Economic and Financial Aspects of Sustainability

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ABSTRACT

Despite all of the vanishing glaciers and fears of oil output peaking, or water becoming scarce, the public at large, and certainly investors and governments alike, will continue to "default" to the fact that fossil fuels are the cheapest way to "feed" and grow the local economy and the world economy. Our reality, therefore, is the very human decision to "talk green but go for first cost." It is a behavior that the "Sustainability Professional" will continue to be burdened with.

As the energy business evolves, then, how best can the "Sustainability Professional" accomplish day-to-day goals while meeting daily corporate demands with limited budgets? In simple terms, economics are still economics and the bottom line remains the bottom line.

This paper presents:

1. a solid appreciation for "the numbers;" and
2. a reasonable understanding (and simplification) of the Life Cycle Costing methods and resources.

The paper will provide this information in a way that the "Sustainability Professional" can visualize and embrace (i.e. as opposed to shying away from). This information, complimented by staying current on the ever increasing price of maintenance and energy as well as the new "values" being assigned to waste, water, emissions, and "carbon." Transportation and materials will provide the Sustainability Professional with a valuable basis for using economics to help (not hinder) his or her "green" projects.

Introduction

Carbon!? Until only a few years ago the mention of carbon, greenhouse gasses, or "cap and trade" had rarely ever appeared in any energy report, analysis or recommendation; or in any corporate brochure or program. Yet now, TODAY, the words greenhouse gas, "sustainability" and "green technology" appear on the front page of every paper. These or related words, are also found in the stimulus package, on Wall Street, and coming from the mouth of every politician (president, senator, governor, mayor, school board member). And it's often a part of the lead story on the evening news. As a result, there is a rapidly evolving need for a Sustainability Professional who understand and deploys the concepts, the metrics, the standards, the technologies and, especially, the financial justification for the corporate (or institutional) "green" program, sustainability plan and ultimately some "shovel ready" sustainability projects.

It is for this reason that, after providing background and perspective, this paper will present a dynamic, life cycle cost model which will highlight variables and sensitivities associated with leveraging the "green" advantage. Truly, now IS the time. With billions of dollars flowing to stimulating an economy that is green, there is no better time than now for energy efficient solutions to create the foundation for corporate investment[1].

Despite all of the vanishing glaciers, fears of oil price peaks, and water scarcity, the public at large, and certainly investors and government programs, will be tempted to "default" to the fact that fossil fuels are the fastest and cheapest way to "feed" and grow the local, national and the world economy. An initial reality, therefore, is the very human decision to "talk green but go for first cost." It is a behavior that the "Sustainability Professional" will continue to be burdened with unless (s)he is armed with the financial acumen and tools to articulate and quantify the financial aspects of a green program or project. In simple terms, economics are still economics and the bottom line remains the bottom line.

To employ convention financial tools to move energy efficiency projects (and renewable projects) to the corporate bottom line requires an understanding of:

1. the basics of "green" contrasted with conventional project financial tools
2. the ambiguities of "green" projects
3. qualitative and quantitative financial variables associated with green projects
4. the current practice of decoupling of "green" from making money.

Employing the above with a reasonable understanding of (and even simplification of) Life Cycle costing methods and resources, will result in the ability to deliver the most effective energy efficiency projects in the least amount of time and with a credible financial argument.

Financial Basics and Basics of Efficiency (and Green) Projects

Few "green" technologies are simple. In fact, because of their relative infancy and large capital requirements, most green technologies are not for the feint of heart. At the same time, stimulus money, expanded utility incentives, carbon credits, green tags and white tags, can significantly affect project value; and can radically affect the life cycle costs of any EEP (energy efficiency project). Therefore employing standard financial tools to energy efficiency projects (with their related incentives and other secondary benefits) can quickly move a green project to the front of the funding line.

This paper is not meant to provide a primer on corporate financial tools and practices. However, Figure 1 is provided in order that the basic principles of Net Present Value, Internal Rate of Return, and Return on Investment may be revisited[2]. It is these tools (and terms) that can and must be used to articulate and justify energy efficiency projects and green projects.

Past practices for energy efficiency projects have relied on the basic concept of payback (capital cost divided by savings). Generally speaking, a project with a payback of 3 years or less could be "sold" to financial decision makers and therefore constructed. More recently, institutional and utility financial criteria have allowed paybacks as high as 10 years, or greater.

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[1] In sticking with the theme of this Conference: timing IS everything. Moving investment decision to Energy Efficient Solutions.

