Value of Savings (\$M)	Costs (\$M)	Present Value of Costs (\$M)	Net Savings With Regulations (\$M)	Compliance of New Sales <sup>2</sup>	Compliant Turnover Sales (million)	Energy Savings (Gwh/yr)	Energy Savings (\$M)	Present Value of Savings (\$M)	
a	b	c	d = 1 / Design Life	e = 100%	f = c * d * e	g = b * f	h = g * \$0.14	i = h / (1.03)^a	j = f * Unit Cost of Regulation	k = j / (1.03)^a	l = i * k	m = Compliance + 4(10%) + 10% * (a - 1)	n = c * d * m	o = b * n	p = o * \$0.14	q = p / (1.03)^a	
1	0.00	24.40	25%	100%	6.10	-	\$ -	\$ -	\$ 0.18	\$ 0.18	\$ (0.18)	50%	3.05	-	\$ -	\$ -	
2	0.00	24.40	25%	100%	6.10	-	\$ -	\$ -	\$ 0.18	\$ 0.17	\$ (0.17)	60%	3.66	-	\$ -	\$ -	
3	0.00	24.40	25%	100%	6.10	-	\$ -	\$ -	\$ 0.18	\$ 0.17	\$ (0.17)	70%	4.27	-	\$ -	\$ -	
4	0.00	24.40	25%	100%	6.10	-	\$ -	\$ -	\$ 0.18	\$ 0.16	\$ (0.16)	80%	4.88	-	\$ -	\$ -	
Total											\$ (0.68)	Total					\$ -

## Notes and Sources:

1 100% compliance because the regulations will take effect in year 1.

2 Since year 1 represents 2013, and assuming a 10% growth rate based on a conservative estimate of Energy Star's market penetration growth, compliance in 2013 will assume a 40% increase in compliance from 2009, plus an additional 10% per year.  
[http://www.energystar.gov/index.cfm?c=partners.unit\\_shipment\\_data\\_archives](http://www.energystar.gov/index.cfm?c=partners.unit_shipment_data_archives)



## Personal Care

Market Segment	Product	Design Life (Years)	Compliance	Unit Cost of Regulation (\$)	Unit Energy Savings (Kwh/yr)	First Year Unit Energy Savings (\$)	Stock 2009 (million)	Sales 2009 (million)	CAGR Sales 2010	CAGR Sales 2013	Sales 2010 (million)	Sales 2013 (million)	Stock 2013 (million)
Small Charger	Personal Care	5.0	0%	\$0.40	1.81	\$0.25	8.7	1.84	4%	3%	1.91	2.11	9.68

\*These figures come from the CEC Report. See Appendices A-1 - A-7

Discount Rate	3%
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Net Savings Assuming Regulation										Net Savings Assuming No Regulation							
Year	Unit Energy Savings (Kwh/yr)	Stock Beginning of Year - 2013 (million)	Turnover	Compliance of New Sales <sup>1</sup>	Compliant Turnover Sales (million)	Energy Savings (Gwh/yr)	Energy Savings (\$M)	Present Value of Savings (\$M)	Costs (\$M)	Present Value of Costs (\$M)	Net Savings With Regulations (\$M)	Compliance of New Sales <sup>2</sup>	Compliant Turnover Sales (million)	Energy Savings (Gwh/yr)	Energy Savings (\$M)	Present Value of Savings (\$M)	
a	b	c	d = 1 / Design Life	e = 100%	f = c * d * e	g = b * f	h = g * \$0.14	i = h / (1.03)^a	j = f * Unit Cost of Regulation	k = j / (1.03)^a	l = i - k	m = Compliance + 4(10%) + 10% * (a - 1)	n = c * d * m	o = b * n	p = o * \$0.14	q = p / (1.03)^a	
1	1.81	9.68	20%	100%	1.94	3.50	\$ 0.49	\$ 0.48	\$ 0.77	\$ 0.75	\$ (0.28)	40%	0.77	1.40	\$ 0.20	\$ 0.19	
2	1.81	9.68	20%	100%	1.94	3.50	\$ 0.49	\$ 0.46	\$ 0.77	\$ 0.73	\$ (0.27)	50%	0.97	1.75	\$ 0.25	\$ 0.23	
3	1.81	9.68	20%	100%	1.94	3.50	\$ 0.49	\$ 0.45	\$ 0.77	\$ 0.71	\$ (0.26)	60%	1.16	2.10	\$ 0.29	\$ 0.27	
4	1.81	9.68	20%	100%	1.94	3.50	\$ 0.49	\$ 0.44	\$ 0.77	\$ 0.69	\$ (0.25)	70%	1.36	2.45	\$ 0.34	\$ 0.31	
5	1.81	9.68	20%	100%	1.94	3.50	\$ 0.49	\$ 0.42	\$ 0.77	\$ 0.67	\$ (0.24)	80%	1.55	2.80	\$ 0.39	\$ 0.34	
Total											\$ (1.30)	Total					\$ 1.33

## Notes and Sources:

- 100% compliance because the regulations will take effect in year 1.
- Since year 1 represents 2013, and assuming a 10% growth rate based on a conservative estimate of Energy Star's market penetration growth, compliance in 2013 will assume a 40% increase in compliance from 2009, plus an additional 10% per year.  
[http://www.energystar.gov/index.cfm?c=partners.unit\\_shipment\\_data\\_archives](http://www.energystar.gov/index.cfm?c=partners.unit_shipment_data_archives)

## Personal Electric Vehicles

Market Segment	Product	Design Life (Years)	Compliance	Unit Cost of Regulation (\$)	Unit Energy Savings (Kwh/yr)	First Year Unit Energy Savings (\$)	Stock 2009 (million)	Sales 2009 (million)	CAGR Sales 2010	CAGR Sales 2013	Sales 2010 (million)	Sales 2013 (million)	Stock 2013 (million)
Small Charger	Personal Electric Vehicles	9.7	10%	\$12.00	536.84	\$75.16	0.1	0.04	18%	24%	0.05	0.09	0.22

