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Research & Policy Paper

The New, Green Economy

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SUBMITTED TO

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EXECUTIVE SUMMARY

Rising energy costs, the threat of global warming, the economic slowdown, and the sustained loss of blue collar jobs in manufacturing are encouraging policymakers to take another look at alternative energy sources and environmentally friendly products and services. Growing a ***green economy*** and putting people to work in ***green*** industries is both politically attractive and economically promising. The U.S. Environmental Protection Agency recently issued a tentative finding declaring that high concentrations of greenhouse gases are bad for human health and the environment. Issuing the proposed finding moves the government closer to regulating greenhouse gas emissions created by human activities, such as operating power plants and driving vehicles. The action also reflects the administration's intent to reverse some of the environmental policies championed by the Bush administration.

"The effects of climate change observed to date and projected to occur in the future – including but not limited to the increased likelihood of more frequent and intense heat waves, more wildfires, degraded air quality, more heavy downpours and flooding, increased drought, greater sea level rise, more intense storms, harm to water resources, harm to agriculture, and harm to wildlife and ecosystems – are effects on public health and welfare within the meaning of the Clean Air Act," according to the proposed finding.

President Obama’s budget promises what it calls a comprehensive effort to address global warming, slash oil imports and create a new "green" economy that produces millions of new jobs. The White House estimates that the plan, built around a cap-and-trade program to limit greenhouse gas emissions, will produce $150 billion over 10 years beginning in 2012 to finance renewable energy projects and another $65 billion a year to pay for middle-class tax credits. Any further revenue from the sale of emissions permits will be returned to families, communities and businesses that suffer hardship as the result of higher energy prices.

Entering into the green marketplace to keep pace with customer and societal demands to reduce environmental and social impacts is not an easy task. Socially and environmentally responsible companies are better managed, not embroiled in costly lawsuits and have made strides to reduce their own environmental footprint in ways that actually lower costs. Ethics values are spreading into even the largest of traditional businesses like General Electric, Wal-Mart, and so forth. Shareholder activism, community investing, social and environmental screens and socially responsible venture capital are transforming the corporate policies and enacting change from within.

The private sector’s innovation and technology based solutions together with public sector taxing and incentive policies can result in unprecedented job creation which will address some of our most pressing environmental challenges. The public awareness of rising energy costs, preference for green products and services, and stricter climate

controls is the perfect storm that could severely affect the bottom line of businesses, if they do not act now. The green and sustainable focus is increasingly becoming evident in a number of core economic development initiatives. Amid rising public outcry, it is inevitable that the US government will have to make adjustments to business as usual, which could include taxing or setting strict caps on greenhouse gas emissions.

BACKGROUND

Historically, mankind is dependant upon only a limited number of natural resources that have been depleted, which in turn raises the value of the commodity, impacting national economies through cost and labor. With this new potential resource comes the additional promise of economic restoration, delivery from poverty, and improved quality of life. However, in an attempt to achieve this goal, green economy comes with a price, which means a tangible investment in new technologies as well as education and training. A visit to http://www.breathingearth.net/ shows the impact that countries all over the world have on climate change - in particular their CO2 emissions.

So what is the Green Economy?

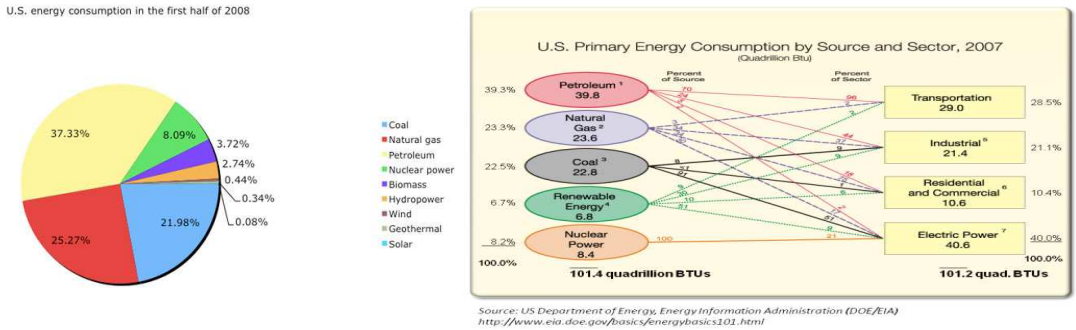
At its most basic level, the green economy is the clean energy economy, consisting primarily of four sectors: renewable energy (e.g. solar, wind, geothermal); green building and energy efficiency technology; energy-efficient infrastructure and transportation; and recycling and waste-to-energy. The green economy is not just about the ability to produce clean energy, but also technologies that allow cleaner production processes, as well as the growing market for products which consume less energy, from fluorescent light bulbs to organic and locally produced food. Thus, it might include products, processes, and services that reduce environmental impact or improve natural resource use.