[2] The presenter will provide an active overview showing that Microsoft Excel now handles these calculations almost without effort. Therefore once concepts are understood, analysis is easy.

Figure 1

ROI/ROR

	Invest	Year 1	2	Cumulative
Investment	-$100	-$50		*-$150*
Sale			$250	*$250*
			Return on Investment	*$100*
			Rate of Return	*67%*
			Annual Return	*33%*

IRR

	Invest	1	2
	($100)	($50)	$250
IRR	*35%*		

NPV

	Invest	Year 1	2	Discount Rate
Investment	-$100	-$50		5%
Sale			$250	
NPV	-$100			
yr 1	-$48			
yr 2	$227			
NPV	$79	compare to	*27%*	

IRR Example: Longer Term Investment

YEAR	Net Income	Cumulative	IRR after yr	NPVsvgs
0	-$70,000	*-$70,000*		$122,585
1	$20,000	*-$50,000*		
2	$20,000	*-$30,000*		
3	$20,000	*-$10,000*	-7%	
4	$15,000	*$5,000*	3%	
5	$15,000	*$20,000*	10%	
6	$29,000	*$49,000*	17%	
7	$31,500	*$80,500*	22%	
	$150,500			

Rate of Return (ROR) and ROI (**Return on investment**) are pretty much the same thing, except that ROI could also refer to the absolute $ of the return on investment. For example, if you invest $100 one year in a stock, and then $50 the following year, and you sell the entire lot for $250 the year after that, you can say the return on investment is $100 on the entire investment, instead of a Rate, i.e. percentage.

The **internal rate of return** is the interest rate received for an investment consisting of payments (negative values) and income (positive values) that occur at regular periods. These cash flows do not have to be even, as they would be for an annuity. However, the cash flows must occur at regular intervals, such as monthly or annually

The **Net Present Value** is the future stream of benefits and costs converted into equivalent values today. This is done by assigning monetary values to benefits and costs, discounting future benefits and costs using an appropriate discount rate, and subtracting the sum total of discounted costs from the sum total of discounted benefits.

Concepts:

1 Know: RoR, RoI, IRR and NPV
2 excel makes all of these EASY
3 You must visualize what it means

Given the above payback criteria, a recent energy efficiency project[3] that has been adopted at the highest corporate and institution levels defies historic financial practices. As evidenced by Table 1, solar electric (PV) systems have been shown to payback[4] in 20 years **or more** (not lower, but greater[5] than 20 years). Yet solar systems are embraced and promoted as key elements of many corporate "green" programs.

Financial analysis of solar electric (PV) systems can be made using conventional tools. However, prior to a rigorous analysis, it's important to identify a number ambiguities associated with "green" projects. These will help pave the way for a credible and realistic analysis.

Table 1

Recent Solar System Cost Feb-*09; payback = 39.2*				*$/Kw (rebate)*
236.38	kW (AC-CEC)	5%	*$2,278*	*$1,851*
Cost	*$1,499,000*	NPV (incentive)=	$538,374	$437,429
Cost/kW	*$6,341*	*cost per kW with structural, architectural, electrical*		
$/kW (w. rebate)	*$4,064*	$1,500,000	$12,687	$10,410
$/kWh (20year)	*$0.200*	Capital Cost	w/o incentive	w. incentive
kWh (20yr rebate)	*$0.128*		*1,660*	*kWh/installed kW*
1	REBATE CALCULATION		$0.32	$0.26
	kWh saved	Degradation	step 5	step 6
year 1	392,310	1	$125,539	$102,001
year 2	390,348	0.5%	$124,912	$101,491
year 3	388,397	0.5%	$124,287	$100,983
year 4	386,455	0.5%	$123,666	$100,478
year 5	384,522	0.5%	$123,047	$99,976
5 year Total	1,942,032	kWh saved	$621,450	

Incentive Rate	5 year Elec-Saved	5 year saved	Mothly Elec-saved	Monthly Payment
$/kWh	kWh	$	kWh	$/Month
$ 0.32	1,942,032	621,450	32,367	$ 10,357.51
$ 0.26	1,942,032	504,928	32,367	$ 8,415.47

The Ambiguities of Green

Prior to observing a quantifiable financial example, it is important to consider green *ambiguities.* There is a groundswell of desirability to be "green": green lifestyles, green corporations, green institutions, green collar jobs. The basic ambiguity is that a "green image" can be achieved, even though there can be concurrent demands for energy or products that consume substantial natural resources, including but not limited to, energy. For example, an organically grown cotton shirt may be worn by an individual or distributed by a "green corporate" program without recognizing that it may be costly to produce (i.e. relative to

[3] Energy Efficiency Projects and Renewable Energy Projects are related relative to utility incentive programs and procedures.
[4] In the example shown, with actual costs from lowest bid received in February 2009, the payback is 39 years!
[5] Some tax advantages can bring PV below 20 year payback.

imbedded demands for water[6], dyes and even transportation associated with project manufacture and transport to market.