\*These figures come from the CEC Report. See Appendices A-1 - A-7

Discount Rate	3%
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Net Savings Assuming Regulation												Net Savings Assuming No Regulation				
Year	Unit Energy Savings (Kwh/yr)	Stock Beginning of Year - 2013 (million)	Turnover	Compliance of New Sales <sup>1</sup>	Compliant Turnover Sales (million)	Energy Savings (Gwh/yr)	Energy Savings (\$M)	Present Value of Savings (\$M)	Costs (\$M)	Present Value of Costs (\$M)	Net Savings With Regulations (\$M)	Compliance of New Sales <sup>2</sup>	Compliant Turnover Sales (million)	Energy Savings (Gwh/yr)	Energy Savings (\$M)	Present Value of Savings (\$M)
a	b	c	d  = 1 / Design Life	e  = 100%	f  = c * d * e	g  = b * f	h  = g * \$0.14	i  = h / (1.03)^a	j  = f * Unit Cost of Regulation	k  = j / (1.03)^a	l  = i - k	m  = Compliance + 4(10%) + 10% * (a - 1)	n  = c * d * m	o  = b * n	p  = o * \$0.14	q  = p / (1.03)^a
1	536.84	0.22	10%	100%	0.02	12.18	\$ 1.70	\$ 1.65	\$ 0.27	\$ 0.26	\$ 1.39	50%	0.01	6.09	\$ 0.85	\$ 0.83
2	536.84	0.22	10%	100%	0.02	12.18	\$ 1.70	\$ 1.61	\$ 0.27	\$ 0.26	\$ 1.35	60%	0.01	7.31	\$ 1.02	\$ 0.96
3	536.84	0.22	10%	100%	0.02	12.18	\$ 1.70	\$ 1.56	\$ 0.27	\$ 0.25	\$ 1.31	70%	0.02	8.52	\$ 1.19	\$ 1.09
4	536.84	0.22	10%	100%	0.02	12.18	\$ 1.70	\$ 1.51	\$ 0.27	\$ 0.24	\$ 1.27	80%	0.02	9.74	\$ 1.36	\$ 1.21
5	536.84	0.22	10%	100%	0.02	12.18	\$ 1.70	\$ 1.47	\$ 0.27	\$ 0.23	\$ 1.24	90%	0.02	10.96	\$ 1.53	\$ 1.32
6	536.84	0.22	10%	100%	0.02	12.18	\$ 1.70	\$ 1.43	\$ 0.27	\$ 0.23	\$ 1.20	100%	0.02	12.18	\$ 1.70	\$ 1.43
7	536.84	0.22	10%	100%	0.02	12.18	\$ 1.70	\$ 1.39	\$ 0.27	\$ 0.22	\$ 1.16	100%	0.02	12.18	\$ 1.70	\$ 1.39
8	536.84	0.22	10%	100%	0.02	12.18	\$ 1.70	\$ 1.35	\$ 0.27	\$ 0.21	\$ 1.13	100%	0.02	12.18	\$ 1.70	\$ 1.35
9	536.84	0.22	10%	100%	0.02	12.18	\$ 1.70	\$ 1.31	\$ 0.27	\$ 0.21	\$ 1.10	100%	0.02	12.18	\$ 1.70	\$ 1.31
9.7	536.84	0.22	10%	100%	0.02	8.52	\$ 1.19	\$ 0.90	\$ 0.19	\$ 0.14	\$ 0.75	100%	0.02	8.52	\$ 1.19	\$ 0.90

Total	\$	11.91	Total	\$	11.78
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## Notes and Sources:

- 1 100% compliance because the regulations will take effect in year 1.
- 2 Since year 1 represents 2013, and assuming a 10% growth rate based on a conservative estimate of Energy Star's market penetration growth, compliance in 2013 will assume a 40% increase in compliance from 2009, plus an additional 10% per year.  
[http://www.energystar.gov/index.cfm?c=partners.unit\\_shipment\\_data\\_archives](http://www.energystar.gov/index.cfm?c=partners.unit_shipment_data_archives)

## Portable Electronics

Market Segment	Product	Design Life (Years)	Compliance	Unit Cost of Regulation (\$)	Unit Energy Savings (Kwh/yr)	First Year Unit Energy Savings (\$)	Stock 2009 (million)	Sales 2009 (million)	CAGR Sales 2010	CAGR Sales 2013	Sales 2010 (million)	Sales 2013 (million)	Stock 2013 (million)
Small Charger	Portable Electronics	5.2	10%	\$0.40	1.71	<b>\$0.24</b>	10.3	2	9%	18%	2.18	3.31	18.5

\*These figures come from the CEC Report. See Appendices A-1 - A-7

Discount Rate	3%
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Net Savings Assuming Regulation										Net Savings Assuming No Regulation						
Year	Unit Energy Savings (Kwh/yr)	Stock Beginning of Year - 2013 (million)	Turnover	Compliance of New Sales <sup>1</sup>	Compliant Turnover Sales (million)	Energy Savings (Gwh/yr)	Energy Savings (\$M)	Present Value of Savings (\$M)	Costs (\$M)	Present Value of Costs (\$M)	Net Savings With Regulations (\$M)	Compliance of New Sales <sup>2</sup>	Compliant Turnover Sales (million)	Energy Savings (Gwh/yr)	Energy Savings (\$M)	Present Value of Savings (\$M)
a	b	c	d	e	f	g	h	i	j	k	l	m	n	o	p	q
			= 1 / Design Life	= 100%	= c * d * e	= b * f	= g * \$0.14	= h / (1.03)^a	= f * Unit Cost of Regulation	= j / (1.03)^a	= i - k	= Compliance + 4(10%) + 10% * (a - 1)	= c * d * m	= b * n	= o * \$0.14	= p / (1.03)^a
1	1.71	18.50	19%	100%	3.56	6.08	\$ 0.85	\$ 0.83	\$ 1.42	\$ 1.38	\$ (0.55)	50%	1.78	3.04	\$ 0.43	\$ 0.41
2	1.71	18.50	19%	100%	3.56	6.08	\$ 0.85	\$ 0.80	\$ 1.42	\$ 1.34	\$ (0.54)	60%	2.13	3.65	\$ 0.51	\$ 0.48
3	1.71	18.50	19%	100%	3.56	6.08	\$ 0.85	\$ 0.78	\$ 1.42	\$ 1.30	\$ (0.52)	70%	2.49	4.26	\$ 0.60	\$ 0.55
4	1.71	18.50	19%	100%	3.56	6.08	\$ 0.85	\$ 0.76	\$ 1.42	\$ 1.26	\$ (0.51)	80%	2.85	4.87	\$ 0.68	\$ 0.61
5	1.71	18.50	19%	100%	3.56	6.08	\$ 0.85	\$ 0.73	\$ 1.42	\$ 1.23	\$ (0.49)	90%	3.20	5.48	\$ 0.77	\$ 0.66
5.2	1.71	18.50	19%	100%	0.71	1.22	\$ 0.17	\$ 0.15	\$ 0.28	\$ 0.24	\$ (0.10)	100%	0.71	1.22	\$ 0.17	\$ 0.15

<b>Total</b>	<b>\$</b>	<b>(2.71)</b>	<b>Total</b>	<b>\$</b>	<b>2.85</b>
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## Notes and Sources:

- 100% compliance because the regulations will take effect in year 1.
- Since year 1 represents 2013, and assuming a 10% growth rate based on a conservative estimate of Energy Star's market penetration growth, compliance in 2013 will assume a 40% increase in compliance from 2009, plus an additional 10% per year.  
[http://www.energystar.gov/index.cfm?c=partners.unit\\_shipment\\_data\\_archives](http://www.energystar.gov/index.cfm?c=partners.unit_shipment_data_archives)

