SOLAR INDUSTRY INCENTIVE PROGRAMMES

(DOING THE RIGHT THING…
AND KNOWING WHAT RIGHT THING TO DO)

BY
LARRY D. KILLION*

MARCH 2017

Abstract

Solar energy has experienced phenomenal growth in recent years[1] due to both technological improvements resulting in cost reductions and government policies supportive of renewable energy development and utilization. While the cost of solar energy has declined rapidly in the recent past, it remains high compared to conventional (the historical established carbon economy fossil fuel non-renewable) energy technologies.

Like other renewables energy technologies, as well as non-renewables (namely the carbon-based oil and gas industry), solar energy benefits from fiscal and regulatory incentives, including tax credits and exemptions, feed-in-tariff, preferential interest rates, renewable portfolio standards and voluntary green power programs, in many countries. Noteworthy is that there are many other industries other than energy that benefit from fiscal and regulatory incentives.

The emerging carbon credit markets are expected to provide additional incentives to solar (and other renewable technologies such as wind) energy deployment; however, the scale of incentives provided by the existing carbon market instruments, such as, the Clean Development Mechanism of the Kyoto Protocol, is anticipated to be limited. Despite the huge technical potential, the development and large scale deployment of solar energy technologies world-wide still has to overcome a number of technical, financial, regulatory and institutional barriers. The continuation of policy supports might be necessary for some time to come to maintain and enhance the growth of solar energy in both developed and developing countries.

Are incentives good or bad? Do they distort the 'free market' enterprise system, or, are they a legitimate process for encouraging and advancing society's desired outcomes?

As in all pursuits, 'All Things In Moderation', so there is no convenient definitive all or nothing answer – another inconvenient fact.

This paper's objectives include focused insights into:

- The importance and necessity of incentives (in any industry);
- Summary of renewable (solar) energy incentives;
- For comparison, summary of oil and gas industry (non-renewable) incentives (even though some might argue are such incentives needed given the long history of the industry and publicly reported successful profitability, return on capital and earnings financial reports);

[1] *…"Renewable energy technologies are now a major global industry. Wind and solar PV have led recent growth in renewables-based capacity… Renewables have overtaken coal as the largest source of power generation capacity and are the second largest source of electricity supply. Renewables make a modest contribution to heat and transport and while progress is slower they have huge potential in their sectors….Renewables bring environmental, economic and energy security benefits….The competitiveness of renewable energy is rapidly evolving, with falling costs set against the broader energy system developments…."*, International Energy Agency, *World Energy Outlook 2016 (2016).*

- Detail calculations and formulas of how many incentives work – more than just understanding the principle, but also the math – often a mystery – as always, **the devil is in the detail**;
- A reference to use in discussions next time the theory of incentives…for any industry…is challenged as being against laissez-faire economic principles (an economic system in which transactions between private parties are free from government interference such as regulations, privileges, tariffs, and subsidies. The phrase laissez-faire is part of a larger French phrase and literally translates to "let (it/them) do", but usually means to "let go".)[2]

[2] * Author: Larry D. Killion; Registered Professional (Chemical) Engineer-Texas (Texas Tech University); Licensed Attorney at Law-Texas (South Texas College of Law); Executive MBA Graduate School of Business Administration (University of Southern California); Natural Gas Vehicle Conversion (Loughborough College of Technology, United Kingdom); Association of International Petroleum Negotiators Prior Board Member; Various senior/executive U.S. domestic and international positions as well as U.S. and foreign expatriate residency assignments: Atlantic Richfield Company (downstream refining/petrochemical operations), J.E. Sirrine Company (Design, Engineering, Construction Management, hydrocarbon and forest products, process/environmental engineering), Santa Fe Energy Company, Hamilton Brothers Oil Company; BHP Billiton Petroleum. (Upstream/Downstream engineering, operational, legal (litigation/transactional), marketing, commercial (extensive U.S. and international land title transactional and property rights practice); exposures in Energy and Forest Products Industries), Graduate: ImagineSolar PV201 Foundations of Solar PV System Design and Installation; ImagineSolar PV330: Advanced PV Project Experience; 360training OSHA 10 Hour Outreach Training Programme; 360training GHS and OSHA Hazardous Communication; OSHA 10 hour Occupational Safety and Health Training Course in Construction Safety and Health; Associate Member, North American Board of Certified Energy Practitioners (NABCEP); Author/Presenter of various U.S. and international technical and commercial papers (Author: *Water-Gas Electrolysis Gasoline Fuel Supplement – Fact Or Myth?,* ISBN 9781468138993); Houston, Texas; email at 11235ldk@comcast.net.

Introduction

Incentives are generally…

- promoted or supported by the entity or person providing the incentive;
- to promote or cause a certain behaviour;
- of those entities or persons targeted to implement the behaviour.

Incentives work whether it is a cookie incentive reward available to a child, or financial or reputation incentive award to a business – either promote a certain desired behaviour.

A good discussion on incentive theory and practice, by Mark Sweeney, is summarized as follows…

When discussing incentives, it is important to distinguish between location advantages, location assets and incentives.

The role of incentives in economic development generates a lot of discussion, with various parties arguing for and against their use by governments and their agencies. These discussions are often characterized by a noteworthy lack of understanding of what incentives are and how they work. In fact, there is often confusion around what constitutes an incentive as well as how they are designed and executed. There is a tendency in the debate to frame a narrow choice of either spending on assets or spending on incentives. In addition to the misunderstandings, there are perceived winners and losers with incentives. However, properly designed and executed, incentives are not part of a zero-sum game and by their nature are expected to create an increase in wealth for a specific area. That area can range from a hemisphere (trade agreements) to a neighbourhood (target enterprise zones).

*Why Incentives? Governments (**and private enterprise – bold type are L Killion's edits**) of all sizes, in all places, and over hundreds of years, have used incentives to promote economic activity for the purpose of increasing the wealth and quality of life of its citizens. It is important for incentive policy makers to start with the understanding that this is a tool to achieve those strategic community goals, and design them so that the public benefits of the incentive, outweigh the costs. It is generally accepted public policy that governments have a role in promoting and maintaining a sound economic structure. Most states have an explicit state Court ruling confirming that economic development is a legitimate role of government. Once that position is understood and accepted, then the debate comes to what should governments do in that regard. Most locations recognize that sustaining economic activity is a function of a large number of factors. One goal is to promote new investment and employment and in order to do this, policy makers must understand how investment location decisions are made. Once that is understood, then the means to influence those decisions becomes clear, and incentives are one tool to achieve that goal.*

What Is An Incentive? One challenge in discussing incentives is determining what an incentive is. It is important to make a distinction between location advantages, location assets and incentives. A useful definition for economic development incentives would be a deliberate policy or set of policies designed to make a location more attractive to particular investment decision makers. This definition distinguishes incentives as policy actions as opposed to inherent location advantages. It also distinguishes between location assets as a result of general public investment and actions to attract specific industries or

companies. For example, proximity to the Atlantic Coast is a potential location advantage, the Port of Baltimore is a location asset, and reduced port fees for a company in conjunction with a location or expansion in the area is an incentive.

*How And Why Do Incentives Work? In order to see why incentives are valuable, it is important to understand how they work — how they generate benefits, and how they influence locations. The ultimate goal of such policies is to increase the wealth of an area's citizens (**or investors**). For most incentives, benefits outweigh, often dwarf, the costs. This is due to the circulation of the new wealth that is attracted. This can be seen in increased investment and employment beyond that of the attracted activity. Multiplier effects will vary with activities and locations, but they are an important element in incentive policy. The U.S. automotive industry **(as well as other industries, for example, the oil and gas industry)** has one of the highest multipliers of any activity, and the effect of the auto plants of the past 20 years has dwarfed the stated value (an often-inflated value) of the incentives. This result holds even for the narrow view of government revenues — as if the government is an investment house looking for a profitable return — government revenues from such mega activities far exceed the government expenditures. Incentives are designed to influence location decisions.*

*First recognize that investment has a choice with regard to location (free flow of capital). This is truer than ever on a global scale, and was a fundamental part of the founding structure of **the United States**.*

Second, recognize that where you locate a facility has a significant effect on its success. Locations vary on a host of site variable factors and the decision-maker has to identify those differences and understand how they will affect them. Incentives are part of this complex scenario and dynamic decision process. They affect the strategic and operational aspects of the project, typically with an emphasis on direct cost reduction.

*Spending On Assets Vs. Spending On Incentives? One argument against incentives is that incentives are detrimental in that public resources should be focused on investing in location assets and not incentives. However, the line between incentives as benefits to a company versus investments as benefits to a community is blurring. The new emphasis on knowledge-worker activities has brought community and quality of life assets to the forefront of the incentive discussion. Considerable activity is likely to emerge in the development of quality of life assets in support of the attraction and development of knowledge worker firms. While most of these may not be direct grants to companies, they will likely share the characteristics of the more traditional infrastructure incentives such as a new **roadway** interchange for an auto assembly plant, which certainly benefits the company but is a community asset.*

The Either/Or Position There seems to be a long and consistent tendency to limit economic development focus and practice. This either /or approach is popular with politicians and pundits who are more interested in soundbite positioning as opposed to thoughtful, challenging policy decisions. This often occurs around elections with pronouncements about taking care of existing industry by rolling back incentives to new firms. More recently, it seems to have taken over the debate on incentives with the contention that governments should be investing in location assets and doing away with incentives. This either/or approach is commonly heard in recent discussions of the shift to a knowledge economy. Old recruitment policies are abruptly abandoned in the search for positioning for knowledge-worker opportunities. Such pursuits may turn out to be wise forward thinking, but there are immediate needs and opportunities to be addressed while making the transition to the knowledge worker world. There is no need to pit one approach against the other because the short-term transition of many locations will not allow for immediate needs to be ignored while long-term assets for knowledge economy opportunities are developed. For example, the rising ranks of unemployed workers need jobs now, not a generation from now when investments in higher education are realized. Governments

have always done both, investing in location assets while also developing incentives. In the context of overall fiscal policy, these two economic development needs need not be isolated into an either/or position. Rather, the developing shift to a knowledge-worker economy demands extraordinary policy efforts, including an increased spending on location assets.