The ambiguity relates to the perception and/or image associated with "green" organic, vs. the reality of the true "carbon footprint[7]" (i.e. "footprint and/or expense associated with scarce water[8], expensive shipping and potentially hazardous and expensive dyes). Since affluent customers are willing to pay for "green", this ambiguity is often disguised or ignored.

Another ambiguity can be associated with "green" being placed in conflict with inconsistent desires or appetites. For example, many college students believe themselves to be very "green". However, those same students are equally insistent on appliances that create a "cake and eat it too" dilemma (see Figure 2). Figure 2, indicates the new reality of student residence halls. The "typical" dorm room (residence hall room) currently uses 15 or more electric appliances. In comparison a dorm room in the 70's or 80's had only a hot plate or clock radio; (with perhaps a microwave oven being added in the 90's). In those days the standard dorm may have been designed for 5 to 10 amps per room. Today's dorm rooms require 20; or even 30 amps.

Ambiguities also relate to technologies themselves. Figure 3 indicates that automobiles powered by fuel cells, while "all the rage" just last year, are proving to be another generation away. Figure 3 also indicates recent life cycle discoveries that the U.S. focus on ethanol may also have embedded costs which result in a financial burden, as opposed to a financial boom.

A very interesting and quantifiable ambiguity comes in the form of the "free solar systems" which many institutions are installing under a financial instrument referred to as a power purchase agreement (PPA). Although potentially attractive, the "small print" in the agreements can have a great impact on the true financial burden that the "free" PV system places on an otherwise financially strapped institution. Figure 4 provides an example of how an aggressively negotiated PPA can result in true savings for an institution; vs. a poorly negotiated PPA; which can result in a significant long-term financial burden (unprofitability in the name of "green"). In the case of Figure 4, a comparison is made using key variables[9] which are standard to a PPA. A summary table below (Table 2) provides the input variables and the specific net present value associated with each assumption. As provided, the table indicates that in all cases the Board pays significantly MORE for energy over the life of the PV system (and this assume that the PV system really WILL have a 20 year life).

Table 2

Situation	$/kwh	$/kWh maintenance	Escalation	NPV (20yr) Power $$
Business as Usual	0.14	$0.00	4%	$960,000
PPA-1	0.15	$0.02	2%	$980,000
PPA-2	0.15	$0.02	5%	$1,280,000
PPA-3	0.15	$0.02	7%	$1,530,000
Note: if Board negotiates REC ownership income potential increases by $100k+				

[6] 10,000 liters per shirt of water need to grow organic cotton required for one t-shirt. Some organic shirts require intercontinental shipping. Compare this to synthetic fibers made locally.

[7] Taking into account Scope 1, 2 and 3 considerations

[8] Not only is water getting more scarce, but there is significant pumping energy to deliver water, and significant energy associated with water-treatment-after-use associated with the manufacturing or dying of the shirts.

[9] These will be discussed in the presentation (i.e. as they appear in Table 2)

Quantifying Secondary Benefits for use in Financial Justification

Given paybacks of 20 years or even greater, there is much to be learned from justification of the solar PV system. Understanding these benefits, within the framework of a life cycle costing model, aides in developing financial justification for ANY energy efficiency, renewable energy, or "green" project. Even though some of these benefits that are qualitative in nature, they can (and do) form a dominant part of a financial analysis. This is because reasonable assumptions can be made to quantify benefits. The following summary, therefore, provides qualitative and conventionally quantitative benefits:

1) Qualitative benefits:
   a. **Image**: Although intangible, significant investment is made by corporate marketing departments and HR departments. Because "green" is so fashionable and desirable, a solar system – with its high visual profile - can provide marketing and recruiting benefits which can be quantified. Note that except for PV or wind systems, most other energy efficiency projects have a low profile (i.e. most laypeople can neither see, nor understand an EEP. So, even though they hear to "make efficiency improvements first", energy efficiency is just not fashionable). This may be THE most significant reason why PV systems, with their verifiably long paybacks, are being justified.
   b. **Behavior**: Although intangible in the past, recent studies are showing that the behavior within a corporation or institution can have a 5%+ impact on energy use. It is for this reason, that solar or wind systems, with their high profiles, or energy efficiency projects and LEED projects (when savings are converted to greenhouse gas reduction equivalent; or which result in better daylighting or a more pleasant indoor environment) can be responsible for significant quantifiable savings on the order of 5% of total usage. Given a typical energy cost of $2.50 per square foot, a hypothetical 400,000 square foot facility could achieve savings on the order of 5% ($50,000 per year).
   c. **Productivity**: Behavior and productivity are related. Many of the benefits of "green buildings" are that given better indoor air quality, daylighting, etc, there can be improvements in productivity. Given an average office space of even 250 sf per person, and an average salary of $50,000 per year, a productivity improvement of just 1%, if spread across the board, can have an impact on that same 400,000 sf building of over $1 per square foot (in this case, $500,000 per year).
   d. **Embedded Costs** (energy, water, transportation, emissions): Many of the true costs (or benefits) of a project have not been exposed in a qualitative manner. An excellent example of embedded costs (or savings) is provided in footnote #6. These costs will become significant as mandatory carbon monitoring becomes law[10].
2) Qualitative financial benefits:
   a. **Maintenance and "design life" considerations:** The most quantifiable secondary benefit (or in some cases, financial liability) is the maintenance

[10] In March of 2009, the EPA proposed the first mandatory national greenhouse gas reporting program.

associated with "business as usual" vs. an energy efficiency project. The simplest example is a lighting system. Incandescent lights must be replaced every 1000 hours (i.e. with associated labor to remove and replace as well as capital cost for the new bulbs); fluorescent lights use less energy but also last 4000 hours (1/4 of the labor). Most recently LED lighting is replacing fluorescent due to even better efficiencies and longer life (as much as 50,000 hours before burnout..

b. **Energy savings**: Of course, a well designed and thought out energy efficiency project results in energy savings. Saving 100,000 kWh, for instance would result in recurring savings of rate x savings. If the project is persistent, these savings accrue for the life of the project and avoid the escalated rate of the utility saved.

c. **Green tags, white tags, renewable energy credits, and carbon trading benefits**[11]: With any energy efficiency or renewable project, a new value is being given to energy saved (or generated) As of the date of issuance of this paper, the value of these greenhouse gas offsets (carbon trades) are based on a "voluntary cap and trade" or on utility "green tag[12]" payments. For that reason, the equivalent value of – of a kilowatt hour of savings is approximately $0.002 per kWh. So, for instance, if an energy efficiency project saved 100,000 kwh. The energy costs savings (avoided cost) at $0.10/kWh would be 100,000 * $0.10 = $10,000 per year. But, even with the current voluntary cap and trade system, a value of carbon offsets could be taken as $0.002 * 100,000 = $200. This may not sound like much. But times are changing. With mandatory cap-and-trade on the horizon, this value could easily be increased by a factor of 10. In a life cycle cost analysis, for instance, showing a significant escalation for the "carbon credits"(i.e. because of the likely "mandatory cap and trade" program being considered by Congress and the Obama administration right now) can radically affect the net present value of the project.

d. **Utility Incentives**: Of course, with every bit of energy saved, there are utility incentives of as much as $0.25 per kWh and $1.00 per therm. Although only first-year incentives they can greatly offset the initial (or <u>incremental</u>) cost of a project.

e. **Performance based energy incentives**: Many renewable systems incentives are now spread over time. Instead of the conventional, one-time utility incentive in the form of a capital incentive per installed kilowatt, new programs are requiring performance and reward it over time. Table 3 provides a 5-year of solar (PV) performance based incentives (for PV):

[11] Refer to paper 125 of this conference for specifics.
[12] "Buy green" programs are sourced to renewable energy credits and are usually utility specific.

Table 3.

Step	Statewide MW in Step	PBI Payments (per kWh)		
		Residential	Non-Residential	
			Commercial	Government/ Non-Profit
1	50	n/a	n/a	n/a
2	70	$0.39	$0.39	$0.50
3	100	$0.34	$0.34	$0.46
4	130	$0.26	$0.26	$0.37
5	160	$0.22	$0.22	$0.32
6	190	$0.15	$0.15	$0.26
7	215	$0.09	$0.09	$0.19
8	250	$0.05	$0.05	$0.15
9	285	$0.03	$0.03	$0.12
10	350	$0.03		

Advantage of as much as $0.12/kWh

Note that, in the Table 3 example, the non-profit incentives, paid over 5 years for every kilowatt generated, are considerably more lucrative than the same incentives for the same PV installation for a private entity. This approach has been taken[13] in order to make up for the loss of tax advantages.