## Portable Lighting

Market Segment	Product	Design Life (Years)	Compliance	Unit Cost of Regulation (\$)	Unit Energy Savings (Kwh/yr)	First Year Unit Energy Savings (\$)	Stock 2009 (million)	Sales 2009 (million)	CAGR Sales 2010	CAGR Sales 2013	Sales 2010 (million)	Sales 2013 (million)	Stock 2013 (million)
Small Charger	Portable Lighting	10.0	0%	\$0.40	8.62	\$1.21	1.2	0.01	1%	1%	0.01	0.01	1.2

\*These figures come from the CEC Report. See Appendices A-1 - A-7

Discount Rate	3%
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Net Savings Assuming Regulation										Net Savings Assuming No Regulation						
Year	Unit Energy Savings (Kwh/yr)	Stock Beginning of Year - 2013 (million)	Turnover	Compliance of New Sales <sup>1</sup>	Compliant Turnover Sales (million)	Energy Savings (Gwh/yr)	Energy Savings (\$M)	Present Value of Savings (\$M)	Costs (\$M)	Present Value of Costs (\$M)	Net Savings With Regulations (\$M)	Compliance of New Sales <sup>2</sup>	Compliant Turnover Sales (million)	Energy Savings (Gwh/yr)	Energy Savings (\$M)	Present Value of Savings (\$M)
a	b	c	d = 1 / Design Life	e = 100%	f = c * d * e	g = b * f	h = g * \$0.14	i = h / (1.03)^a	j = f * Unit Cost of Regulation	k = j / (1.03)^a	l = i - k	m = Compliance + 4(10%) + 10% * (a - 1)	n = c * d * m	o = b * n	p = o * \$0.14	q = p / (1.03)^a
1	8.62	1.20	10%	100%	0.12	1.03	\$ 0.14	\$ 0.14	\$ 0.05	\$ 0.05	\$ 0.09	40%	0.05	0.41	\$ 0.06	\$ 0.06
2	8.62	1.20	10%	100%	0.12	1.03	\$ 0.14	\$ 0.14	\$ 0.05	\$ 0.05	\$ 0.09	50%	0.06	0.52	\$ 0.07	\$ 0.07
3	8.62	1.20	10%	100%	0.12	1.03	\$ 0.14	\$ 0.13	\$ 0.05	\$ 0.04	\$ 0.09	60%	0.07	0.62	\$ 0.09	\$ 0.08
4	8.62	1.20	10%	100%	0.12	1.03	\$ 0.14	\$ 0.13	\$ 0.05	\$ 0.04	\$ 0.09	70%	0.08	0.72	\$ 0.10	\$ 0.09
5	8.62	1.20	10%	100%	0.12	1.03	\$ 0.14	\$ 0.12	\$ 0.05	\$ 0.04	\$ 0.08	80%	0.10	0.83	\$ 0.12	\$ 0.10
6	8.62	1.20	10%	100%	0.12	1.03	\$ 0.14	\$ 0.12	\$ 0.05	\$ 0.04	\$ 0.08	90%	0.11	0.93	\$ 0.13	\$ 0.11
7	8.62	1.20	10%	100%	0.12	1.03	\$ 0.14	\$ 0.12	\$ 0.05	\$ 0.04	\$ 0.08	100%	0.12	1.03	\$ 0.14	\$ 0.12
8	8.62	1.20	10%	100%	0.12	1.03	\$ 0.14	\$ 0.11	\$ 0.05	\$ 0.04	\$ 0.08	100%	0.12	1.03	\$ 0.14	\$ 0.11
9	8.62	1.20	10%	100%	0.12	1.03	\$ 0.14	\$ 0.11	\$ 0.05	\$ 0.04	\$ 0.07	100%	0.12	1.03	\$ 0.14	\$ 0.11
10	8.62	1.20	10%	100%	0.12	1.03	\$ 0.14	\$ 0.11	\$ 0.05	\$ 0.04	\$ 0.07	100%	0.12	1.03	\$ 0.14	\$ 0.11

<b>Total</b>	<b>\$</b>	<b>0.83</b>	<b>Total</b>	<b>\$</b>	<b>0.95</b>
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## Notes and Sources:

- 1 100% compliance because the regulations will take effect in year 1.
- 2 Since year 1 represents 2013, and assuming a 10% growth rate based on a conservative estimate of Energy Star's market penetration growth, compliance in 2013 will assume a 40% increase in compliance from 2009, plus an additional 10% per year.  
[http://www.energystar.gov/index.cfm?c=partners.unit\\_shipment\\_data\\_archives](http://www.energystar.gov/index.cfm?c=partners.unit_shipment_data_archives)

## Power Tools

Market Segment	Product	Design Life (Years)	Compliance	Unit Cost of Regulation (\$)	Unit Energy Savings (Kwh/yr)	First Year Unit Energy Savings (\$)	Stock 2009 (million)	Sales 2009 (million)	CAGR Sales 2010	CAGR Sales 2013	Sales 2010 (million)	Sales 2013 (million)	Stock 2013 (million)
Small Charger	Power Tools	6.5	10%	\$3.76	11.32	<b>\$1.58</b>	15.3	2.87	5%	5%	3.01	3.49	18.6

\*These figures come from the CEC Report. See Appendices A-1 - A-7

Discount Rate	3%
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Net Savings Assuming Regulation										Net Savings Assuming No Regulation						
Year	Unit Energy Savings (Kwh/yr)	Stock Beginning of Year - 2013 (million)	Turnover	Compliance of New Sales <sup>1</sup>	Compliant Turnover Sales (million)	Energy Savings (Gwh/yr)	Energy Savings (\$M)	Present Value of Savings (\$M)	Costs (\$M)	Present Value of Costs (\$M)	Net Savings With Regulations (\$M)	Compliance of New Sales <sup>2</sup>	Compliant Turnover Sales (million)	Energy Savings (Gwh/yr)	Energy Savings (\$M)	Present Value of Savings (\$M)
a	b	c	d	e	f	g	h	i	j	k	l	m	n	o	p	q
			= 1 / Design Life	= 100%	= c * d * e	= b * f	= g * \$0.14	= h / (1.03)^a	= f * Unit Cost of Regulation	= j / (1.03)^a	= i - k	= Compliance + 4(10%) + 10% * (a - 1)	= c * d * m	= b * n	= o * \$0.14	= p / (1.03)^a
1	11.32	18.60	15%	100%	2.86	32.39	\$ 4.53	\$ 4.40	\$ 10.76	\$ 10.45	\$ (6.04)	50%	1.43	16.20	\$ 2.27	\$ 2.20
2	11.32	18.60	15%	100%	2.86	32.39	\$ 4.53	\$ 4.27	\$ 10.76	\$ 10.14	\$ (5.87)	60%	1.72	19.44	\$ 2.72	\$ 2.56
3	11.32	18.60	15%	100%	2.86	32.39	\$ 4.53	\$ 4.15	\$ 10.76	\$ 9.85	\$ (5.70)	70%	2.00	22.67	\$ 3.17	\$ 2.91
4	11.32	18.60	15%	100%	2.86	32.39	\$ 4.53	\$ 4.03	\$ 10.76	\$ 9.56	\$ (5.53)	80%	2.29	25.91	\$ 3.63	\$ 3.22
5	11.32	18.60	15%	100%	2.86	32.39	\$ 4.53	\$ 3.91	\$ 10.76	\$ 9.28	\$ (5.37)	90%	2.58	29.15	\$ 4.08	\$ 3.52
6	11.32	18.60	15%	100%	2.86	32.39	\$ 4.53	\$ 3.80	\$ 10.76	\$ 9.01	\$ (5.21)	100%	2.86	32.39	\$ 4.53	\$ 3.80
6.5	11.32	18.60	15%	100%	1.43	16.20	\$ 2.27	\$ 1.87	\$ 5.38	\$ 4.44	\$ (2.57)	100%	1.43	16.20	\$ 2.27	\$ 1.87

<b>Total</b>	<b>\$ (36.29)</b>	<b>Total</b>	<b>\$ 20.08</b>
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## Notes and Sources:

1 100% compliance because the regulations will take effect in year 1.