Do both. The Fairness Assumption When all is said and done, most of the arguments against incentives focus on tax policies that provide tax breaks to investing and employing companies. The criticism of tax incentives frequently has as an unstated assumption that the tax structure without the incentives is somehow sound, fair and optimally designed, and that incentive policy upsets that finely designed balance and creates unfair advantages. This could not be further from the truth. Fundamental state tax policy (not even considering incentives) is the result of intense lobbying and political manoeuvring during many years and across virtually every interest group you can imagine — homeowners, renters, teachers, senior citizens, demographic minorities, small business, big business, agriculture, unions, truckers, railroads, environmentalists, etc. The end result of state income, sales and property tax policy is a code creating advantages for some, and disadvantages for others. The criticism of negotiated property tax agreements will often point to the cost of the program as something given up by the community and unfair to other tax payers. The first assumption in this argument is that the company would come without the incentive. It cannot be assumed a project would come without the property tax incentive, particularly if it is a high impact incentive mitigating a major weakness. The second assumption behind this argument is that the tax climate is fairer without the incentive. The property tax treatment in the community may rely primarily on taxing factories and be grossly "unfair" to manufacturers and advantageous to homeowners. This concern about incentives is an attempt to preserve a status quo that is not so much fair as it is advantageous to one group and disadvantageous to others. …The development of major tax incentives such as payment-in-lieu property tax programs arise from an attempt to mitigate a weakness (major cost penalty) in the recruitment of capital-intensive industries.

National Policy In the United States, the federal government sets many of the rules and boundaries for state policy and then states operate within those boundaries in ways that are best suited to their circumstances. An example is the federal Commerce Clause which provides limits on what states can do to affect interstate commerce. This structure does foster competition across states, but now competition typically includes non-U.S. locations as well, so the competitive position, and the role of incentives in enhancing that competitive position, is not just state vs. state, but state vs. another country. Increased federal restraint of state and local government incentive activity will be difficult at best. Where does the federal government draw the line? For instance, should they rule that there be no job creation credits? If so, winners will be already healthy areas with low unemployment, while losers will be struggling areas with many of its citizens unemployed. Should the federal government dictate property tax policy? Does that mean every class of property is treated the same in every location? Should manufacturing areas have the same property tax policies as tourism areas that have low property taxes and high sales taxes? The federal government fulfils its role as guardian of the overall boundaries, and did so … with the Cuno vs. DaimlerChrysler case in the 6th U.S. Circuit Court of Appeals. But it is important to note that while the ruling held an investment tax credit violated the Commerce Clause (… ***which the U.S. Supreme Court overturned citing Plaintiffs did not have standing, 537 U.S. 332 (2006))****.*

Mark Sweeney, senior principal for McCallum Sweeney Consulting, based in Greenville, S.C., Business Xpansion Journal (January 2006, http://www.bxjonline.com/bxj/article.asp?magarticle_id=919&mag_); msweeney@mccallumsweeney.com.

Solar Incentives

The nascent solar industry is here to stay. It is fundamental that there is no rationale argument against utilizing a 'free' and 'clean' energy fuel not subject to having to be explored for – only captured - (photon's from sunlight) generated by the largest nuclear fission power plant – the sun - in spaceship earth's solar system. It is physics that confirms that 180 times a day's worth of sunshine energy striking the earth, equates to a year of total energy consumed on spaceship earth. (Just think of all that other energy from the sun not striking the earth…since the sun irradiates its power in all directions around its globe – and earth's sphere of photon capture is minuscule in size.) Part of the challenge is that a gallon of sunshine falls short of having the same energy density or potential than a gallon of gasoline (even though that gallon of gasoline was for all practical purposes indirectly produced over millions of years by the aid of that nuclear fission machine, the sun) – thus gasoline is indirectly solar energy, just in another form, just like tidal power, wind power, and other renewables.

It is fundamental that non-renewable carbon based fossil fuel energy sources are finite…as it is doubtful humans can wait the millions of years it takes to produce more..so once consumed, is gone. Thus, promoting a good balance between non-renewable and renewable energy sources is a good thing…all things in moderation. And to provide incentives for promoting this moderation is also a good thing…whether the incentive is for non-renewable energy or renewable energy.

A catalogue of incentives available to the solar industry is presented in the below table and includes: a description of the incentive, the driver behind the incentive and a complementary comment.

A high-level summary table complements the incentive table, illustrating what ranked incentives might give the best 'bang for your buck'…and admittedly overly simplified analysis of which incentive might be preferred to promote the most aggressive behaviour. The ranking conclusions outlined in this table are highly dependent on the content and scope of the actual incentive, the nature of any particular project, the investor status (private, public, company, individual, tax status), timing, state of technology and costs, and a host of other conditions. Thus, the author readily accepts that the reader can view this table as having some ranking characterization insights…or the entire illustration is rank and flawed. The author pleads nolo contendere in either case…

Ranking Priority	Incentive Category	Incentive Ranking Rationale -Why 'Best Bang For The Buck'
1st	Access To Sunlight	Access to sunlight is fundamental and essential… NO SUN...NO FUN... without sunlight access all other incentives are meaningless since there is no solar project without sunlight access; Similar to the oil and gas industry… NO LEASE ... NO GREASE (access to land rights to potential oil and gas resource is essential)
2nd	Rebates, Grants, etc. (tax exempt)	Avoidance of up-front investment expense.
3rd	Tax credits and exemptions	Dollar for Dollar offset of tax obligations
4th	Tax deductions; Accelerated depreciation, Power Price incentives	Reduction of tax obligations; Incentive or guaranteed energy costs (or income if over produced power)
5th	Lease, Power Purchase Agreement, Public Benefit Funds, PACE Programs, Solar Renewable Energy Credits (tradeable)	Reduced up front investment costs; Attractive investment terms (loan amount, interest rate, payback terms)
6th	Energy Efficiency Policies; Renewal Portfolio Standards, Building Codes, Equipment Certification, Training	Indirect financial incentives that promote and faciliate renewable energy but not necessarily fundamental or essential for the industry to exist.

Incentives associated with the solar renewable energy resource industry.

Incentive Category	Description	Incentive Driver	Comment
Access	- Right To Light	- Legal access rights to sunlight during the solar window time period is essential.	- Right to light brings into the forefront fundamental property rights of land owners to do whatever they want with their property so long as it is consistent with established land use restriction laws and regulations and avoidance of violation of neighbour rights (such as nuisance conditions on a property such as objectionable odours or particulate matter generated on a property, being carried by the wind to adjacent land owners). A fair and equitable community land use balance is required. - Extremes will need to be avoided…such as a roof mounted one square foot area solar panel powering an on-site security light, being used as the basis for preventing adjacent land owners from building light obstruction structures.
Access	- Solar/Wind Access Policy	- Solar/Wind gov't promoted access policies can guide property owners on the optimum noncontroversial relationship between solar access neighbour with non-solar property neighbours.	
Access	- Interconnection	- Although PURPA(1) promotes interconnection (with interactive (2) solar power producers), the devil is in the detail in regard to fair and equitable interconnection policies and principles that do not unreasonably hinder solar power interconnection.	- A fair and equitable balance is needed between Utility and interactive solar power producers regarding interconnection, taking into account not only the distributed power producer (the home owner) interconnection needs, but also the Utility's justifiable assessment of reasonably managing grid power distribution circuits and power plant operations conditions. (Excessive grid connected power cycling due to aggressive and erratic interconnected distributed interactive solar power homeowner producers on and off the grid schedule…are legitimate power grid assessment concerns).
Access	- Line Extension Analysis	- Interconnection access could include a reasonable and	

Incentive Category	Description	Incentive Driver	Comment
		accurate line extension analysis to assist with understanding investment costs and benefits of an interactive solar system.	
Access	- Utility Green Power Option Mandates	- State policies may include the obligation for state regulated Utility companies to make available Green Power (solar, wind, etc.) service options for consumers.	
Financial	- Loans or Bonds	- Having available access to 'guaranteed' loan or bond funds with attractive payment schedules (and possibly even loan forgiveness options if certain conditions are met – such as achieving solar performance metrics; certain power generated size targets, etc.) along with competitive interest rates.	- Financial incentives vary among governments (city, county, state and federal jurisdictions) and private concerns (Utilities – private or public, contractors, financial institutions, etc.). A high level summary of various financial incentives are illustrated in below Table A. System discounts and rebates, attractive financial loans, leasing and other arrangements can be tailored to each investor preferences making solar affordable for all.
Financial	- Grants	- Grants (both taxable and tax-exempt or	

Incentive Category	Description	Incentive Driver	Comment
		excluded from taxable income) are realistic incentives to help cover the investment cost of renewable energy projects.	
Financial	- Green Building Incentive	- Green building incentives are often patterned after achieving LEED (Leadership in Energy and Environmental Design) award status, and benefits such as greater authorized density of allowed occupancy or building size or other rewards.	
Financial	- Leases/Power Purchase Agreements (PPA)	- Lease programs (often time limited to government agency participants) avoid an investor incurring upfront investment costs and instead committing to a long term purchase price lease agreement. Lease: You pay fixed monthly “rent” to provider in return for use of the system for a promised minimum period.	