Source: http://www.ncconservationnetwork.org/mainblog/topics/current-events

While our economy operates in a linear fashion, transforming energy and matter into products and services, nature operates in a cyclic manner. McDonough and Braungart in their book *Cradle to Cradle* call for a complete redesign of the product or processes. They suggest that buildings, like trees, produce more energy than they consume; factories produce effluents that are drinking water; and products be designed such that at the end

of their life-cycle they decompose and become food for plants and animals rather than ending up in a landfill, or alternatively they become high-quality raw materials for new products. Technology has evolved to a point where corporations can shrink their carbon footprints, while still improving their bottom lines.

In contrast to Globalization trends, the world is not getting smaller and energy demands will continue to grow. To meet the world's energy requirements, we will need to harness as many energy-producing technologies as possible. Political pressures on traditional energy sources such as coal, hydroelectric, nuclear, and petroleum may make alternatives more appealing to the public. As the technology gets better and manufacturing become more efficient, the per watt cost will go down. It's risky, but there is a sense that alternative energy is becoming less alternative and more mainstream. The Department of Energy estimated last year that by 2030, nearly 20% of our country's electricity would be generated by the wind— compared to 2% today—requiring about $500 billion in new construction.



Source: U.S. Energy Information Administration (via Sun Day Campaign)

Many states now require that a significant percentage of electricity be generated from wind, solar, and bio-fuels, with some offering significant economic incentives. Rust belt companies are being converted to build blades for wind turbines, and shuttered glass factories are being retooled to build solar panels.