2 Since year 1 represents 2013, and assuming a 10% growth rate based on a conservative estimate of Energy Star's market penetration growth, compliance in 2013 will assume a 40% increase in compliance from 2009, plus an additional 10% per year.  
[http://www.energystar.gov/index.cfm?c=partners.unit\\_shipment\\_data\\_archives](http://www.energystar.gov/index.cfm?c=partners.unit_shipment_data_archives)

## Universal Battery Charger

Market Segment	Product	Design Life (Years)	Compliance	Unit Cost of Regulation (\$)	Unit Energy Savings (Kwh/yr)	First Year Unit Energy Savings (\$)	Stock 2009 (million)	Sales 2009 (million)	CAGR Sales 2010	CAGR Sales 2013	Sales 2010 (million)	Sales 2013 (million)	Stock 2013 (million)
Small Charger	Universal Battery Charger	8.0	50%	\$0.40	3.93	\$0.55	0.9	0.11	3%	3%	0.11	0.12	1

\*These figures come from the CEC Report. See Appendices A-1 - A-7

Discount Rate	3%
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Net Savings Assuming Regulation										Net Savings Assuming No Regulation						
Year	Unit Energy Savings (Kwh/yr)	Stock Beginning of Year - 2013 (million)	Turnover	Compliance of New Sales <sup>1</sup>	Compliant Turnover Sales (million)	Energy Savings (Gwh/yr)	Energy Savings (\$M)	Present Value of Savings (\$M)	Costs (\$M)	Present Value of Costs (\$M)	Net Savings With Regulations (\$M)	Compliance of New Sales <sup>2</sup>	Compliant Turnover Sales (million)	Energy Savings (Gwh/yr)	Energy Savings (\$M)	Present Value of Savings (\$M)
a	b	c	d = 1 / Design Life	e = 100%	f = c * d * e	g = b * f	h = g * \$0.14	i = h / (1.03)^a	j = f * Unit Cost of Regulation	k = j / (1.03)^a	l = i - k	m = Compliance + 4(10%) + 10% * (a - 1)	n = c * d * m	o = b * n	p = o * \$0.14	q = p / (1.03)^a
1	3.93	1.00	13%	100%	0.13	0.49	\$ 0.07	\$ 0.07	\$ 0.05	\$ 0.05	\$ 0.02	90%	0.11	0.44	\$ 0.06	\$ 0.06
2	3.93	1.00	13%	100%	0.13	0.49	\$ 0.07	\$ 0.06	\$ 0.05	\$ 0.05	\$ 0.02	100%	0.13	0.49	\$ 0.07	\$ 0.06
3	3.93	1.00	13%	100%	0.13	0.49	\$ 0.07	\$ 0.06	\$ 0.05	\$ 0.05	\$ 0.02	100%	0.13	0.49	\$ 0.07	\$ 0.06
4	3.93	1.00	13%	100%	0.13	0.49	\$ 0.07	\$ 0.06	\$ 0.05	\$ 0.04	\$ 0.02	100%	0.13	0.49	\$ 0.07	\$ 0.06
5	3.93	1.00	13%	100%	0.13	0.49	\$ 0.07	\$ 0.06	\$ 0.05	\$ 0.04	\$ 0.02	100%	0.13	0.49	\$ 0.07	\$ 0.06
6	3.93	1.00	13%	100%	0.13	0.49	\$ 0.07	\$ 0.06	\$ 0.05	\$ 0.04	\$ 0.02	100%	0.13	0.49	\$ 0.07	\$ 0.06
7	3.93	1.00	13%	100%	0.13	0.49	\$ 0.07	\$ 0.06	\$ 0.05	\$ 0.04	\$ 0.02	100%	0.13	0.49	\$ 0.07	\$ 0.06
8	3.93	1.00	13%	100%	0.13	0.49	\$ 0.07	\$ 0.05	\$ 0.05	\$ 0.04	\$ 0.01	100%	0.13	0.49	\$ 0.07	\$ 0.05

<b>Total</b>	<b>\$</b>	<b>0.13</b>	<b>Total</b>	<b>\$</b>	<b>0.48</b>
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## Notes and Sources:

- 100% compliance because the regulations will take effect in year 1.
- Since year 1 represents 2013, and assuming a 10% growth rate based on a conservative estimate of Energy Star's market penetration growth, compliance in 2013 will assume a 40% increase in compliance from 2009, plus an additional 10% per year.  
[http://www.energystar.gov/index.cfm?c=partners.unit\\_shipment\\_data\\_archives](http://www.energystar.gov/index.cfm?c=partners.unit_shipment_data_archives)

## Golf Cart / Electric Carts

Market Segment	Product	Design Life (Years)	Compliance	Unit Cost of Regulation (\$)	Unit Energy Savings (Kwh/yr)	First Year Unit Energy Savings (\$)	Stock 2009 (million)	Sales 2009 (million)	CAGR Sales 2010	CAGR Sales 2013	Sales 2010 (million)	Sales 2013 (million)	Stock 2013 (million)
Small Charger	Golf Cart / Electric Carts	10.0	50%	\$200.00	807.62	\$113.07	0.175	0.017	16%	11%	0.02	0.03	0.248