Incentive Category	Description	Incentive Driver	Comment
Financial	- PACE programs	PPA: You pay a fixed price per kWh for power generated for a promised period of time. Leases and PPA can often times be secured with a lien on property (and could be superior to homestead privileges). - Property-Assessed Clean Energy (PACE) financing allows property owners to borrow money to pay for energy improvements. The amount borrowed is repaid over a period of years through monthly payments independent of property tax billing. The amount borrowed is typically repaid via a special assessment on the property over a period of years. PACE programs allow local governments, state governments, or other inter-jurisdictional authorities, when authorized by state law, to fund the up-front cost of energy	

Incentive Category	Description	Incentive Driver	Comment
		improvements on commercial and residential properties, which are paid back over time by the property owners. The local government issues bonds to fund projects . A PACE assessment is a debt on property, meaning the debt is tied to the property as opposed to the property owner(s), so the repayment obligation may transfer with property ownership, if the buyer agrees to assume the PACE obligation and the new first mortgage holder allows the PACE obligation to remain on the property.	
Financial	- Public Benefits Fund	- Many states have funds, often called "public benefit funds" (PBF), dedicated to supporting energy efficiency, renewable energy and research and development. The funds are collected	

Incentive Category	Description	Incentive Driver	Comment
		either through a small charge on the bill of every electric customer or through specified contributions from utilities. The charge ensures that money is available to fund these investments.	
Financial	- Rebate	- Rebates are typically government or Utility sponsored discounts (refunds) on the upfront cost of a solar system (or other programs such as energy efficiency projects). Size of rebates varies (fixed amount, percentage of system cost up to a cap, performance measured, etc.). Source of rebate funding varies (general tax funds, charge on utility rates, special assessments, etc.).	
Financial	- Solar Renewable Energy Credits (SRECs)	- In SREC state markets, the Renewable Portfolio Standard (RPS) requires electricity	

Incentive Category	Description	Incentive Driver	Comment
		suppliers to secure a portion of their electricity from solar generators. The SREC program provides a means for Solar Renewable Energy Certificates (SRECs) to be created for every megawatt-hour of solar electricity created. - The SREC is sold separately from the electricity and represents the "solar" aspect of the electricity that was produced. The value of an SREC is determined by the market subject to supply and demand constraints. SRECs can be sold to electricity suppliers needing to meet their solar RPS requirement. The market is typically capped by a fine or solar alternative compliance payment (SACP) paid by any electricity suppliers for	

Incentive Category	Description	Incentive Driver	Comment
		every SREC they fall short of the requirement.	
Promotion	- Energy Efficiency Resource Standard	- Many governments pass laws or regulations designed to improve energy efficiency or mandate renewable energy usage. Incentives can include reward payments for compliance or penalties in the form of fees for non-compliance.	- Promotion incentives (typically driven by government regulatory policy or regulations), encourage the use of non-renewable energy by various mechanisms: policy, consumer preferences, permitting standards, education, etc.
Promotion	- Renewable Portfolio Standard	- A renewable portfolio standard (RPS) is a regulation (or policy) by governments that requires the increased production of energy from renewable energy sources, such as wind, solar, biomass, and geothermal. The RPS mechanism places an obligation on electricity supply companies to produce a specified fraction of their electricity from renewable energy	

Incentive Category	Description	Incentive Driver	Comment
		sources. Certified renewable energy generators earn certificates for every unit of electricity they produce and can sell these along with their electricity to supply companies. Supply companies then pass the certificates to some form of regulatory body to demonstrate their compliance with their regulatory obligations.	
Promotion	- Building Energy Codes and Permitting Standards and Energy Standards for Public Buildings and Industry Recruitment Support	- Many governments and their Authority Having Jurisdiction enforce energy building codes requiring commitment and implementation of various energy efficiency and usage obligations before permits are issued. Some jurisdictions give preferential treatment to expedited permitting approval for renewable energy projects.	

Incentive Category	Description	Incentive Driver	Comment
Promotion	- Equipment Certifications	- Some jurisdictions require certain minimum quality certifications before equipment can be permitted for installation (not unlike UL or similar certificates). Such certificates provide a high degree of confidence equipment will perform as advertised.	
Promotion	- Training & Information	- Many governments, utilities and promotion groups offer training (in person or online), information, access to resources, etc. (free or for a modest fee) that promotes renewable energy.	
Promotion	- Generation Disclosure	- Many governments require energy producers to disclose to the public and consumers their mix of fuel use (renewable and non-renewable) which allows consumers to make a more informed choice	

Incentive Category	Description	Incentive Driver	Comment
		as to the source of their energy.	
Promotion	- RECs (green tags) mandated by state law	- Renewable Energy Certificates (RECs), also known as Green tags, Renewable Energy Credits, Renewable Electricity Certificates, or Tradable Renewable Certificates (TRCs), are tradable, non-tangible energy commodities in the United States that represent proof that 1 megawatt-hour (MWh) of electricity was generated from an eligible renewable energy resource (renewable electricity) and was fed into the shared system of power lines which transport energy. Solar renewable energy certificates (SRECs) are RECs that are specifically generated by solar energy. Renewable Energy Certificates provide a mechanism for the	

Incentive Category	Description	Incentive Driver	Comment
		purchase of renewable energy that is added to and pulled from the electrical grid. These certificates can be sold and traded or bartered, and the owner of the REC can claim to have purchased renewable energy. While traditional carbon emissions trading programs use penalties and incentives to achieve established emissions targets, RECs simply incentivize carbon-neutral renewable energy by providing a production subsidy to electricity generated from renewable sources.	
Power Price	- Value of Solar Tariff (VOST)	- Typically under the VOST, a residential customer with an installed PV system is billed for all the electricity consumed in a billing period but is given a credit on the bill for each kilowatt-	- Power Price incentives are among some of the more effective incentive programs that promote renewable energy usage. Financial benefit impacts to the 'bottom line' are always attractive and effective since market forces react almost instantaneously to such stimulus.

Incentive Category	Description	Incentive Driver	Comment
		hour (kWh) of electricity the customer generates with the PV system. The amount of the credit assigned for each kWh of solar energy generated can be calculated by using algorithms and web-based calculations. The VOST can be administratively adjusted annually. The VOST calculation can be based upon several factors including: line loss savings, avoided fuel costs, avoided costs of installing new generation capacity, fuel price hedge value, avoided transmission and distribution expenses, and environmental benefits. Taken together, these savings are intended to reflect the value of distributed solar energy to the utility—a "break-even" value for a specific kind of	

Incentive Category	Description	Incentive Driver	Comment
Power Price	- Net Metering	distributed generation resource, and a value at which the utility is economically neutral to whether it supplies such a unit of energy or obtains it from the customer. - Net Metering is generally where one Utility power meter can run forward (consumer purchasing power from the Utility) or backwards (excess renewable energy from the consumer is sent to the Utility) and by difference ('net metering') is the amount of power usage the owner pays to the Utility. Excess power above Utility power usage is typically carried forward to be offset against future Utility power usage and in some cases a time limit condition when the offset is available after which net	

Incentive Category	Description	Incentive Driver	Comment
		metering is reset to zero and starts over.	
Power Price	- Utility Rate Discount	- Some Utility companies offer an incentive to residential customers for improving the energy efficiency of homes or use of renewable energy resources (such as solar PV systems). To qualify, often the home must meet certain energy standards (such as the standards of the U.S. Environmental Protection Agency's Energy Star-labelled home program and be verified by a registered third party). Customers with eligible houses can receive a discount (such as 5%) on monthly electric bills.	
Power Price	- Performance Based Incentive (PBI)	- PBI are incentives that are paid based on the actual energy production of the solar system. Typically paid based on an energy ($/kWh) basis over a period of time. A solar	

Incentive Category	Description	Incentive Driver	Comment
		system that is paid through a PBI approach must have metering installed that measures the output of the system to confirm non-renewable energy production. Not uncommon incentives are paid monthly over a fixed period of time based on the actual energy (kWh) produced by the solar energy system. The incentive rate ($/kWh) can remain constant for the term of the contract. Using a PBI policy is effective in motivating installers and system owners to focus on proper installation, maintenance, and performance of their systems – since the payment is based upon the actual energy produced.	
Power Price	- Feed In Tariff	- The Feed-In Tariffs are based on the electricity generated by a renewable energy	- In contrast, is the German experience: Germany was one of the first countries to promote FITs.