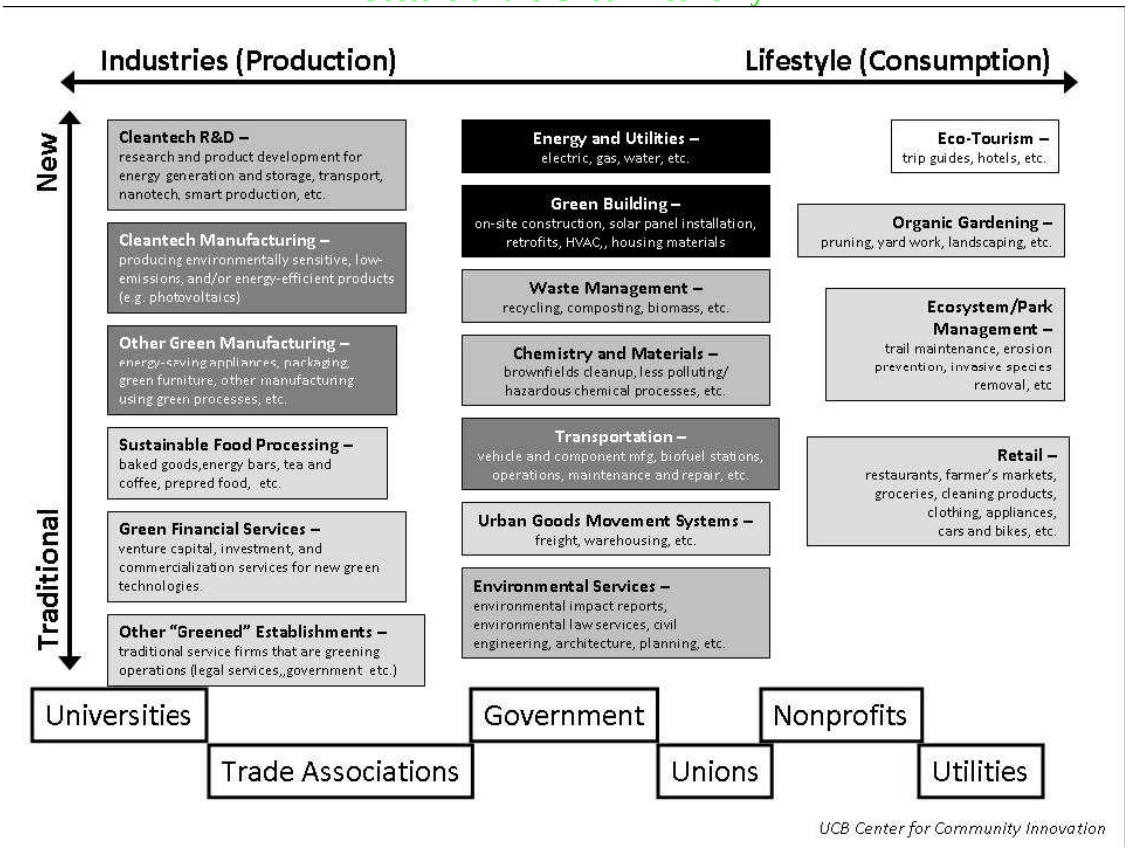
HISTORICAL PERSPECTIVE

The prevalence of the assumption that green investment costs the economy has meant that, historically, momentum for action on the environment was rapidly lost when global economic recessions hit. This was seen in 1972, when tremendous momentum for action on sustainable development was building up, a global recession hit in 1973, which quickly took the world's focus away from the environment and onto the economy. Similarly, there was significant momentum for change toward sustainable development

leading up to the 1992 World Summit on Environment and Development in Rio de Janeiro, Brazil. Again, a global economic recession hit, in 1992, resulting in significant momentum being lost. Over the last two years significant momentum has again built up for local and global action on climate change and environmental sustainability, but since the latest global financial crisis developed earlier last year, there have again been calls for economic caution on acting 'too fast' on climate change and sustainability. Unlike in 1972 and 1992, there are optimistic signs that world leaders now understand this. In November, the EU nations renewed their commitments to 20 per cent greenhouse gas reduction targets by 2020 and British Prime Minister Gordon Brown recently increased the UK target from 60 per cent to 80 per cent by 2050.

The Green Economy has been beautifully conceptualized in a report from The Center for Community Innovation at UC-Berkeley. It breaks down the green businesses into 17 categories based on a review of the various industries within the economy.

Sectors of the Green Economy



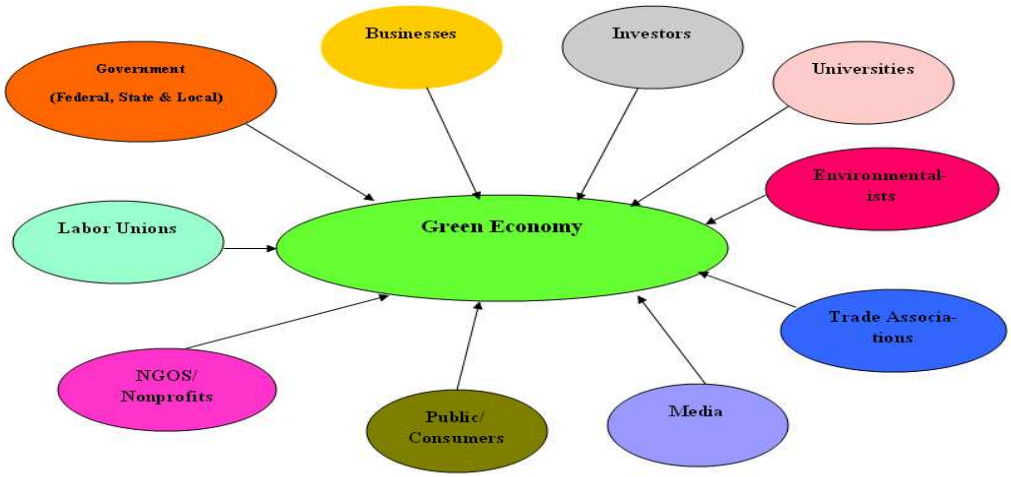
Source: The Center for Community Innovation at UC Berkeley

STAKEHOLDERS

A sustainable economy is one, which listens to the stakeholders affected positively or negatively by the present status and the future directions of the economy. Stakeholders are common interest groups intrinsic to human society, irrespective of the political regime under which they live. Stakeholders' dialogues processes can be an effective way of filtering ideas and proposals for policies and technological solutions through the social tissue. In the stakeholders' dialogues knowledge and expertise are balanced by wisdom of the non-experts.

Who are the Stakeholders?