\*These figures come from the CEC Report. See Appendices A-1 - A-7

Discount Rate	3%
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Net Savings Assuming Regulation											Net Savings Assuming No Regulation																
Year	Unit Energy Savings (Kwh/yr)	Stock Beginning of Year - 2013 (million)	Turnover	Compliance of New Sales <sup>1</sup>	Compliant Turnover Sales (million)	Energy Savings (Gwh/yr)	Energy Savings (\$M)	Present Value of Savings (\$M)	Costs (\$M)	Present Value of Costs (\$M)	Net Savings With Regulations (\$M)	Compliance of New Sales <sup>2</sup>	Compliant Turnover Sales (million)	Energy Savings (Gwh/yr)	Energy Savings (\$M)	Present Value of Savings (\$M)											
a	b	c	d  = 1 / Design Life	e  = 100%	f  = c * d * e	g  = b * f	h  = g * \$0.14	i  = h / (1.03)^a	j  = f * Unit Cost of Regulation	k  = j / (1.03)^a	l  = i - k	m  = Compliance + 4(10%) + 10% * (a - 1)	n  = c * d * m	o  = b * n	p  = o * \$0.14	q  = p / (1.03)^a											
1	807.62	0.25	10%	100%	0.02	20.03	\$ 2.80	\$ 2.72	\$ 4.96	\$ 4.82	\$ (2.09)	90%	0.02	18.03	\$ 2.52	\$ 2.45											
2	807.62	0.25	10%	100%	0.02	20.03	\$ 2.80	\$ 2.64	\$ 4.96	\$ 4.68	\$ (2.03)	100%	0.02	20.03	\$ 2.80	\$ 2.64											
3	807.62	0.25	10%	100%	0.02	20.03	\$ 2.80	\$ 2.57	\$ 4.96	\$ 4.54	\$ (1.97)	100%	0.02	20.03	\$ 2.80	\$ 2.57											
4	807.62	0.25	10%	100%	0.02	20.03	\$ 2.80	\$ 2.49	\$ 4.96	\$ 4.41	\$ (1.92)	100%	0.02	20.03	\$ 2.80	\$ 2.49											
5	807.62	0.25	10%	100%	0.02	20.03	\$ 2.80	\$ 2.42	\$ 4.96	\$ 4.28	\$ (1.86)	100%	0.02	20.03	\$ 2.80	\$ 2.42											
6	807.62	0.25	10%	100%	0.02	20.03	\$ 2.80	\$ 2.35	\$ 4.96	\$ 4.15	\$ (1.81)	100%	0.02	20.03	\$ 2.80	\$ 2.35											
7	807.62	0.25	10%	100%	0.02	20.03	\$ 2.80	\$ 2.28	\$ 4.96	\$ 4.03	\$ (1.75)	100%	0.02	20.03	\$ 2.80	\$ 2.28											
8	807.62	0.25	10%	100%	0.02	20.03	\$ 2.80	\$ 2.21	\$ 4.96	\$ 3.92	\$ (1.70)	100%	0.02	20.03	\$ 2.80	\$ 2.21											
9	807.62	0.25	10%	100%	0.02	20.03	\$ 2.80	\$ 2.15	\$ 4.96	\$ 3.80	\$ (1.65)	100%	0.02	20.03	\$ 2.80	\$ 2.15											
10	807.62	0.25	10%	100%	0.02	20.03	\$ 2.80	\$ 2.09	\$ 4.96	\$ 3.69	\$ (1.60)	100%	0.02	20.03	\$ 2.80	\$ 2.09											
Total											\$	(18.39)		Total											\$	23.65	

## Notes and Sources:

- 1 100% compliance because the regulations will take effect in year 1.
- 2 Since year 1 represents 2013, and assuming a 10% growth rate based on a conservative estimate of Energy Star's market penetration growth, compliance in 2013 will assume a 40% increase in compliance from 2009, plus an additional 10% per year.  
[http://www.energystar.gov/index.cfm?c=partners.unit\\_shipment\\_data\\_archives](http://www.energystar.gov/index.cfm?c=partners.unit_shipment_data_archives)

## Emergency Backup Lighting

Market Segment	Product	Design Life (Years)	Compliance	Unit Cost of Regulation (\$)	Unit Energy Savings (Kwh/yr)	First Year Unit Energy Savings (\$)	Stock 2009 (million)	Sales 2009 (million)	CAGR Sales 2010	CAGR Sales 2013	Sales 2010 (million)	Sales 2013 (million)	Stock 2013 (million)
Small Charger	Emergency Backup Lighting	10.0	50%	\$3.00	8.55	\$1.20	7.9	2	0%	0%	2	2	7.85

\*These figures come from the CEC Report. See Appendices A-1 - A-7

Discount Rate	3%
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Net Savings Assuming Regulation										Net Savings Assuming No Regulation						
Year	Unit Energy Savings (Kwh/yr)	Stock Beginning of Year - 2013 (million)	Turnover	Compliance of New Sales <sup>1</sup>	Compliant Turnover Sales (million)	Energy Savings (Gwh/yr)	Energy Savings (\$M)	Present Value of Savings (\$M)	Costs (\$M)	Present Value of Costs (\$M)	Net Savings With Regulations (\$M)	Compliance of New Sales <sup>2</sup>	Compliant Turnover Sales (million)	Energy Savings (Gwh/yr)	Energy Savings (\$M)	Present Value of Savings (\$M)
a	b	c	d = 1 / Design Life	e = 100%	f = c * d * e	g = b * f	h = g * \$0.14	i = h / (1.03)^a	j = f * Unit Cost of Regulation	k = j / (1.03)^a	l = i - k	m = Compliance + 4(10%) + 10% * (a - 1)	n = c * d * m	o = b * n	p = o * \$0.14	q = p / (1.03)^a
1	8.55	7.85	10%	100%	0.79	6.71	\$ 0.94	\$ 0.91	\$ 2.36	\$ 2.29	\$ (1.37)	90%	0.71	6.04	\$ 0.85	\$ 0.82
2	8.55	7.85	10%	100%	0.79	6.71	\$ 0.94	\$ 0.89	\$ 2.36	\$ 2.22	\$ (1.33)	100%	0.79	6.71	\$ 0.94	\$ 0.89
3	8.55	7.85	10%	100%	0.79	6.71	\$ 0.94	\$ 0.86	\$ 2.36	\$ 2.16	\$ (1.30)	100%	0.79	6.71	\$ 0.94	\$ 0.86
4	8.55	7.85	10%	100%	0.79	6.71	\$ 0.94	\$ 0.83	\$ 2.36	\$ 2.09	\$ (1.26)	100%	0.79	6.71	\$ 0.94	\$ 0.83
5	8.55	7.85	10%	100%	0.79	6.71	\$ 0.94	\$ 0.81	\$ 2.36	\$ 2.03	\$ (1.22)	100%	0.79	6.71	\$ 0.94	\$ 0.81
6	8.55	7.85	10%	100%	0.79	6.71	\$ 0.94	\$ 0.79	\$ 2.36	\$ 1.97	\$ (1.19)	100%	0.79	6.71	\$ 0.94	\$ 0.79
7	8.55	7.85	10%	100%	0.79	6.71	\$ 0.94	\$ 0.76	\$ 2.36	\$ 1.91	\$ (1.15)	100%	0.79	6.71	\$ 0.94	\$ 0.76
8	8.55	7.85	10%	100%	0.79	6.71	\$ 0.94	\$ 0.74	\$ 2.36	\$ 1.86	\$ (1.12)	100%	0.79	6.71	\$ 0.94	\$ 0.74
9	8.55	7.85	10%	100%	0.79	6.71	\$ 0.94	\$ 0.72	\$ 2.36	\$ 1.80	\$ (1.08)	100%	0.79	6.71	\$ 0.94	\$ 0.72
10	8.55	7.85	10%	100%	0.79	6.71	\$ 0.94	\$ 0.70	\$ 2.36	\$ 1.75	\$ (1.05)	100%	0.79	6.71	\$ 0.94	\$ 0.70

Total	\$	(12.07)	Total	\$	7.92
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## Notes and Sources:

1 100% compliance because the regulations will take effect in year 1.