Incentive Category	Description	Incentive Driver	Comment
		system which is used in the property. There is also an additional bonus for any energy produced which is exported to the electricity grid. This means you get paid more for the energy you don't use than for that which you do which encourages energy efficiency. - At times when you are producing less electricity than you are using, the shortfall will be imported from the grid and you will pay your electricity company for this in the usual way. - The Feed-In Tariffs therefore give three separate financial benefits: 1. A generation tariff payment, which is based on the total electricity generated and the energy type	- Reports about the rising cost of Germany's feed-in tariffs (FITs) for solar PV and about resulting reform efforts have led some to view the German solar support programs as having been too expensive, resulting in oversupply of solar PV, having led to an unreliable electric system, having hurt the competitiveness of the German economy, or all of the above, and hence as being a poor role model for other countries to follow. - The costs of Germany's renewable support (including solar PV) program have indeed been significant – and higher than expected - and the success of those programs have led to penetration levels of renewable energy sources high enough to require modifications to both the renewable program itself and to overall electricity market design. However, a closer look at the German solar support program and its impacts shows that those programs, while having had some flaws, have proven relatively successful, especially given Germany's overall commitment to significantly and rapidly expanding renewable energy production. - The primary lessons from the German experience are that a system of FITs can be highly effective in promoting the growth of solar PV, that the impact on trade-exposed heavy electricity users can and perhaps should be mitigated, but that FITs for new installations should be adjusted regularly and perhaps automatically in response to observed relative to targeted deployment levels so as to avoid undue increases of electricity rates for retail customers. - In hindsight, the German FITs for solar PV did not adjust quickly enough to rates of installations far in excess of what had been expected, even though

Incentive Category	Description	Incentive Driver	Comment
		2. An export tariff payment, which is for any energy exports made to the Utility company when generating more than you use 3. Lower bills from the Utility company for the electricity imported from them	reforms to the renewables law in response to those installations ultimately did introduce much more frequent and steeper reductions in those FITs. - Several important lessons can be learned from the German experience. 1. There is widespread acknowledgement that Germany's solar PV support program has been instrumental in bringing down the cost of solar PV. 2. Associating the high residential retail prices of electricity in Germany purely with the solar PV and other renewable support programs would be misleading. Because of Germany's limited domestic energy resources and dependence on imported energy, Germany's residential retail tariffs would be among the highest in the world even without paying for Germany's renewable let alone solar program. 3. Payments for solar PV have increased substantially in the past. Nonetheless, it would have been preferable to have designed automatic adjustments to the FITs based on known criteria at the outset rather than having to adjust the program on the go. 4. Heavy electricity users in industrial sectors exposed to international trade have been exempt from a significant portion of the renewables levy and generally face electricity prices in line with or even below other European competitors. There is little reason to expect that Germany's solar PV support program has hurt the competitive position of German industry. 5. Even if ex-post a somewhat optimized FIT design might have lowered the cost impact of Germany's

Incentive Category	Description	Incentive Driver	Comment
			solar PV program for retail customers (except the exempt industrial users), high costs incurred to-date are not a good reason to abandon the solar PV program now. 6. The reform efforts of the solar PV and renewable support programs in Germany should not be interpreted as an acknowledgment of a broad failure of the Germany system of FITs. Rather, the reforms are indeed an effort to improve the design of the FIT system.
Tax	- Sales Tax Reduction or Exemption (Business or Personal)	- Taxing governing bodies can either exempt or reduce sales (including value added) tax applicable to purchase of renewable energy equipment.	- Tax incentives are among some of the more effective incentive programs that promote renewable energy usage. Tax benefits that impact the 'bottom line' are always attractive and effective since market forces react almost instantaneously to such stimulus.
Tax	- Business Tax Deduction	- Taxing governing bodies can provide for business expense deductions (and even an uplift to such expenses – allowing a greater deduction than actual expenditures) for renewable energy investments thereby reducing taxable income which results in lower income tax obligations.	
Tax	- Business Tax Exemption	- Taxing governing bodies can provide for	

Incentive Category	Description	Incentive Driver	Comment
		business income tax exemptions (for the life of a project or for a fixed period of time) in regard to otherwise taxable income generated from renewable energy resources.	
Tax	- Personal Tax Deduction	- Taxing governing bodies can provide for personal expense deductions (and even an uplift to such expenses – allowing a greater deduction than actual expenditures) for renewable energy investments thereby reducing taxable income which results in lower income tax obligations.	
Tax	- Business Accelerated Depreciation	- Taxing governing bodies can provide for business accelerated depreciation for renewable energy capital cost expenses thereby reducing taxable income which results in lower income tax obligations.	

<table>
<tr><th>Incentive Category</th><th>Description</th><th>Incentive Driver</th><th>Comment</th></tr>
<tr>
<td>Tax

Tax</td>
<td>- Tax Credit (Business or Personal)

- Property Tax Reduction (Business or Personal)</td>
<td>- Taxing governing bodies can provide for tax credits, deducting dollar for dollar against tax obligations which is usually more beneficial than taking a deduction against taxable income where such taxable income deduction is only beneficial to the extent of the taxpayer’s tax rate and not a dollar for dollar tax obligation offset (see example of benefit between the two).

- Taxing governing bodies can reduce property (ad valorem) tax to the extent of defined reductions based on the expense of investing in renewable energy projects. Such deductions can also be subject to certain system performance objectives.</td>
<td>
Comparison between tax deduction vs tax credit alternative
…illustrating tax credit is generally more beneficial to a taxpayer than a tax deduction
Assumptions:
- Taxable income of $1000 (before solar cost expense deduction; assume not depreciated but expensed)
- Solar expense of $500
- Tax rate of 35%
- 25% of solar expense can be taken as a tax credit and not deducted from taxable income
<table>
<tr><td>Tax dedution analysis</td><td></td><td></td></tr>
<tr><td>a</td><td>Taxable income</td><td>$1,000</td></tr>
<tr><td>b</td><td>Solar expense deduction</td><td>($500)</td></tr>
<tr><td>c</td><td>Adjusted taxable income (a-b)</td><td>$500</td></tr>
<tr><td>d</td><td>Tax due (35%) (c*35%)</td><td>$175</td></tr>
<tr><td>e</td><td>After tax 'profit' c-d)</td><td>$325</td></tr>
<tr><td></td><td></td><td></td></tr>
<tr><td>Tax credit analysis</td><td></td><td></td></tr>
<tr><td>a</td><td>Taxable income</td><td>$1,000</td></tr>
<tr><td>b</td><td>Solar expense</td><td>$500</td></tr>
<tr><td>c</td><td>Solar tax credit (b*25%)</td><td>$125</td></tr>
<tr><td>d</td><td>Solar expense deduction (b-c)</td><td>$375</td></tr>
<tr><td>e</td><td>Adjusted taxable income a-d))</td><td>$625</td></tr>
<tr><td>f</td><td>Tax due (35%*e)</td><td>$219</td></tr>
<tr><td>g</td><td>Tax credit deduction (f-c)</td><td>$94</td></tr>
<tr><td>e</td><td>After tax 'profit' (a-b-g)</td><td>$406</td></tr>
</table>
</td>
</tr>
</table>

Incentive Category	Description	Incentive Driver	Comment

Financial incentive summary: TABLE A

Summary (With or without battery storage)	LEASE Lowest upfront cost	LEASE - POWER PURCHASE AGREEMENT Pay more upfront and save more	PURCHASE (CASH) Own your system	LOAN Own your system and finance it through a loan
System Ownership	Contractor	Contractor	Homeowner	Homeowner
Upfront Payment	$0 to little down	Agreed minimum number of years of energy cost monthly payments (20 typical)	Full system cost, homeowner pays cash, Contractor provides system	Full system cost, homeowner takes out loan with Contractor and Contractor provides system
Monthly Payment	To Contractor	To Contractor	None	To loan provider
Rate Increase Protection (Protection against rising utility rates for the life of the solar system)	Yes	Yes	Yes	Yes
Workmanship Warranty	Normally	Normally	Normally	Normally
Full Service	Yes by Contractor	Yes by Contractor	No by owner	No by owner

Incentive Category	Description	Incentive Driver	Comment	
Roof Warranty (No leaks caused by solar panel installation)	Yes (Normally by installer, 10 years typical)	Yes (Normally by installer, 10 years typical)	Yes (Normally by installer, 10 years typical)	Yes (Normally by installer, 10 years typical)
Monitoring	Yes (Normally by Contractor)	Yes (Normally by Contractor)	No (Owner responsibility)	No (Owner responsibility)
Insurance	Yes (Normally by Contractor)	Yes (Normally by Contractor)	No (Owner responsibility)	No (Owner responsibility)
Performance Guarantee (System vs Equipment)	Yes (Normally by Contractor, typical 100% - 95% for lease)	Yes (Normally by Contractor, typical 100% - 95% for lease)	No (Owner look to individual equipment warranties, not system)	No (Owner look to individual equipment warranties, not system)
Overproduction	Savings to Homeowner (pay for only what is used, Contractor owns any over production)	Savings to Homeowner (pay for only what is used, Contractor owns any over production)	Homeowner owns over production: negative if can't use or sell to Utility grid - positive if can	Homeowner owns over production: negative if can't use or sell to Utility grid - positive if can
Eligible Incentives Recipient (Who benefits?)	Contractor	Contractor	Homeowner	Homeowner
Contractor Agreement Term	Negotiable (typical 20 years)	Negotiable (typical 20 years)	No system agreement (0 years)	No system agreement only loan (0 years)

-

Non-renewable carbon based fossil fuels (Oil and Gas Industry) Incentives

The 'non-renewable' oil and gas fossil fuel (carbon) industry is well established. Carbon is and will remain a component of earth's energy supply future. It historically has been the building block and energy fuel of choice for industrial and human growth…beginning with the burning of carbon based wood fibres.

It is instructional to remember that fundamentally non-renewable energy resources are finite…as it is doubtful humans can wait the millions of years it takes to produce more..so once consumed, is gone. Thus, promoting a good balance between non-renewable and renewable energy resources is a good thing…*all things in moderation*. And to provide incentives for promoting this moderation is also a good thing…whether the incentive is for non-renewable energy or renewable energy.