Given a concrete situation, it is not too difficult to identify the relevant stakeholders. The success of the green economy vests with the stakeholders. It is the partnerships between organized labor, developers, corporations, environmentalists, social justice advocates and government that will define the outcome. The Apollo Alliance, a coalition of labor, business, environmental, and community leaders, seeks to build coalitions among interests that often conflict -- such as labor and business -- with a focus on meeting the needs of a green economy. Companies must tackle sustainability head on, engage stakeholders, develop NGO partnerships, and fold environmental stewardship into their corporate culture. Coca-Cola and the World Wildlife Fund tackling global water quality, McDonald's and Greenpeace hammering out initiatives to mitigate deforestation, Clorox and the Sierra Club working together on the rollout of a green product line are examples to show how corporate imperatives and environmental concerns converge with stakeholder involvement.



Government

State has a central role in stimulating the green economy. It is very critical for the success of any green project and represents the interests of the people at large. As an entity it can

introduce or amend laws to encourage efforts towards building a green economy. It has a moral responsibility to address global warming, reduce dependence on oil imports and create a new "green" economy that produces millions of new jobs. The Government as an entity includes the federal, state and local governments along with the regulators.

Consumers

Consumers are driving the demand for greener initiatives, products and services. Half of U.S. consumers say they consider at least one sustainability factor when selecting brands to buy or stores to shop, according to a recent survey by Information Resources Inc. (IRI). Most consumers are impacted by the four key sustainability features: organic, eco-friendly products, eco-friendly packaging, and fair treatment of employees and supplies. As consumers, we have to effectively use limited resources and be aware of actions which can have negative consequences for the environment and society.

Businesses

Businesses want to sell goods and services to generate maximum revenues. Businesses are engaging more and more in socially responsible activities to compete and build an eco-friendly reputation. A new study published by the Global Commerce Initiative together with Capgemini, a consulting technology company shows that companies are adapting new integrated supply chain model that "takes into account sustainability parameters such as C02 emissions, reduced energy consumption, better traceability, and reduced traffic congestion, as well as traditional measures like on-shelf availability, cost reduction and financial performance." Businesses need to provide accurate information about products and services and to follow safety standards. They should refrain from fabricating data or from making deliberate overstatements about positive “green” results.

Labor Unions

Labor Unions have a vested interest to further the cause of their constituents. Unions make sure that their rights are protected with the rapid expansion of greener initiatives. In the context of a green economy, we have unions representing the interests of both the green and non-green sectors of the economy. Their primary goal is to achieve social and economic justice through –

- enforceable labor, environmental and human rights standards in trade policies
- restore the rights of workers to form a union and bargain collectively and
- curb the use of toxic chemicals in order to enhance public health and promote safer alternatives.
- Involvement in green workforce development

NGO’s/Nonprofits

NGO's are mostly "Not for" profit organizations and interest groups work for a definite agenda with social and environmental implications. Most of them address the common concerns of the people. Most of them work with

- The Government advocating policies like the Clean Energy Corps that would put Americans to work retrofitting and repowering the country.
- Local governments, helping cities go green with robust and aggressive plans to create green-collar jobs and attract green business.
- Local communities helping leaders, organizations and communities connect with one another to become strong and smart
- Business communities to ensure success of color, low income and others from disadvantaged backgrounds.

Investors

Investors increasingly perceive firms that seek to address environmental issues as strong investment opportunities. They understand that robust demand for innovation and solutions will fuel growth, and consequently profits, for years to come. By deciding to invest in companies that are socially responsible and accountable, investors can not only realize financial gain, they can also feel they have contributed to a worthy cause.

Environmentalists

Environmental and Conservation groups work to

- reduce global warming in the timeframe necessary to avoid the effects of climate change
- expand the green economy
- end America's dependency on oil and
- eliminate social inequality

These groups believe that unbiased science should play a primary role in creating effective environmental policy.

Trade Associations

Both green and non-green economies are getting increasingly price competitive and popular. They are well organized politically as trade associations to further their interests.

Media

The media plays the key role of establishing a level playing field for exchanges between stakeholders with different backgrounds and to inform, communicate and to engage the balance of society not directly involved in the process.

Universities

Universities can set an example for their communities and the nation by implementing alternative energy, energy efficiency and environmental sustainability projects on campus

to demonstrate their feasibility and cost effectiveness. They are centers of intellectual power, capable of leading experiments on new technologies, and using these projects as teaching tools and research opportunities to better the education of the next generation of voters, consumers, politicians, and business leaders — people who will be making energy decisions for years to come.