2 Since year 1 represents 2013, and assuming a 10% growth rate based on a conservative estimate of Energy Star's market penetration growth, compliance in 2013 will assume a 40% increase in compliance from 2009, plus an additional 10% per year.  
[http://www.energystar.gov/index.cfm?c=partners.unit\\_shipment\\_data\\_archives](http://www.energystar.gov/index.cfm?c=partners.unit_shipment_data_archives)



## Handheld Barcode Scanners

Market Segment	Product	Design Life (Years)	Compliance	Unit Cost of Regulation (\$)	Unit Energy Savings (Kwh/yr)	First Year Unit Energy Savings (\$)	Stock 2009 (million)	Sales 2009 (million)	CAGR Sales 2010	CAGR Sales 2013	Sales 2010 (million)	Sales 2013 (million)	Stock 2013 (million)
Small Charger	Handheld Barcode Scanners	8.0	50%	\$0.50	19.67	\$2.75	0.26	0.02	6%	7%	0.02	0.03	0.32

\*These figures come from the CEC Report. See Appendices A-1 - A-7

Discount Rate	3%
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Net Savings Assuming Regulation												Net Savings Assuming No Regulation				
Year	Unit Energy Savings (Kwh/yr)	Stock Beginning of Year - 2013 (million)	Turnover	Compliance of New Sales <sup>1</sup>	Compliant Turnover Sales (million)	Energy Savings (Gwh/yr)	Energy Savings (\$M)	Present Value of Savings (\$M)	Costs (\$M)	Present Value of Costs (\$M)	Net Savings With Regulations (\$M)	Compliance of New Sales <sup>2</sup>	Compliant Turnover Sales (million)	Energy Savings (Gwh/yr)	Energy Savings (\$M)	Present Value of Savings (\$M)
a	b	c	d	e	f	g	h	i	j	k	l	m	n	o	p	q
			= 1 / Design Life	= 100%	= c * d * e	= b * f	= g * \$0.14	= h / (1.03)^a	= f * Unit Cost of Regulation	= j / (1.03)^a	= i - k	= Compliance + 4(10%) + 10% * (a - 1)	= c * d * m	= b * n	= o * \$0.14	= p / (1.03)^a
1	19.67	0.32	13%	100%	0.04	0.79	\$ 0.11	\$ 0.11	\$ 0.02	\$ 0.02	\$ 0.09	90%	0.04	0.71	\$ 0.10	\$ 0.10
2	19.67	0.32	13%	100%	0.04	0.79	\$ 0.11	\$ 0.10	\$ 0.02	\$ 0.02	\$ 0.08	100%	0.04	0.79	\$ 0.11	\$ 0.10
3	19.67	0.32	13%	100%	0.04	0.79	\$ 0.11	\$ 0.10	\$ 0.02	\$ 0.02	\$ 0.08	100%	0.04	0.79	\$ 0.11	\$ 0.10
4	19.67	0.32	13%	100%	0.04	0.79	\$ 0.11	\$ 0.10	\$ 0.02	\$ 0.02	\$ 0.08	100%	0.04	0.79	\$ 0.11	\$ 0.10
5	19.67	0.32	13%	100%	0.04	0.79	\$ 0.11	\$ 0.10	\$ 0.02	\$ 0.02	\$ 0.08	100%	0.04	0.79	\$ 0.11	\$ 0.10
6	19.67	0.32	13%	100%	0.04	0.79	\$ 0.11	\$ 0.09	\$ 0.02	\$ 0.02	\$ 0.08	100%	0.04	0.79	\$ 0.11	\$ 0.09
7	19.67	0.32	13%	100%	0.04	0.79	\$ 0.11	\$ 0.09	\$ 0.02	\$ 0.02	\$ 0.07	100%	0.04	0.79	\$ 0.11	\$ 0.09
8	19.67	0.32	13%	100%	0.04	0.79	\$ 0.11	\$ 0.09	\$ 0.02	\$ 0.02	\$ 0.07	100%	0.04	0.79	\$ 0.11	\$ 0.09

Total	\$	0.63	Total	\$	0.76
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## Notes and Sources:

- 1 100% compliance because the regulations will take effect in year 1.
- 2 Since year 1 represents 2013, and assuming a 10% growth rate based on a conservative estimate of Energy Star's market penetration growth, compliance in 2013 will assume a 40% increase in compliance from 2009, plus an additional 10% per year.  
[http://www.energystar.gov/index.cfm?c=partners.unit\\_shipment\\_data\\_archives](http://www.energystar.gov/index.cfm?c=partners.unit_shipment_data_archives)

## Two-Way Radios

Market Segment	Product	Design Life (Years)	Compliance	Unit Cost of Regulation (\$)	Unit Energy Savings (Kwh/yr)	First Year Unit Energy Savings (\$)	Stock 2009 (million)	Sales 2009 (million)	CAGR Sales 2010	CAGR Sales 2013	Sales 2010 (million)	Sales 2013 (million)	Stock 2013 (million)
Small Charger	Two-Way Radios	8.0	50%	\$0.50	8.86	<b>\$1.24</b>	0.6	0.028	0%	0%	0.03	0.03	0.6