A summary of incentives available to the non-renewable fossil fuel oil and gas industry is presented in the below table. Included is a description of the incentive, the driver behind the incentive and a complementary comment. It is instructional to appreciate that even in the well-established and successful carbon business…investment incentives remain available.

Incentives associated with the oil and gas exploration and production resource industry.

<table>
<tr><th>Incentive Common Name</th><th>Description</th><th>Incentive Driver</th><th>Comment</th></tr>
<tr>
<td>Intangible Drilling Cost Deductions (IDC)</td>
<td>- IDC deductions allow qualified natural resource (particularly oil and gas) developers to deduct these costs immediately (‘expense them’) when determining taxable income.
- Integrated oil and gas producers (those that also are in the petroleum refining business) are required to capitalize (‘depreciate over a 60-month time period and not expense all at once’) 30% of their IDCs by deducting this depreciated value over time to determine taxable income
- IDCs include costs for designing and fabricating drilling platforms as well as costs associated with wages, fuel, repairs, hauling and supplies
- IDCs could represent up to 80% of the cost of drilling a well.
- IDC costs are associated with unsuccessful exploration wells (‘dry hole’) as well as</td>
<td>- The incentive driver is to deduct as quick as possible costs incurred in any given year to reduce taxable income and thereby lower tax costs.
- Lower tax payments – resulting in higher profits (certainly in the early years of a project if costs are deducted as quickly as possible) are generally achieved by deducting costs immediately (‘expense them’) in contrast to depreciating such costs and deducting them over time.</td>
<td>- In many industries, most costs associated with capital investments (investments whose infrastructure have a life time much longer than a year), will also include design, fabrication, wage, hauling and supplies, must be capitalized and depreciated over time when determining taxable income and tax obligations. Thus, when capital costs are depreciated and deducted for tax purposes over time, taxable income will be higher and thus higher taxes are paid.
- A simplified illustration of incentive benefits compared between expensing (preferred - lower taxes paid - higher after tax profit) and capitalizing (depreciating) costs, is outlined below:
- Assume:
a. $100 units of income for years 1 , 2 and 3
b. 35% tax rate
c. $50 units of IDC expenses in Years 1 and 2, analysed between:
i. Case A, no IDC and all expenses capitalized over 2 year period, straight line depreciation;
ii. Case B, 50% of expenses are IDCs and expensed in year of expenditure and balance depreciated over 2 years
<table><tr><td></td><td></td><td>Year 1</td><td>Year 2</td><td>Year 3</td></tr></table></td>
</tr>
</table>

Incentive Common Name	Description	Incentive Driver	Comment
	successful wells that produce oil or gas.		

a	Income	$100	$100	$100
b	Expenditure	$50	$50	$0
c	Net Income before tax (a-b)	$50	$50	$100
	Case A No IDC			
d	Income (a)	$100	$100	$100
e	Year 1 cost depreciation (b year 1 over two years	-$25	-$25	
f	Year 2 cost depreciation (b year 2 over two years)		-$25	-$25
g	Taxable income (d - e-f)	$75	$50	$75
h	Taxes Paid (g*35%)	$26	$18	$26
i	**Profit (d-b-h)**	**$24**	**$33**	**$74**
	Case B With IDC			
j	Income (a)	$100	$100	$100
k	IDC expense (b*50%)	$25	$25	$0
l	Year 1 cost depreciation (Year 1; (b-k)*.5	$13	$13	
m	Year 2 cost depreciation (Year 2; (b-k)*.5)		$13	$13
n	Taxable income (j-k-l-m)	$63	$50	$88

<table>
<tr><th>Incentive Common Name</th><th>Description</th><th>Incentive Driver</th><th>Comment</th></tr>
<tr><td></td><td></td><td></td><td>
<table>
<tr><td>o</td><td>Taxes paid (n*35%)</td><td>$22</td><td>$18</td><td>$31</td></tr>
<tr><td>p</td><td>Profit (j-b-o)</td><td>$28</td><td>$33</td><td>$69</td></tr>
</table>
As desired, Case B (with IDC incentive) has more favourable after tax profit in the early years compared with Case A (no IDC incentive)
</td></tr>
<tr><td>Percentage Depletion Allowance (PDA) and Cost Depletion Allowance (CDA)</td><td>- An oil and gas producer taxpayer or royalty owner can deduct for determining taxable income, the higher of PDA or CDA on a property by property basis. One property can benefit from PDA while another property benefits from CDA.
- Depletion is based on the principle that as oil or gas in the ground resource is produced and the underground reservoir is ‘depleted’, a taxpayer may deduct from its income (reducing taxable income) an IRS depletion allowance (somewhat akin to an inventory asset – the underground reservoir - being reduced in time or depleted. And this reduction in</td><td>- PDA allowance may only be taken by independent producers and royalty owners and not by integrated (those with refineries) oil companies.
- PDA may only be claimed up to specific daily USA (not foreign) production levels of 1,000 barrels of oil or 6,000 mcf of natural gas (so PDA is modest in size incentive).
- PDA is limited to 65% of net taxable income.
- The net income limitation requires PDA to be calculated on a property-by-property basis.
- PDA is prohibited to the extent it exceeds the net income from a particular</td><td>- PDA is calculated based on a percentage of gross income from the property. Percentage depletion can only be taken by a property that has net income. If a property has a net loss, percentage depletion cannot be deducted in the current year.
- Net income is calculated by subtracting the following from Oil and Gas Gross Revenue on a property by property basis:
Lease Operating Expenses, Production Taxes, Intangible Drilling Costs, Dry Hole Costs, Depreciation from Tangible Drilling Cost, Other Expenses, and Overhead Expenses
- It is important to allocate depreciation expense to the correct property as it is used to calculate net income for that property.
- Once net income is calculated, multiply gross income by 15% for those properties that did not have a loss.
- The allowable statutory percentage depletion deduction is the lesser of net income or 15% of gross income.
- If net income is less than 15% of gross income, the deduction is limited to 100% of net income (before the deduction for depletion).</td></tr>
</table>

Incentive Common Name	Description	Incentive Driver	Comment
	reservoir (inventory) value, being allowed a tax break for such value reduction. - Depletion allowance deductions reduces taxable income without having an actual expense to back it up. It is comparable to being able to reduce current income by arbitrarily 15% (thereby reducing taxable income which reduces tax obligations) just because the IRS said you could.	property. These limitations apply both for regular and alternative minimum tax purposes. - PDA in excess of the 65% limit may be carried over to future years until it is fully utilized. - PDA is not limited to the actual depletable base (actual recoverable oil and gas in the reservoir to be produced) of the property and can be deducted as long as the property generates income. - CDA depletion allowance is the easier to calculate. It is calculated based on the adjusted depletable base (the expected amount of oil or gas to be produced from an underground reservoir) of the property as follows: - CD = [CP ÷ (CP + ER)] X DTB - CD = Cost Depletion Allowance	- An example of Percentage Depletion and Cost Depletion Allowance calculations are illustrated below (and in this example it is assumed: Cost Depletion is the greater deduction and since it is greater than net income, taxable income is less than 0 or negative, and no income tax is due in that year of analysis). - Assumptions and calculations are illustrated in the below table.

Incentive Common Name	Description	Incentive Driver	Comment
		- CP = Current units sold (income generated from the sale of oil and gas) - ER = Ending reserves (the amount of oil and gas volumes remaining in the ground to be ultimately produced) - DTB = Depletable Tax Basis remaining as of the end of the current tax year before current tax depletion is applied. - Depletion deductions (bot PDA and CDA) can be in excess of actual project investment costs.	

Incentive Common Name	Description	Incentive Driver	Comment

		a	b	c	d	e	f	g	h	i
Property Number	Property Description	Gross Income (assumed)	Lease Operating Expenses (assumed)	Production Taxes (assumed)	IDC Expense (assumed)	Dry Hole Costs (assumed)	Depreciation (assumed)	Other Expenses (assumed)	Overhead Expenses (assumed)	Net Income (a-b-c-d-e-f-g-h)
1	Property A	300,000	200,000	5,000	3,000	-	46,000	-	-	46,00

		j	k	l	m	n	o	p	q	r
Property Number	Property Description	% Depletion (a*15%)	% Depletion Limited to Net Income (i if >0, if i is negative then 0)	Statutory Depletion (if k is less than j, then k, else use j)	Average Daily Production (t/365)	Quantity Limitation Rate (if m > 1,000, then 1000/m; else if m < 1000, n = 1)	Percentage Depletion (n*l)	Prior Year % Depletion Carryover (assumed)	Total % Depletion (o+p)	Carry Forward to Nex Year (if k < j then greater o 0 or j-z else 0)
1	Property A	45,000	46,000	45,000	1,315.07	0.76042	34,219	24,300	58,519	-

		s	t	u	v	w	x	y	z	aa
Property Number	Property Description	Beginning Reserves (assumed)	Production (assumed)	Ending Reserves (assumed)	Basis (assumed)	Beginning Accumulated Depletion (assumed)	Adjusted Basis (v-w)	Cost Depletion Rate (if u = 0 then 0, else t/(u+t)	Cost Depletion (x*y)	Allowable Depletion (if j < k then greater if z or q else q)
1	Property A	1,300,000	480,000	800,000	3,300,000	960,000	2,340,000	0.375	877,500	877,500