ETHICS IN THE GREEN ECONOMY

Hazel Henderson, in his book, “Ethical Markets: Growing the Green Economy”, delivers an optimistic overview of socially responsible, environmentally sensitive businesses, investors and visionaries. Keeping an eye on the "triple bottom line" that adds "people" and, "planet" to the usual focus on "profits”, Henderson divides the ethical sectors of US economy into three areas: lifestyles of health and sustainability, socially responsible investing and corporate social responsibility. Economic and environmental sustainability depends on redressing global inequities of income and material well-being. The best long-term environment for commerce is provided by true democratic systems of governance that are based on the needs of people rather than business. Every stakeholder should think of creating a sustainable world that provides a safe, secure, healthy, productive and sustainable life for all people without putting forward their own interests. All the stakeholders should strive for a just society where the safety and health of workers, consumers and local population is respected. There should be no discrimination and no social inequality. Everyone should have access to information with transparency. The use of natural resources should be sustainable. Corporations have to be socially and environmentally responsible. Triple bottom line should be used as a framework for measuring and reporting corporate performance against economic, social and environmental parameters. Corporate Social responsibility on the part on businesses will ensure that

- legally it abides by all laws and government regulations
- ethically follows standards of acceptable behavior as judged by stakeholders
- economically maximizes the stakeholder wealth or value
- philanthropically “gives back” to society.

Investors should engage in socially responsible investing and avoid companies which have a bad reputation for ethics.

Stakeholders should realize that adoption of socially and environmentally responsible practices will lead to

- Development of new products and services
- Improvements in efficiency
- New methods of marketing
- Reconfiguration of existing business models and practices

GREEN OPPORTUNITIES

Spending on renewable and other low-carbon industries could help stimulate the economy. Energy efficiency investments **do not just save money** they also delay (and even in some cases prevent) the need to spend billions on new energy infrastructure. Energy efficiency investments also free up capital to be invested instead in even more energy efficiency initiatives and local renewable distributed supply options for energy, creating local jobs which further helps the local economy. California's energy efficiency policies created nearly 1.5 million jobs from 1977 to 2007.

ISSUES

With the global economy in a deep recession, there's a predictable debate going on: can we still afford to fight climate change and invest in a greener economy?

The green opportunities for businesses of all sizes are numerous, but it's a complex playing field that hasn't found its footing. Most companies are misleading people with false “green claims”. A study by Marketing Intelligence Service, which tracks product launches, showed that many of the products didn't live up to their hype and labeling claims were found to be inaccurate, unverifiable or simply meaningless. Part of the problem was that many of the terms being used -- safe, Earth-friendly, non-toxic, organic and natural -- had no legal or generally accepted definitions. There is no uniform standard, or set of standards, defining environmentally responsible companies thereby allowing companies to make green claims, regardless of whether their actions are substantive, comprehensive, or even true. In order to create core elements of a green strategy, Companies need to show credibility by backing up the company's performance with provable facts and figures that match its green rhetoric. Secondly, Green initiatives must make economic sense. When the going gets tough, green is the first thing to go. Companies need to show that sustainability initiatives have reduced costs and boosted revenue by creating new markets, adding new products and deepening loyalty with customers. A company needs to demonstrate that its green efforts somehow set it apart from its competitors. Apart from climate issues, a host of other issues -- the availability of water, toxic ingredients in consumer products and the rampant growth of electronic waste, to name a few will continue to affect companies and the society in the future.

As one Wal-Mart executive rightly stated, “"Corporations and institutional buyers of a wide range of products are looking upstream for solutions, asking suppliers to, variously, reduce packaging, eliminate hazardous materials, use more organic or bio-based ingredients and take other measures to green up their products and operations."
More and more suppliers are being pressed to take green action. With the clean-tech boom, companies are transforming their products, processes and performance to use more renewable energy, bio-based or lightweight materials and fewer toxic ingredients. The emergence of wide range of green business opportunities will eventually bridge the gap between green concern and green consumerism.