The Sustainable Life Cycle Cost Model

The point of the presentation, after laying the above groundwork, is to present a dynamic, life cycle cost model which will highlight variables and sensitivities[14] associated with all of the above. These are provided as Figures 5, 6 and 7 as follows:

- Figure 5 indicates avoided costs associated with the solar system which was introduced in Table 1. This Figure shows that, even though solar systems have long payback, many non-profits are using Bond money to both modernize campuses and to displace future recurring costs. In this case, over $3million in Bond money was used to create avoided costs of as much as $200,000 per year for the life of the solar PV system.
- Figure 6 provides a life cycle costing model indicating net present value and IRR of a conventional efficiency[15] project. This project showed a 25 year payback, but had substantial maintenance, reliability and life-cycle benefits. These and the effect of conventional escalation, and "white tag" credits will be demonstrated in the presentation.
- Figure 7 provides cumulative cash flow comparisons between business as usual, vs. funding of the efficiency project introduced in Figure 6. Note that the true break point of the project is at just below 11 years.

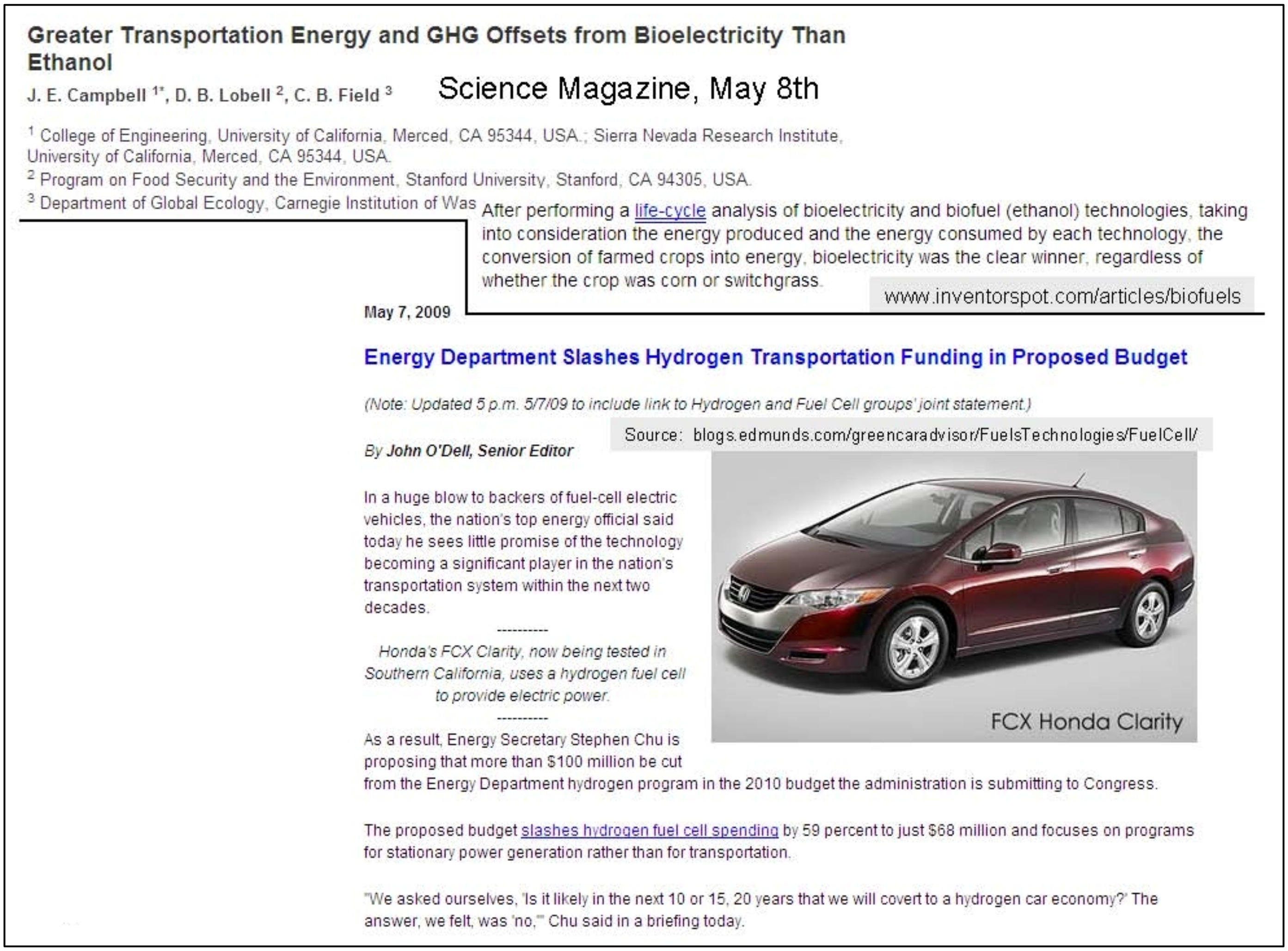
[13] California Solar Initiative
[14] The dynamic model is presented in the lecture. Changes are made to the variables, with instantaneous updates of NPV.
[15] This project replaces mid-life "boxcar" air cooled chiller systems with a high efficiency central cooling plant.