Deduction for Tertiary Injectates	- Tertiary recovery (or so called enhanced oil recovery) includes a variety of ways (water, gas, CO2, etc.) injection into a producing oil and gas reservoir to repressure the reservoir for the purpose of improving depleted and declining oil and gas production.	- Deduction for Tertiary injectates is based on a taxpayers right to expense or immediately deduct from taxable income the expense of tertiary injectates (without limit) thereby reducing taxes	- Many industries are required to depreciate and deduct over time expenses associated with investments that result in long term (> 1 year) benefits. - Depreciation instead of immediate expense deduction results in higher taxable income calculations and thus higher tax payments in the early years. - The oil and gas industry is allowed the incentive to expense (immediate deduction) instead of

<table>
<tr><th>Incentive Common Name</th><th>Description</th><th>Incentive Driver</th><th>Comment</th></tr>
<tr><td></td><td></td><td></td><td>depreciating expenses over time incurred that result in long term benefits.
- The below illustrative example of Tertiary injectates deduction demonstrates the higher profit associated with an expense (immediate deduction) Case A vs depreciation Case B when determining taxable income and tax obligation.</td></tr>
<tr><td></td><td></td><td></td><td>
<table>
<tr><td></td><td></td><td>Year 1</td><td>Year 2</td><td>Year 3</td></tr>
<tr><td>a</td><td>Income</td><td>$100</td><td>$100</td><td>$100</td></tr>
<tr><td>b</td><td>Expenditure</td><td>$50</td><td>$50</td><td>$0</td></tr>
<tr><td>c</td><td>Net Income before tax (a-b)</td><td>$50</td><td>$50</td><td>$100</td></tr>
<tr><td></td><td>Case A</td><td></td><td></td><td></td></tr>
<tr><td>d</td><td>Income (a)</td><td>$100</td><td>$100</td><td>$100</td></tr>
<tr><td>e</td><td>Expense costs</td><td>-$50</td><td>-$50</td><td></td></tr>
<tr><td>f</td><td>Taxable income (d - e-f)</td><td>$50</td><td>$50</td><td>$100</td></tr>
<tr><td>g</td><td>Taxes Paid (f*35%)</td><td>$18</td><td>$18</td><td>$35</td></tr>
<tr><td>h</td><td>Profit (d-b-h)</td><td>$33</td><td>$33</td><td>$65</td></tr>
<tr><td></td><td>Case B</td><td></td><td></td><td></td></tr>
<tr><td>i</td><td>Income (a)</td><td>$100</td><td>$100</td><td>$100</td></tr>
</table>
</td></tr>
</table>

<table>
<tr><th>Incentive Common Name</th><th>Description</th><th>Incentive Driver</th><th>Comment</th></tr>
<tr><td></td><td></td><td></td><td>
<table>
<tr><td>j</td><td>Year 1 cost depreciation (Year 1; b*.5</td><td>$25</td><td>$25</td><td></td></tr>
<tr><td>k</td><td>Year 2 cost depreciation (Year 2; b*.5)</td><td></td><td>$25</td><td>$25</td></tr>
<tr><td>l</td><td>Taxable income (j-k-l-m)</td><td>$75</td><td>$50</td><td>$75</td></tr>
<tr><td>m</td><td>Taxes paid (l*35%)</td><td>$26</td><td>$18</td><td>$26</td></tr>
<tr><td>n</td><td>Profit (j-b-o)</td><td>$24</td><td>$33</td><td>$74</td></tr>
</table>
</td></tr>
<tr><td>Amortization Period for Geological and Geophysical (G&G) Costs</td><td>- G&G surveys are technical operations (comparable to a sonogram) that uses sound or energy waves, transmitted into the subsurface of the earth, and when bounced backed (‘echo’ effect) off of subsurface rock surfaces – and the traveling energy or sound wave traveling at different velocities depending on subsurface rock properties (harder rock tends to have faster sound velocities) and formations, recorded and interpreted, to help locate oil</td><td>- Although G&G expenses do not contribute directly to income, investing companies benefit from the property assessed by G&G, throughout the life of the company’s use of the property.
- However, the amortization period for G&G expenses have a much smaller depreciation timeframe (2 year for small</td><td>- Typically, in most industries, expenses that have a beneficial impact greater than a year are depreciated (for determining taxable income purposes) over time comparable to the life of the property and deducted from taxable income tax.
- The below illustrative example of G&G amortized deduction demonstrates the higher profit associated with a shorter amortization period (quicker deduction) Case A vs longer depreciation Case B when determining taxable income and tax obligation.
- Assume:
d. $100 units of income over years 1-8
e. $50 units of G&G costs in year 1
f. 35% tax rate
g. Case A: G&G costs amortized over 2 years
h. Case B: G&G costs amortized over 7 years</td></tr>
</table>

Incentive Common Name	Description	Incentive Driver	Comment
	and gas deposits. A sonogram picture is made to illustrate subsurface characteristics and formations. - The expense for G&G are associated with normally long term investment objectives (greater than a year), such as finding oil and gas that will be produced for many years. - G&G expenses for smaller oil and gas companies are deducted from taxable income over a 2-year period (2-year amortization). - Large integrated (having refinery operations) oil and gas companies must amortize their G&G costs over a longer 7-year period.	companies, vs 7 for large companies).	

<table>
<tr><th>Incentive Common Name</th><th>Description</th><th>Incentive Driver</th><th>Comment</th></tr>
<tr><td></td><td colspan="3">
<table>
<tr><th></th><th></th><th>Year 1</th><th>Year 2</th><th>Year 3</th><th>Year 4</th><th>Year 5</th><th>Year 6</th><th>Year 7</th><th>Year 8</th></tr>
<tr><td>a</td><td>Income</td><td>$100</td><td>$100</td><td>$100</td><td>$100</td><td>$100</td><td>$100</td><td>$100</td><td>$100</td></tr>
<tr><td>b</td><td>Expenditure</td><td>$50</td><td>$0</td><td>$0</td><td>$0</td><td>$0</td><td>$0</td><td>$0</td><td>$0</td></tr>
<tr><td>c</td><td>Net Income before tax (a-b)</td><td>$50</td><td>$100</td><td>$100</td><td>$100</td><td>$100</td><td>$100</td><td>$100</td><td>$100</td></tr>
<tr><td></td><td>Case A</td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr>
<tr><td>d</td><td>Income (a)</td><td>$100</td><td>$100</td><td>$100</td><td>$100</td><td>$100</td><td>$100</td><td>$100</td><td>$100</td></tr>
<tr><td>e</td><td>2 year amortization</td><td>-$25</td><td>-$25</td><td>$0</td><td>$0</td><td>$0</td><td>$0</td><td>$0</td><td>$0</td></tr>
<tr><td>f</td><td>Taxable income (d - e-f)</td><td>$75</td><td>$75</td><td>$100</td><td>$100</td><td>$100</td><td>$100</td><td>$100</td><td>$100</td></tr>
<tr><td>g</td><td>Taxes Paid (f*35%)</td><td>$26</td><td>$26</td><td>$35</td><td>$35</td><td>$35</td><td>$35</td><td>$35</td><td>$35</td></tr>
<tr><td>h</td><td>Profit (d-b-h)</td><td>$24</td><td>$74</td><td>$65</td><td>$65</td><td>$65</td><td>$65</td><td>$65</td><td>$65</td></tr>
<tr><td></td><td>Case B</td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr>
<tr><td>i</td><td>Income (a)</td><td>$100</td><td>$100</td><td>$100</td><td>$100</td><td>$100</td><td>$100</td><td>$100</td><td>$100</td></tr>
<tr><td>j</td><td>7 year amoritzation</td><td>$7.14</td><td>$7.14</td><td>$7.14</td><td>$7.14</td><td>$7.14</td><td>$7.14</td><td>$7.14</td><td>$0</td></tr>
<tr><td>k</td><td>Taxable income (i-j)</td><td>$93</td><td>$93</td><td>$93</td><td>$93</td><td>$93</td><td>$93</td><td>$93</td><td>$100</td></tr>
<tr><td>l</td><td>Taxes paid (l*35%)</td><td>$33</td><td>$33</td><td>$33</td><td>$33</td><td>$33</td><td>$33</td><td>$33</td><td>$35</td></tr>
<tr><td>m</td><td>Profit (i-b-l)</td><td>$18</td><td>$68</td><td>$68</td><td>$68</td><td>$68</td><td>$68</td><td>$68</td><td>$65</td></tr>
</table>
</td></tr>
<tr><td>Last in, First out Accounting (LIFOA)</td><td>- LIFOA is a method for estimating the value of a company’s inventory (such as produced and stored oil) against the value of goods sold (the selling price per barrel of oil) in a given year.
- LIFOA could result in artificially reducing the value of inventory to reduce tax liability, since over time, the cost to produce oil could be higher in later periods than earlier periods.</td><td>- LIFOA often times results in lower ‘artificial’ time distorted profit and thus lower taxable income and thus lower taxes paid.
- Thus, costs and revenues are not matched to the same time scale, but distorted in time.</td><td>- Many industries determine profit and taxable income by deducting from the sale price revenue of goods, the costs of the goods incurred at the same time.
- The below illustrative example of LIFOA demonstrates the higher profit associated with LIFOA (time distorted) Case A vs a First In First Out Accounting (FIFOA not time distorted) Case B when determining taxable income and tax obligation.
- Assume:
i. Sale revenue incurred monthly over a tax year starts at $100 in month 1 and increases by $10 each month, ending at $210 for month 12.</td></tr>
</table>

Incentive Common Name	Description	Incentive Driver	Comment
	- Taxable profit is determined by deducting from sales price revenue, the cost of goods (or oil). If later produced oil ('Last In' oil) stored in a tank that also contains oil produced from earlier times, has a higher production cost than earlier produced oil having a lower cost to produce, then profit or taxable income is lower (later incurred expenses are deducted first against later higher priced sold oil) resulting in lower taxes, when the LIFOA is used.		j. Costs of goods starts at $10 in month 1 increasing $5 per month, ending at $65 in month 12 k. 35% tax rate (and taxes paid monthly) l. Case A: LIFOA and Case B FIFOA