The current financial storm has already inflicted grave damage on the clean energy sector; shares in wind and solar power companies have tumbled in the last quarter, some by as much as 75 per cent, as credit funding for capital projects dries up and power companies cut back on their investment plans. “If you can’t borrow money, you can’t develop renewables,” says Kevin Book, a senior vice-president at the investment firm FBR Capital Markets. Last month, the largest operator of wind turbines in the US, FPL Group, slashed its 2009 capital investment plans by a third. Another US company, Duke Energy, has halved a planned $100m solar power investment. The chief executive of one Chinese-based solar cell manufacturer has even warned of panic in the sector as sales growth slows, leading to a supply glut and falling product prices. Demand for energy has slowed because of the economic crisis, pushing down the price of oil. This in turn has made solar and wind projects unattractive leading to slowdown in renewable investments.

The National Mining Association has recently expressed confidence that neither Obama nor Congress would want to implement standards so strict that they would endanger the survival of the coal industry or America's ***economy***. The NMA had previously expressed concern that it did not want to see climate policies adopted that would bankrupt the coal mining industry.

Climate change: Absolute greenhouse gas emissions grew 1.4 percent in 2007 over 2006 (the most recent data available) though it shrank 0.6 percent as a unit of GDP — the smallest annual decrease since 2002. The U.S. has steadily reduced the amount of greenhouse gases produced per unit of GDP since 1990, when the greenhouse gases per GDP were roughly 28 percent higher than in 2007, largely because of strides in energy efficiency.

Electronic waste: Despite widespread discussions in boardrooms and legislatures about the dangers of e-waste, we recycled only a tiny fraction more e-waste in 2007 than the year before, even as the amount of toxic electronic equipment entering the waste stream grew substantially.

GREEN JOBS

Green is growing everywhere as if a new ***economy*** built on ***green*** jobs had sprung like spring grass after a rain. Everyone is converging to make the ***green economy*** as forceful a driver for change as the technology revolution of two decades ago. Many states have enacted legislation designed to assist ***green*** businesses and to ensure that these employers have access to the workforce. These initiatives range from providing tax credits to biotechnology businesses for employee training to convening task forces to study the future workforce needs of ***green*** industries. A report from Association for Career and Technical Education states that in order to create such a workforce, policies need to use several key principles:

- Sustain good jobs through ***green*** partnerships. Employ energy standards as ***green*** job creation tools, promote ***green*** industry clusters, design ***green*** jobs initiatives to both save existing jobs and create new ones, link ***green*** economic and workforce development, construct ***green*** industry partnerships, and integrate ***green*** jobs initiatives into existing workforce systems.
- Make sure ***green*** jobs pay off for workers and communities by requiring that community benefits be maximized, building greener career pathways, and extending ***green*** ladders to help workers move out of poverty.

Green jobs can include anything from housekeepers who use environmentally safe cleaning products and bicycle repair technicians to workers who install solar panels, weatherize homes, retrofit factories, formulate bio-fuels, build hybrid cars, manufacture energy-efficient fixtures and appliances, or put up wind turbines.

Greener Pathways, for example, is a joint report of several groups that points out that middle-skill workers from traditional occupations will build and sustain the jobs opening up in a ***green economy***. It has called for investing $500 billion over 10 years in clean energy projects, beginning its campaign in six states (California, Colorado, Michigan, Ohio, Oregon, and Washington). Another group, the Blue ***Green*** Alliance, was started in 2006 by the United Steelworkers and the Sierra Club. Focusing on six states (Michigan, Minnesota, Ohio, Pennsylvania, Washington, and Wisconsin), it promotes investments in clean energy and ***green*** chemistry for job expansion, including fuel-efficient vehicles and ***green*** building.

Although *green* stocks and ***green*** stock exchange-traded funds are not very actively traded, green investing is finally taking off.

GREEN ECONOMY IN ACTION

Californians are already among the cleanest users of energy on the planet--without crimping their suburban, car-based lifestyle. To generate each dollar of GDP, the state emits 20 percent fewer greenhouse gases than some of the world's greenest countries, like Germany or Denmark. California has led the way in demonstrating how market-savvy regulation, instead of stifling growth, can jump-start innovation. For instance, the state has revolutionized the way utilities are regulated: instead of making profits by building more power plants, the California Public Utilities Commission links utility profits to efficiency gains--and leaves it up to the utilities to decide how to do it most cost-effectively. Pacific Gas & Electric, for example, has helped customers weatherize homes and upgrade appliances. As a result, PG&E makes more money, customers save on their bills and jobs in local service industries go up. According to a 2008 study by Berkeley University economist David Roland-Holst, California's energy-efficiency measures have helped create 1.5 million new jobs in the state since 1973.