Making a Profit and Being Green

Particularly now that it is in fashion at the very highest corporate and political levels, “green” projects, even unprofitable ones, will be constructed. It is unfortunate that because a “green” image can be bought, many corporations and institutions have decoupled the “green image” from profitability.

However, because of the many primary and secondary benefits associated with energy efficiency and renewable energy projects, conventional business tools can predict true profitability of an energy efficiency (or renewable) project. Employing the concepts herein, our conventional financial tools can be used to differentiate between projects that provide only image, and projects that provide image AND profit.

Figure 3



Greater Transportation Energy and GHG Offsets from Bioelectricity Than Ethanol

J. E. Campbell [1*], D. B. Lobell [2], C. B. Field [3]

Science Magazine, May 8th

[1] College of Engineering, University of California, Merced, CA 95344, USA.; Sierra Nevada Research Institute, University of California, Merced, CA 95344, USA.
[2] Program on Food Security and the Environment, Stanford University, Stanford, CA 94305, USA.
[3] Department of Global Ecology, Carnegie Institution of Was

After performing a life-cycle analysis of bioelectricity and biofuel (ethanol) technologies, taking into consideration the energy produced and the energy consumed by each technology, the conversion of farmed crops into energy, bioelectricity was the clear winner, regardless of whether the crop was corn or switchgrass.

www.inventorspot.com/articles/biofuels

May 7, 2009

Energy Department Slashes Hydrogen Transportation Funding in Proposed Budget

(Note: Updated 5 p.m. 5/7/09 to include link to Hydrogen and Fuel Cell groups' joint statement.)

Source: blogs.edmunds.com/greencaradvisor/FuelsTechnologies/FuelCell/

By ***John O'Dell, Senior Editor***

In a huge blow to backers of fuel-cell electric vehicles, the nation's top energy official said today he sees little promise of the technology becoming a significant player in the nation's transportation system within the next two decades.

Honda's FCX Clarity, now being tested in Southern California, uses a hydrogen fuel cell to provide electric power.

As a result, Energy Secretary Stephen Chu is proposing that more than $100 million be cut from the Energy Department hydrogen program in the 2010 budget the administration is submitting to Congress.

The proposed budget slashes hydrogen fuel cell spending by 59 percent to just $68 million and focuses on programs for stationary power generation rather than for transportation.

"We asked ourselves, 'Is it likely in the next 10 or 15, 20 years that we will covert to a hydrogen car economy?' The answer, we felt, was 'no,'" Chu said in a briefing today.