\*These figures come from the CEC Report. See Appendices A-1 - A-7

Discount Rate	3%
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Net Savings Assuming Regulation												Net Savings Assuming No Regulation				
Year	Unit Energy Savings (Kwh/yr)	Stock Beginning of Year - 2013 (million)	Turnover	Compliance of New Sales <sup>1</sup>	Compliant Turnover Sales (million)	Energy Savings (Gwh/yr)	Energy Savings (\$M)	Present Value of Savings (\$M)	Costs (\$M)	Present Value of Costs (\$M)	Net Savings With Regulations (\$M)	Compliance of New Sales <sup>2</sup>	Compliant Turnover Sales (million)	Energy Savings (Gwh/yr)	Energy Savings (\$M)	Present Value of Savings (\$M)
a	b	c	d = 1 / Design Life	e = 100%	f = c * d * e	g = b * f	h = g * \$0.14	i = h / (1.03)^a	j = f * Unit Cost of Regulation	k = j / (1.03)^a	l = i - k	m = Compliance + 4(10%) + 10% * (a - 1)	n = c * d * m	o = b * n	p = o * \$0.14	q = p / (1.03)^a
1	8.86	0.60	13%	100%	0.08	0.66	\$ 0.09	\$ 0.09	\$ 0.04	\$ 0.04	\$ 0.05	90%	0.07	0.60	\$ 0.08	\$ 0.08
2	8.86	0.60	13%	100%	0.08	0.66	\$ 0.09	\$ 0.09	\$ 0.04	\$ 0.04	\$ 0.05	100%	0.08	0.66	\$ 0.09	\$ 0.09
3	8.86	0.60	13%	100%	0.08	0.66	\$ 0.09	\$ 0.09	\$ 0.04	\$ 0.03	\$ 0.05	100%	0.08	0.66	\$ 0.09	\$ 0.09
4	8.86	0.60	13%	100%	0.08	0.66	\$ 0.09	\$ 0.08	\$ 0.04	\$ 0.03	\$ 0.05	100%	0.08	0.66	\$ 0.09	\$ 0.08
5	8.86	0.60	13%	100%	0.08	0.66	\$ 0.09	\$ 0.08	\$ 0.04	\$ 0.03	\$ 0.05	100%	0.08	0.66	\$ 0.09	\$ 0.08
6	8.86	0.60	13%	100%	0.08	0.66	\$ 0.09	\$ 0.08	\$ 0.04	\$ 0.03	\$ 0.05	100%	0.08	0.66	\$ 0.09	\$ 0.08
7	8.86	0.60	13%	100%	0.08	0.66	\$ 0.09	\$ 0.08	\$ 0.04	\$ 0.03	\$ 0.05	100%	0.08	0.66	\$ 0.09	\$ 0.08
8	8.86	0.60	13%	100%	0.08	0.66	\$ 0.09	\$ 0.07	\$ 0.04	\$ 0.03	\$ 0.04	100%	0.08	0.66	\$ 0.09	\$ 0.07

<b>Total</b>	<b>\$</b>	<b>0.39</b>	<b>Total</b>	<b>\$</b>	<b>0.64</b>
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## Notes and Sources:

- 1 100% compliance because the regulations will take effect in year 1.
- 2 Since year 1 represents 2013, and assuming a 10% growth rate based on a conservative estimate of Energy Star's market penetration growth, compliance in 2013 will assume a 40% increase in compliance from 2009, plus an additional 10% per year.  
[http://www.energystar.gov/index.cfm?c=partners.unit\\_shipment\\_data\\_archives](http://www.energystar.gov/index.cfm?c=partners.unit_shipment_data_archives)

## Single Phase Lift-Trucks

Market Segment	Product	Design Life (Years)	Compliance	Unit Cost of Regulation (\$)	Unit Energy Savings (Kwh/yr)	First Year Unit Energy Savings (\$)	Stock 2009 (million)	Sales 2009 (million)	CAGR Sales 2010	CAGR Sales 2013	Sales 2010 (million)	Sales 2013 (million)	Stock 2013 (million)
Large Charger	Single Phase Lift-Trucks	15.0	0%	\$200.00	1,032.47	<b>\$144.55</b>	0.029	0.002	7%	1%	0	0	0.0298

\*These figures come from the CEC Report. See Appendices A-1 - A-7

Discount Rate	3%
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Net Savings Assuming Regulation												Net Savings Assuming No Regulation				
Year	Unit Energy Savings (Kwh/yr)	Stock Beginning of Year - 2013 (million)	Turnover	Compliance of New Sales <sup>1</sup>	Compliant Turnover Sales (million)	Energy Savings (Gwh/yr)	Energy Savings (\$M)	Present Value of Savings (\$M)	Costs (\$M)	Present Value of Costs (\$M)	Net Savings With Regulations (\$M)	Compliance of New Sales <sup>2</sup>	Compliant Turnover Sales (million)	Energy Savings (Gwh/yr)	Energy Savings (\$M)	Present Value of Savings (\$M)
a	b	c	d = 1 / Design Life	e = 100%	f = c * d * e	g = b * f	h = g * \$0.14	i = h / (1.03)^a	j = f * Unit Cost of Regulation	k = j / (1.03)^a	l = i * k	m = Compliance + 4(10%) + 10% * (a - 1)	n = c * d * m	o = b * n	p = o * \$0.14	q = p / (1.03)^a
1	1,032.47	0.03	7%	100%	0.00	2.05	\$ 0.29	\$ 0.28	\$ 0.40	\$ 0.39	\$ (0.11)	40%	0.00	0.82	\$ 0.11	\$ 0.11
2	1,032.47	0.03	7%	100%	0.00	2.05	\$ 0.29	\$ 0.27	\$ 0.40	\$ 0.37	\$ (0.10)	50%	0.00	1.03	\$ 0.14	\$ 0.14
3	1,032.47	0.03	7%	100%	0.00	2.05	\$ 0.29	\$ 0.26	\$ 0.40	\$ 0.36	\$ (0.10)	60%	0.00	1.23	\$ 0.17	\$ 0.16
4	1,032.47	0.03	7%	100%	0.00	2.05	\$ 0.29	\$ 0.26	\$ 0.40	\$ 0.35	\$ (0.10)	70%	0.00	1.44	\$ 0.20	\$ 0.18
5	1,032.47	0.03	7%	100%	0.00	2.05	\$ 0.29	\$ 0.25	\$ 0.40	\$ 0.34	\$ (0.10)	80%	0.00	1.64	\$ 0.23	\$ 0.20
6	1,032.47	0.03	7%	100%	0.00	2.05	\$ 0.29	\$ 0.24	\$ 0.40	\$ 0.33	\$ (0.09)	90%	0.00	1.85	\$ 0.26	\$ 0.22
7	1,032.47	0.03	7%	100%	0.00	2.05	\$ 0.29	\$ 0.23	\$ 0.40	\$ 0.32	\$ (0.09)	100%	0.00	2.05	\$ 0.29	\$ 0.23
8	1,032.47	0.03	7%	100%	0.00	2.05	\$ 0.29	\$ 0.23	\$ 0.40	\$ 0.31	\$ (0.09)	100%	0.00	2.05	\$ 0.29	\$ 0.23
9	1,032.47	0.03	7%	100%	0.00	2.05	\$ 0.29	\$ 0.22	\$ 0.40	\$ 0.30	\$ (0.08)	100%	0.00	2.05	\$ 0.29	\$ 0.22
10	1,032.47	0.03	7%	100%	0.00	2.05	\$ 0.29	\$ 0.21	\$ 0.40	\$ 0.30	\$ (0.08)	100%	0.00	2.05	\$ 0.29	\$ 0.21
11	1,032.47	0.03	7%	100%	0.00	2.05	\$ 0.29	\$ 0.21	\$ 0.40	\$ 0.29	\$ (0.08)	100%	0.00	2.05	\$ 0.29	\$ 0.21
12	1,032.47	0.03	7%	100%	0.00	2.05	\$ 0.29	\$ 0.20	\$ 0.40	\$ 0.28	\$ (0.08)	100%	0.00	2.05	\$ 0.29	\$ 0.20
13	1,032.47	0.03	7%	100%	0.00	2.05	\$ 0.29	\$ 0.20	\$ 0.40	\$ 0.27	\$ (0.08)	100%	0.00	2.05	\$ 0.29	\$ 0.20
14	1,032.47	0.03	7%	100%	0.00	2.05	\$ 0.29	\$ 0.19	\$ 0.40	\$ 0.26	\$ (0.07)	100%	0.00	2.05	\$ 0.29	\$ 0.19
15	1,032.47	0.03	7%	100%	0.00	2.05	\$ 0.29	\$ 0.18	\$ 0.40	\$ 0.26	\$ (0.07)	100%	0.00	2.05	\$ 0.29	\$ 0.18