Regulation has also been a boon for California's clean-energy startups, which have continued to attract capital despite the economic crisis. The state's renewable-energy mandates--similar to programs in Europe and Japan--almost overnight created a market with the critical scale to spur innovation and bring down costs. U.S. companies are fast advancing in next-generation technologies, such as smart electrical grids and thin-film photovoltaics.

Recently, AT&T made a major announcement that it will invest more than a half-billion dollars over the next decade to purchase more than 15,000 alternative-fueled vehicles — 8,000 vans powered by compressed natural gas, and another 7,100 hybrid passenger cars. The telecommunications giant estimates that the new vehicles will save 49 million gallons of gasoline and reduce carbon emissions by 211,000 metric tons over the 10-year deployment period — equivalent to removing the emissions from more than 38,600 traditional passenger vehicles for a year.

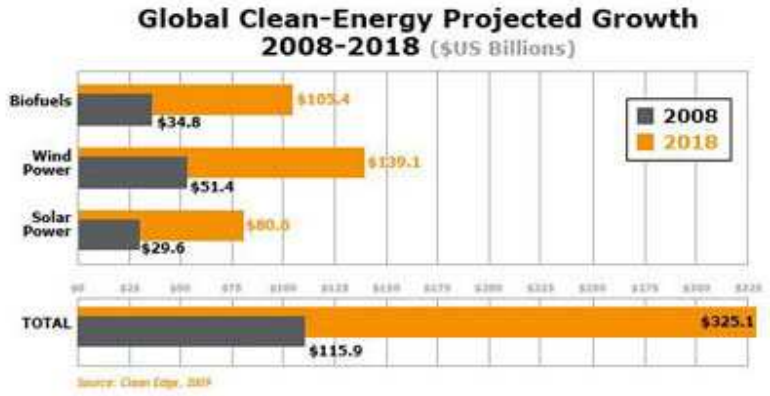
According to a study conducted by clean Edge, clean energy continues on a blistering rate of growth — increasing 53 percent from $75.8 billion in 2007 to $115.9 billion in revenues in 2008, based on their study of three key technologies: solar, wind, and biofuels. The forecast is that by 2018, these three technologies will have revenues of $325.1 billion.

Solar photovoltaics (including modules, system components, and installation) will grow from a $29.6 billion industry in 2008 to $80.6 billion by 2018. Annual installations reached more than 4 GW worldwide in 2008, a fourfold increase from four years earlier, when the solar PV market reached the gigawatt milestone for the first time.

Wind power (new installation capital costs) is projected to expand from $51.4 billion in 2008 to $139.1 billion in 2018. Last year's global wind power installations reached a record 27,000 MW. In the U.S., which accounted for more than 8,000 MW, wind

installations represented more than 40 percent of total new electricity generating capacity brought online in 2008 — and moved the U.S. ahead of Germany as the world's leading generator of wind energy.

Biofuels (global production and wholesale pricing of ethanol and biodiesel) reached $34.8 billion in 2008 and are projected to grow to $105.4 billion by 2018. In 2008 the global biofuels market consisted of more than 17 billion gallons of ethanol and 2.5 billion gallons of biodiesel production worldwide. For the first time, ethanol leader Brazil got more than 50 percent of its total national automobile transportation fuels from bioethanol, eclipsing petroleum use for the first time in any major market.



Listed below are some green initiatives at work.