<table>
<tr><th>Incentive Common Name</th><th>Description</th><th>Incentive Driver</th><th>Comment</th></tr>
<tr><td></td><td>
<table>
<tr><th></th><th></th><th>Month1</th><th>Month2</th><th>Month3</th><th>Month4</th><th>Month5</th><th>Month6</th><th>Month7</th><th>Month8</th><th>Month9</th><th>Month10</th><th>Month11</th><th>Month12</th><th>Year</th></tr>
<tr><td>a</td><td>Income</td><td>$100</td><td>$110</td><td>$120</td><td>$130</td><td>$140</td><td>$150</td><td>$160</td><td>$170</td><td>$180</td><td>$190</td><td>$200</td><td>$210</td><td></td></tr>
<tr><td>b</td><td>Expenditure</td><td>$10</td><td>$15</td><td>$20</td><td>$25</td><td>$30</td><td>$35</td><td>$40</td><td>$45</td><td>$50</td><td>$55</td><td>$60</td><td>$65</td><td></td></tr>
<tr><td>c</td><td>Net Income before tax (a-b)</td><td>$90</td><td>$95</td><td>$100</td><td>$105</td><td>$110</td><td>$115</td><td>$120</td><td>$125</td><td>$130</td><td>$135</td><td>$140</td><td>$145</td><td></td></tr>
<tr><td></td><td>Case A FIFOA</td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr>
<tr><td>d</td><td>Income (a)</td><td>$100</td><td>$110</td><td>$120</td><td>$130</td><td>$140</td><td>$150</td><td>$160</td><td>$170</td><td>$180</td><td>$190</td><td>$200</td><td>$210</td><td></td></tr>
<tr><td>e</td><td>LIFOA deduction (b)</td><td>$65</td><td>$60</td><td>$55</td><td>$50</td><td>$45</td><td>$40</td><td>$35</td><td>$30</td><td>$25</td><td>$20</td><td>$15</td><td>$10</td><td></td></tr>
<tr><td>f</td><td>Taxable income (d - e)</td><td>$35</td><td>$50</td><td>$65</td><td>$80</td><td>$95</td><td>$110</td><td>$125</td><td>$140</td><td>$155</td><td>$170</td><td>$185</td><td>$200</td><td></td></tr>
<tr><td>g</td><td>Taxes Paid (f*35%)</td><td>$12.25</td><td>$17.50</td><td>$22.75</td><td>$28.00</td><td>$33.25</td><td>$38.50</td><td>$43.75</td><td>$49.00</td><td>$54.25</td><td>$59.50</td><td>$64.75</td><td>$70.00</td><td>$493.</td></tr>
<tr><td>h</td><td>Profit (d-e-g)</td><td>$87.75</td><td>$92.50</td><td>$97.25</td><td>$102.00</td><td>$106.75</td><td>$111.50</td><td>$116.25</td><td>$121.00</td><td>$125.75</td><td>$130.50</td><td>$135.25</td><td>$140.00</td><td>$1,366.</td></tr>
<tr><td></td><td>Case B LIFOA</td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr>
<tr><td>i</td><td>Income (a)</td><td>$100</td><td>$110</td><td>$120</td><td>$130</td><td>$140</td><td>$150</td><td>$160</td><td>$170</td><td>$180</td><td>$190</td><td>$200</td><td>$210</td><td></td></tr>
<tr><td>j</td><td>FIFOA deduction (b)</td><td>$10</td><td>$15</td><td>$20</td><td>$25</td><td>$30</td><td>$35</td><td>$40</td><td>$45</td><td>$50</td><td>$55</td><td>$60</td><td>$65</td><td></td></tr>
<tr><td>k</td><td>Taxable income (i-j)</td><td>$90</td><td>$95</td><td>$100</td><td>$105</td><td>$110</td><td>$115</td><td>$120</td><td>$125</td><td>$130</td><td>$135</td><td>$140</td><td>$145</td><td></td></tr>
<tr><td>l</td><td>Taxes paid (l*35%)</td><td>$31.50</td><td>$33.25</td><td>$35.00</td><td>$36.75</td><td>$38.50</td><td>$40.25</td><td>$42.00</td><td>$43.75</td><td>$45.50</td><td>$47.25</td><td>$49.00</td><td>$50.75</td><td>$493.</td></tr>
<tr><td>m</td><td>Profit (i-j-l)</td><td>$58.50</td><td>$61.75</td><td>$65.00</td><td>$68.25</td><td>$71.50</td><td>$74.75</td><td>$78.00</td><td>$81.25</td><td>$84.50</td><td>$87.75</td><td>$91.00</td><td>$94.25</td><td>$916.</td></tr>
</table>
</td><td></td><td></td></tr>
<tr><td>Section 199 (IRC): Domestic Production Activities Reduction</td><td>- The Section 199 deduction (also referred to as the domestic manufacturing deduction, U.S. production activities deduction, or domestic production deduction) is a tax break for businesses that perform domestic manufacturing and certain other production activities, such as natural gas production.
- The deduction is limited to the income produced by qualifying activities. Income from qualified production activities is calculated as</td><td>- The following example illustrates how the Section 199 deduction (and thus lower tax payments) would be calculated in certain circumstances:
- For the year ended December 31, 2010, Nat Gas Prod Company, Inc. (a for profit C-Corp) had taxable income, all from qualifying manufacturing activities, of $1 million and paid $100,000 in W-2 wages.</td><td>- The below illustrative example of DPRA demonstrates the profit associated with Case A vs Case B (cases have different wage payments) when determining taxable income and tax obligations.
- Assume:
o Sale revenue incurred at $2 million per year for 3 years.
o Annual expenses of $1 million
o 35% tax rate
o Case A: $100,000 annual W-2 wages; Case B: $200,000 annual W-2 wages</td></tr>
</table>

Incentive Common Name	Description	Incentive Driver	Comment
	domestic production gross receipts (DPGR) less cost of goods sold and other expenses that are directly allocable to production of DPGR. After the lesser of the DPGR or taxable income is multiplied by the applicable percentage (currently 9%), the deduction is further limited to 50% of Form W-2 wages allocable to DPGR. - Exclusion for extraterritorial income (ETI) from U.S. taxation was a United States incentive for export of manufactured goods but was replaced, when the exclusion was determined to violate World Trade Organization rules, by the Section 199 domestic production deduction.	- Nat Gas will be entitled to a Section 199 deduction of $50,000 due to the 50% limit of W-2 wages. If the W-2 wages had been greater than $180,000, the deduction would have been $90,000 [$1 million X 9%]. - The calculation is somewhat confusing but better illustrated in the next example.	

<table>
<tr><th>Incentive Common Name</th><th>Description</th><th>Incentive Driver</th><th>Comment</th></tr>
<tr><td></td><td colspan="3">
<table>
<tr><th></th><th></th><th>Year 1</th><th>Year 2</th><th>Year 3</th></tr>
<tr><td>a</td><td>Income</td><td>$2,000,000</td><td>$2,000,000</td><td>$2,000,000</td></tr>
<tr><td>b</td><td>Expenditure</td><td>$1,000,000</td><td>$1,000,000</td><td>$1,000,000</td></tr>
<tr><td>c</td><td>Net Income (a-b)</td><td>$1,000,000</td><td>$1,000,000</td><td>$1,000,000</td></tr>
<tr><td></td><td>Case A</td><td></td><td></td><td></td></tr>
<tr><td>d</td><td>Annual G&A</td><td>$100,000</td><td>$100,000</td><td>$100,000</td></tr>
<tr><td>e</td><td>50% of G&A (50%*d)</td><td>$50,000</td><td>$50,000</td><td>$50,000</td></tr>
<tr><td>f</td><td>9% DPRA deduction (9%*c)</td><td>$90,000</td><td>$90,000</td><td>$90,000</td></tr>
<tr><td>g</td><td>Allowed deduction (lesser of e or f)</td><td>$50,000</td><td>$50,000</td><td>$50,000</td></tr>
<tr><td>h</td><td>Taxable income (c-g)</td><td>$950,000</td><td>$950,000</td><td>$950,000</td></tr>
<tr><td>i</td><td>Tax (35%*h)</td><td>$332,500</td><td>$332,500</td><td>$332,500</td></tr>
<tr><td>j</td><td>Profit (c-i)</td><td>$667,500</td><td>$667,500</td><td>$667,500</td></tr>
<tr><td></td><td>Case B</td><td></td><td></td><td></td></tr>
<tr><td>k</td><td>Annual G&A</td><td>$200,000</td><td>$200,000</td><td>$200,000</td></tr>
<tr><td>l</td><td>50% of G&A (50%*k)</td><td>$100,000</td><td>$100,000</td><td>$100,000</td></tr>
<tr><td>m</td><td>9% DPRA deduction (9%*c)</td><td>$90,000</td><td>$90,000</td><td>$90,000</td></tr>
<tr><td>n</td><td>Allowed deduction (lesser of l or m)</td><td>$90,000</td><td>$90,000</td><td>$90,000</td></tr>
<tr><td>o</td><td>Taxable income (c-n)</td><td>$910,000</td><td>$910,000</td><td>$910,000</td></tr>
<tr><td>p</td><td>Tax (35%*o)</td><td>$318,500</td><td>$318,500</td><td>$318,500</td></tr>
<tr><td>q</td><td>Profit (c-p)</td><td>$681,500</td><td>$681,500</td><td>$681,500</td></tr>
</table>
</td></tr>
<tr><td>Master Limited Partnerships (MLP)</td><td>- An MLP is a partnership legal and tax structure, or a limited liability company (LLC) with ownership interests (units or ‘shares’) traded on a public stock exchange or an over-the-counter market, like stock in a corporation.
- MLPs have characteristics like a corporate structure, in</td><td>- MLPs provide for limited liability protection like a corporation, but taxation is like a partnership.</td><td>The below illustrative example of an MLP compared to a corporation demonstrates the profit associated with Case A (corporation) vs Case B (MLP) when determining taxable income and tax obligations.
- Assume:
• Taxable income of $100 units per year for 3 years.
• 35% corporate tax rate
• 30% personal income tax rate
• $10 units per year in dividends
Case A: Corporation tax</td></tr>
</table>