<b>Total</b>	<b>\$</b>	<b>(1.32)</b>	<b>Total</b>	<b>\$</b>	<b>2.87</b>
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## Notes and Sources:

- 1 100% compliance because the regulations will take effect in year 1.
- 2 Since year 1 represents 2013, and assuming a 10% growth rate based on a conservative estimate of Energy Star's market penetration growth, compliance in 2013 will assume a 40% increase in compliance from 2009, plus an additional 10% per year.  
[http://www.energystar.gov/index.cfm?c=partners.unit\\_shipment\\_data\\_archives](http://www.energystar.gov/index.cfm?c=partners.unit_shipment_data_archives)

## Three Phase Lift-Trucks

Market Segment	Product	Design Life (Years)	Compliance	Unit Cost of Regulation (\$)	Unit Energy Savings (Kwh/yr)	First Year Unit Energy Savings (\$)	Stock 2009 (million)	Sales 2009 (million)	CAGR Sales 2010	CAGR Sales 2013	Sales 2010 (million)	Sales 2013 (million)	Stock 2013 (million)
Large Charger	Three Phase Lift-Trucks	15.0	0%	\$400.00	4,198.48	<b>\$587.79</b>	0.074	0.005	7%	1%	0.01	0.01	0.0754

\*These figures come from the CEC Report. See Appendices A-1 - A-7

Discount Rate	3%
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Net Savings Assuming Regulation												Net Savings Assuming No Regulation				
Year	Unit Energy Savings (Kwh/yr)	Stock Beginning of Year - 2013 (million)	Turnover	Compliance of New Sales <sup>1</sup>	Compliant Turnover Sales (million)	Energy Savings (Gwh/yr)	Energy Savings (\$M)	Present Value of Savings (\$M)	Costs (\$M)	Present Value of Costs (\$M)	Net Savings With Regulations (\$M)	Compliance of New Sales <sup>2</sup>	Compliant Turnover Sales (million)	Energy Savings (Gwh/yr)	Energy Savings (\$M)	Present Value of Savings (\$M)
a	b	c	d = 1 / Design Life	e = 100%	f = c * d * e	g = b * f	h = g * \$0.14	i = h / (1.03)^a	j = f * Unit Cost of Regulation	k = j / (1.03)^a	l = i * k	m = Compliance + 4(10%) + 10% * (a - 1)	n = c * d * m	o = b * n	p = o * \$0.14	q = p / (1.03)^a
1	4,198.48	0.08	7%	100%	0.01	21.10	\$ 2.95	\$ 2.87	\$ 2.01	\$ 1.95	\$ 0.92	40%	0.00	8.44	\$ 1.18	\$ 1.15
2	4,198.48	0.08	7%	100%	0.01	21.10	\$ 2.95	\$ 2.79	\$ 2.01	\$ 1.90	\$ 0.89	50%	0.00	10.55	\$ 1.48	\$ 1.39
3	4,198.48	0.08	7%	100%	0.01	21.10	\$ 2.95	\$ 2.70	\$ 2.01	\$ 1.84	\$ 0.86	60%	0.00	12.66	\$ 1.77	\$ 1.62
4	4,198.48	0.08	7%	100%	0.01	21.10	\$ 2.95	\$ 2.63	\$ 2.01	\$ 1.79	\$ 0.84	70%	0.00	14.77	\$ 2.07	\$ 1.84
5	4,198.48	0.08	7%	100%	0.01	21.10	\$ 2.95	\$ 2.55	\$ 2.01	\$ 1.73	\$ 0.81	80%	0.00	16.88	\$ 2.36	\$ 2.04
6	4,198.48	0.08	7%	100%	0.01	21.10	\$ 2.95	\$ 2.47	\$ 2.01	\$ 1.68	\$ 0.79	90%	0.00	18.99	\$ 2.66	\$ 2.23
7	4,198.48	0.08	7%	100%	0.01	21.10	\$ 2.95	\$ 2.40	\$ 2.01	\$ 1.63	\$ 0.77	100%	0.01	21.10	\$ 2.95	\$ 2.40
8	4,198.48	0.08	7%	100%	0.01	21.10	\$ 2.95	\$ 2.33	\$ 2.01	\$ 1.59	\$ 0.75	100%	0.01	21.10	\$ 2.95	\$ 2.33
9	4,198.48	0.08	7%	100%	0.01	21.10	\$ 2.95	\$ 2.26	\$ 2.01	\$ 1.54	\$ 0.72	100%	0.01	21.10	\$ 2.95	\$ 2.26
10	4,198.48	0.08	7%	100%	0.01	21.10	\$ 2.95	\$ 2.20	\$ 2.01	\$ 1.50	\$ 0.70	100%	0.01	21.10	\$ 2.95	\$ 2.20
11	4,198.48	0.08	7%	100%	0.01	21.10	\$ 2.95	\$ 2.13	\$ 2.01	\$ 1.45	\$ 0.68	100%	0.01	21.10	\$ 2.95	\$ 2.13
12	4,198.48	0.08	7%	100%	0.01	21.10	\$ 2.95	\$ 2.07	\$ 2.01	\$ 1.41	\$ 0.66	100%	0.01	21.10	\$ 2.95	\$ 2.07
13	4,198.48	0.08	7%	100%	0.01	21.10	\$ 2.95	\$ 2.01	\$ 2.01	\$ 1.37	\$ 0.64	100%	0.01	21.10	\$ 2.95	\$ 2.01
14	4,198.48	0.08	7%	100%	0.01	21.10	\$ 2.95	\$ 1.95	\$ 2.01	\$ 1.33	\$ 0.62	100%	0.01	21.10	\$ 2.95	\$ 1.95
15	4,198.48	0.08	7%	100%	0.01	21.10	\$ 2.95	\$ 1.90	\$ 2.01	\$ 1.29	\$ 0.61	100%	0.01	21.10	\$ 2.95	\$ 1.90

<b>Total</b>	<b>\$</b>	<b>11.27</b>	<b>Total</b>	<b>\$</b>	<b>29.53</b>
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## Notes and Sources:

- 1 100% compliance because the regulations will take effect in year 1.
- 2 Since year 1 represents 2013, and assuming a 10% growth rate based on a conservative estimate of Energy Star's market penetration growth, compliance in 2013 will assume a 40% increase in compliance from 2009, plus an additional 10% per year.  
[http://www.energystar.gov/index.cfm?c=partners.unit\\_shipment\\_data\\_archives](http://www.energystar.gov/index.cfm?c=partners.unit_shipment_data_archives)