Figure 4

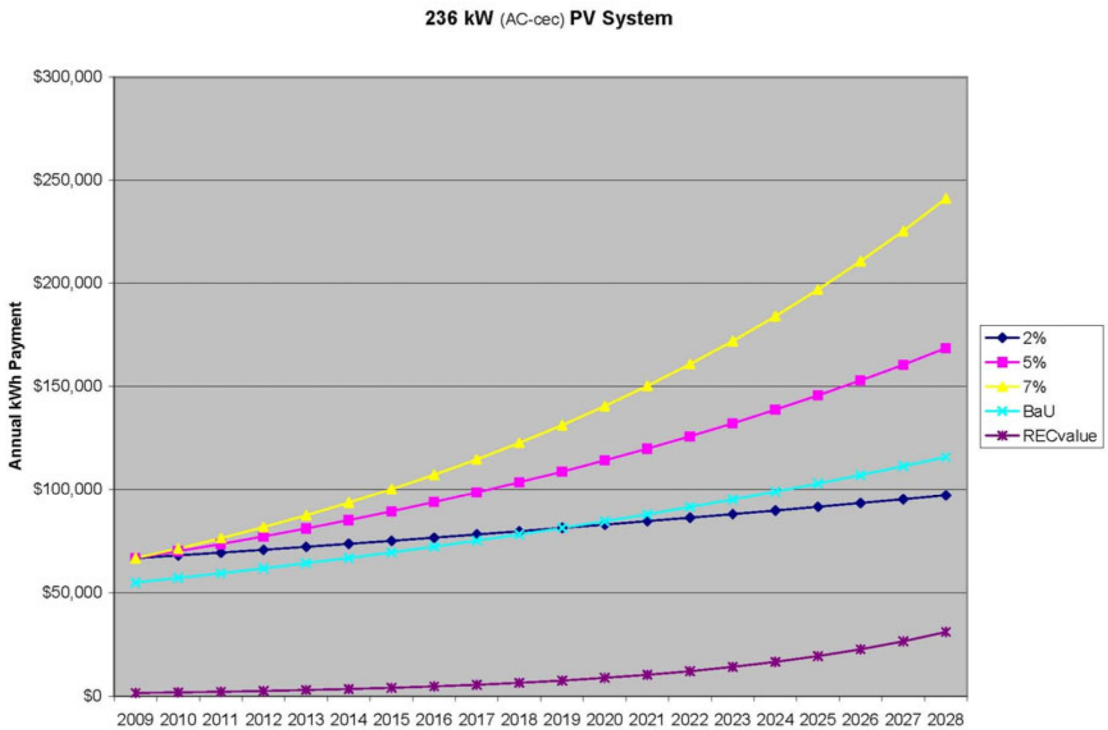


Figure 5

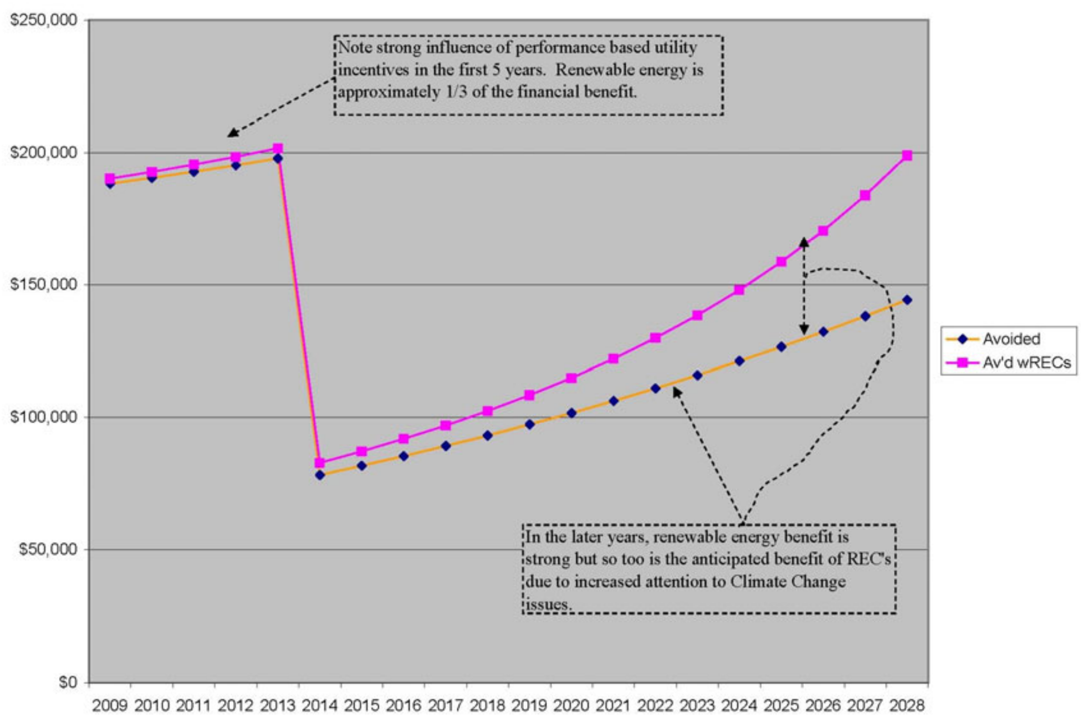


Figure 6

ENERGY PROJECT LIFE CYCLE COST EVALUATION

Replace package "boxcar" units with 1,200 ton central plant

Simple Payback		Savings		Rate	Total Year	Escalation
Invest	$4,570,849	2,101,725	kWh	$0.092	$193,359	6%
Annual Savings	$193,359	0	therms	$1.14	$0	3%
Payback	23.6 years	1,778,059	lbs GHG		$193,359	
Rate of Return	4%	0.846	lbs/kWh	Discount Rate:	5%	
		$0.00	per ton			