Incentive Common Name	Description	Incentive Driver	Comment
	particular limited liability of owners. - To qualify as an MLP, 90% of the income of the MLP must come from qualified sources (thus a special or incentivized class of taxpayers), including specified natural resource activity (such as oil and gas exploration and production). - MLP's are taxed like a partnership (where each owner is taxed at its individual tax rate and likewise benefits from tax deductions incurred by the MLP) unlike a corporation where corporation profits are taxed at corporate income tax rate and when dividends paid to stock owners such dividends are taxed again at personal income tax rates as taxable income. - Like corporation stock, MLP units can when traded fluctuate in value and such value fluctuation is subject to (lower) capital gains tax rates vs higher personal income tax rates.		Case B: MLP tax

<table>
<tr><th>Incentive Common Name</th><th>Description</th><th>Incentive Driver</th><th>Comment</th></tr>
<tr><td></td><td></td><td colspan="2"><table>
<tr><td></td><td></td><td>Year 1</td><td>Year 2</td><td>Year 3</td></tr>
<tr><td>a</td><td>Taxable income</td><td>$100</td><td>$100</td><td>$100</td></tr>
<tr><td></td><td>Case A corporation</td><td></td><td></td><td></td></tr>
<tr><td>b</td><td>Dividents paid</td><td>$10</td><td>$10</td><td>$10</td></tr>
<tr><td>c</td><td>Corporate tax (35%*a)</td><td>$35</td><td>$35</td><td>$35</td></tr>
<tr><td>d</td><td>Personal income tax (30%*b)</td><td>$3</td><td>$3</td><td>$3</td></tr>
<tr><td>e</td><td>Total tax paid (c+d)</td><td>$38</td><td>$38</td><td>$38</td></tr>
<tr><td></td><td>Case B MLP</td><td></td><td></td><td></td></tr>
<tr><td>f</td><td>Corporate tax (0*a)</td><td>$0</td><td>$0</td><td>$0</td></tr>
<tr><td>g</td><td>Personal income tax (30%*a)</td><td>$30</td><td>$30</td><td>$30</td></tr>
<tr><td>h</td><td>Total tax paid (f+g)</td><td>$30</td><td>$30</td><td>$30</td></tr>
</table></td></tr>
<tr><td>‘Tax exempt’ Farmout</td><td>- In the oil and gas exploration business, it is not uncommon for investors in an oil and gas lease to bring in one or more ‘partners’ to help pay for the costs of exploration to reduce risk and by doing so, the ‘partner’ will earn a participating interest in the underlying oil and gas lease.
- In the oil and gas industry such a transaction is called a ‘Farmout’ (and can also be described as a purchase and sale agreement).</td><td>- Tax exempt Farmout deals are a special incentive to oil and gas companies to promote exploration of risky natural resources projects. Risky in that there is usually a low probability of finding oil and gas when exploration costs are spent.</td><td>The below illustrative example of a Farmout demonstrates the tax-exempt incentive associated with Case A (no Farmout) vs Case B (Farmout) when determining taxable income and tax obligations.
- Assume:
- Year 1 exploration costs of $100 units
- Party A initially owns 100% of an oil lease
- Party B wishes to earn 30% participating interest in the lease, leaving Party A with 70%
- To earn the 30% interest, Party B is willing to fund and pay for not only 30% of the exploration cost but also a promote payment (premium) of an additional 20% such that Party B earns 30% interest but pays 50% of the exploration costs</td></tr>
</table>

<table>
<tr><th>Incentive Common Name</th><th>Description</th><th>Incentive Driver</th><th>Comment</th></tr>
<tr><td></td><td>- Typically the cost of entry by the ‘partner’ includes not only the to be earned participating interest share of costs (in the trade called the ‘ground floor’ share of cost) but also an additional premium payment (typically called a ‘promote’).
- Unlike typical purchase and sale agreements where excess payments (in effect a ‘profit’) above ground floor costs where sales profits are taxable income, Farmout promotes are not considered by the IRS as taxable income, but exempt from taxation.</td><td></td><td>- In year 2 the lease is successful and has income of $200 Units from which the $100 exploration cost may be deducted.
- Party A and B income tax rate is 30%
.</td></tr>
<tr><td></td><td></td><td colspan="2"><table>
<tr><td></td><td></td><td>Year 1</td><td>Year 2</td></tr>
<tr><td>a</td><td>Exploration expense, 100%</td><td>$50</td><td>$0</td></tr>
<tr><td>b</td><td>Income, 100%</td><td>$0</td><td>$200</td></tr>
<tr><td></td><td>No farmout</td><td></td><td></td></tr>
<tr><td>c</td><td>A's taxable income (b-a)</td><td>$0</td><td>$150</td></tr>
<tr><td>d</td><td>A's tax (30%*c)</td><td>$0</td><td>$45</td></tr>
<tr><td>e</td><td>A's profit (c-d)</td><td>$0</td><td>$105</td></tr>
<tr><td></td><td colspan="3">Farmout without promote tax exemption (promote considered taxable income to A)</td></tr>
<tr><td>f</td><td>A expense share (50%*a)</td><td>$25</td><td>$0</td></tr>
</table></td></tr>
</table>

Incentive Common Name	Description	Incentive Driver				Comment
		g	A income share (70%*b)	$0	$140	
		h	A promote income (20%*a)	$0	$10	
		i	A taxable income (g+h-f)	$0	$125	
		j	A tax (30%*i)	$0	$38	
		k	A profit (i-j)	$0	$88	
		l	B expense share (50%*a)	$25	$0	
		m	A income share (30%*b)	$0	$60	
		n	A promote income (0%*a)	$0	$0	
		o	A taxable income (m+n-l)	$0	$35	
		p	A tax (30%*o)	$0	$11	
		q	A profit (o-p)	$0	$25	
		r	Total tax paid, A and B (j+p)	$0	$48	
			Farmout with promote tax exemption (no promote income to A)			
		s	A expense share (50%*a)	$25	$0	
		t	A income share (70%*b)	$0	$140	
		u	A promote income (0%*a)	$0	$0	
		v	A taxable income (s+t-w)	$0	$115	
		w	A tax (30%*v)	$0	$35	
		x	A profit (v-w)	$0	$81	

Incentive Common Name	Description	Incentive Driver				Comment
		y	B expense share (50%*a)	$25	$0	
		z	A income share (30%*b)	$0	$60	
		aa	A promote income (0%*a)	$0	$0	
		bb	A taxable income (z+aa-y))	$0	$35	
		cc	A tax (30%*bb)	$0	$11	
		dd	A profit (bb-cc)	$0	$25	
		ee	Total tax paid, A and B w+cc))	$0	$45	

Conclusion

Both…

- investment behaviour goals (compare higher income tax rates against lower capital gains tax rates, whereby the latter encourages investment in development projects and spending of funds to generate job and create value) and
- public policy objective goals (compare subsidies to farmers growing corn for conversion to ethanol and addition to gasoline as a form of environmental regulation and reduction of foreign imported fossil fuels),

are advanced and encouraged by incentives, offered typically by government bodies, but public and private entities can likewise offer incentives.

Incentives are available in many forms and 'speeds' (some cause desired behaviour to happen quickly and others more gradually).

Incentives are a natural and fundamental economic growth tool for any jurisdiction and any industry, including evolving and desired industries such as solar. Incentives are not contrary to free market economics, and on the contrary, promote such, especially where options are developed. And when choices exist, efficient market forces thrive.

The timing when to modify or even eliminate an incentive is dependent on many factors, least of which to what extent a desired behaviour has been implemented and a desired objective met. Knowing when desired objectives are met can be a challenge to assess. As noted, incentives in the established oil and gas industry remain intact as a reminder certain behaviours and goals remain to be attained.

Larry D. Killion
11235ldk@comcast.net
+1 713 906-9135

References

DESIRE, http://www.dsireusa.org, (Database of State Incentives for Renewables & Efficiency®)

Mark Sweeney, *Pro: Incentives — An Effective Tool for Economic Development,* senior principal for McCallum Sweeney Consulting, based in Greenville, S.C., Business Xpansion Journal (January 2006, http://www.bxjonline.com/bxj/article.asp?magarticle_id=919&mag_); msweeney@mccallumsweeney.com.

Solar Energy International*, Solar Electric Handbook, Photovoltaic Fundamentals and Applications*, 2nd Edition (2013)

Tax Payers for Common Sense, *Understanding Oil and Gas Tax Subsidies (April 2004).*

U.S. Code: Title 26 - INTERNAL REVENUE CODE, Pub. L. 114-38