Cost of "best" plant = $5,363,840
differential $792,991

NPVsavings $6,983,367 NPV investment: -$2,412,518
Investment $4,570,849
NPV: $2,412,518

	BUSINESS AS USUAL (BaU)		1	1	REPLACE BOXCARS with CENTRAL PLANT				1	4%	BOXCAR REPLACEMENT NPV = $7,438,499		
5%	NPV= $9,866,557		3%	5%					$0.10	$0.0000	*NPV full*		
Year	kWh	Energy $	Replace	Maint'nce	kWh	Energy $	Replace	Maint'nce	Rebate	Ecredits	Present	Proposed	Savings
1	3,311,325	$304,642	$10,000	$5,200	1,209,600	$111,283	$0	$0	$210,173	$0	$319,842	($98,889)	$418,731
2	3,311,325	$322,920	$10,300	$5,460	1,209,600	$117,960	$0	$0	$0	$0	$338,680	$117,960	$220,720
3	3,311,325	$342,296	$10,609	$5,733	1,209,600	$125,038	$0	$0	$0	$0	$358,638	$125,038	$233,600
4	3,311,325	$362,833	$10,927	$6,020	1,209,600	$132,540	$0	$0	$0	$0	$379,780	$132,540	$247,240
5	3,311,325	$384,603	$11,255	$6,321	1,209,600	$140,492	$0	$0	$0	$0	$402,179	$140,492	$261,687
6	3,311,325	$407,680	$11,593	$6,637	1,209,600	$148,922	$0	$0	$0	$0	$425,909	$148,922	$276,987
7	3,311,325	$432,140	$11,941	$6,968	1,209,600	$157,857	$0	$0	$0	$0	$451,049	$157,857	$293,192
8	3,311,325	$458,069	$12,299	$7,317	1,209,600	$167,329	$0	$0	$0	$0	$477,684	$167,329	$310,356
9	3,311,325	$485,553	$12,668	$7,683	1,209,600	$177,369	$0	$0	$0	$0	$505,903	$177,369	$328,535
10	3,311,325	$514,686	$2,400,000	$8,067	1,209,600	$188,011	$150,000	$0	$0	$0	$2,922,753	$338,011	$2,584,742
11	3,311,325	$545,567		$8,470	1,209,600	$199,291	$0	$0	$0	$0	$554,037	$199,291	$354,746
12	3,311,325	$578,301		$8,894	1,209,600	$211,249	$0	$0	$0	$0	$587,195	$211,249	$375,946
13	3,311,325	$612,999		$9,338	1,209,600	$223,924	$0	$0	$0	$0	$622,338	$223,924	$398,414
14	3,311,325	$649,779		$9,805	1,209,600	$237,359	$0	$0	$0	$0	$659,585	$237,359	$422,226
15	3,311,325	$688,766		$10,296	1,209,600	$251,601	$0	$0	$0	$0	$699,062	$251,601	$447,461
16	3,311,325	$730,092		$10,810	1,209,600	$266,697	$0	$0	$0	$0	$740,902	$266,697	$474,206
17	3,311,325	$773,898		$11,351	1,209,600	$282,698	$0	$0	$0	$0	$785,249	$282,698	$502,550
18	3,311,325	$820,331		$11,918	1,209,600	$299,660	$0	$0	$0	$0	$832,250	$299,660	$532,590
19	3,311,325	$869,551		$12,514	1,209,600	$317,640	$0	$0	$0	$0	$882,066	$317,640	$564,426
20	3,311,325	$921,724	$13,071	$13,140	1,209,600	$336,698	$0	$0	$0	$0	$947,935	$336,698	$611,237
21	3,311,325	$977,028	$13,463	$13,797	1,209,600	$356,900	$0	$0	$0	$0	$1,004,288	$356,900	$647,388
22	3,311,325	$1,035,650	$13,867	$14,487	1,209,600	$378,314	$0	$0	$0	$0	$1,064,003	$378,314	$685,689
23	3,311,325	$1,097,788	$14,283	$15,211	1,209,600	$401,013	$0	$0	$0	$0	$1,127,283	$401,013	$726,270
24	3,311,325	$1,163,656	$14,711	$15,972	1,209,600	$425,074	$0	$0	$0	$0	$1,194,339	$425,074	$769,265
25	3,311,325	$1,233,475	$15,153	$16,771	1,209,600	$450,578	$0	$0	$0	$0	$1,265,398	$450,578	$814,820

Figure 7