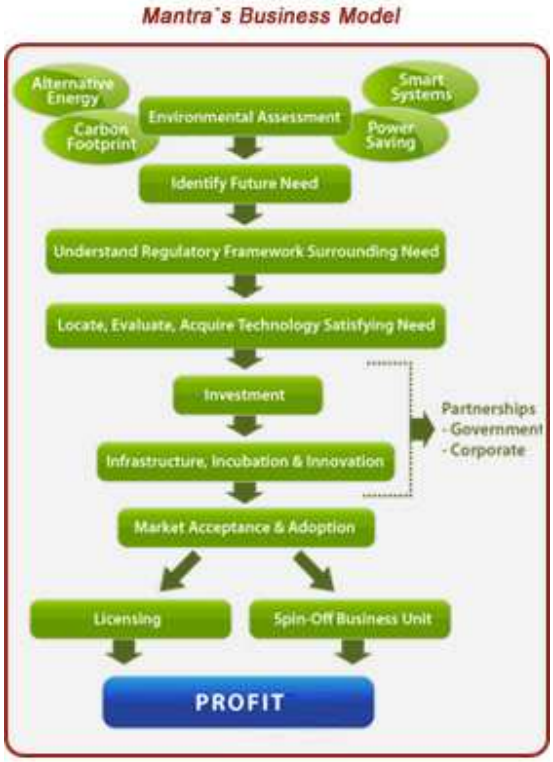
- Bank of America plans to phase out loans to companies that use mountaintop extraction as their primary means of coal production.
- Clorox has expanded its year-old Green Works line of eco-friendly cleaners, which has met with such success that the company raised its sales projections six times in twelve months.
- Coca-Cola Enterprises, the largest bottler of Coke beverages, will more than double the size of its fleet of hybrid vehicles. It will soon have 327 green trucks on the road in the U.S. and Canada.
- Underwriters Laboratories, the venerable, 115-year-old testing lab whose "UL" safety logo is on nearly every electronic item ever made — has launched an environmental testing service to help manufacturers bring credibility to their green claims.
- Heinz, Sodexo, Sysco, and Unilever are among 30 large growers, food buyers, and environmental groups that formed the Stewardship Index for Specialty Crops, a coalition to incorporate sustainability from the field to the table for specialty crops.
- Wal-Mart plans to partner with the World Environment Center to help more than two dozen suppliers in El Salvador and Guatemala improve energy and water savings and reduce waste, raw material use and emissions.

GREEN ECONOMY IN ACTION

One success story that grew out of green initiatives is a working relationship between American Apparel, a company that produces organic, domestically produced cotton T-shirts, and TS Designs, a North Carolina eco-dying facility that has patented cleaner screen-printing methods. Traditionally, according to TS Design's Eric Henry, T-shirts are dyed first using toxic chemicals and later screen printed. Henry's company buys shirts from American Apparel, adds the customer's design and dyes the clothing using environmentally friendly inks. In less than a year they have manufactured and sold more than 150,000 T-shirts.

For years, the massive Texas utility had waged war with environmentalists over carbon emissions; its plans in 2005 to build 11 new coal-fired electricity plants were a red flag in front of a bull. When TXU's stock price plunged into takeover territory and KKR and Texas Pacific Group began their bid to buy the utility, we witnessed a revolutionary approach: making environmental reputation part of due diligence. The investors consulted with the Environmental Defense Fund and the Natural Resources Defense Council alongside standard deal drills like probing the integrity of TXU's management team. The result? The buyers dropped plans for eight of the plants and agreed to cut global-warming pollution, among other commitments.

Mantra, a diversified Green Tech company aggressively targets technologies that represent the greatest opportunity for successful implementation into each of the emerging sustainability markets. Using a green business model, Mantra has been successful in acquiring a revolutionary solution to carbon reduction: the Electro reduction of Carbon Dioxide (ERC) technology.



Source: http://www.mantraenergy.com/investor/

We're using an ever-shrinking amount of energy, water, and toxic materials to produce a unit of GDP. Green building is on the rise, spurring new technologies that save energy and money while creating more healthful workplaces. There is a green race taking place in the automobile industry, with every major manufacturer planning to introduce electric vehicles. The leading consumer product makers and retailers are starting to rigorously assess the environmental impact of their products using sophisticated metrics, sending signals along the supply chain that tomorrow's products will need to hew to higher levels of environmental responsibility.

INTERVIEWS

Interview # 1

I interviewed Chris O'Connor, head of IBM Software Group Green to get his insights about the Green Economy and the role played by IBM in tackling the growing issues of climate change and rising energy costs. Recently, IBM publicized updates to its Big Green initiative, which focuses on making companies aware of how IBM's products and solutions can be used to support energy efficiency, cost containment and compliance. The Green group is responsible for building optimization strategies around the key areas of people, workloads and infrastructure, including entry points, relevant solutions, and demonstrated benefits being achieved today with IBM Software solutions. He drives the green IT strategies for IBM to address today's market realities, realities—rising energy costs; shrinking power and space capacity; increased regulatory scrutiny; and higher customer expectations. Please visit http://www.ibm.com/ibm/green/index.shtml to see IBM efforts towards green IT.

Mr. Chris identified economic efficiency as the primary driver to derive bottom line gain either in the form of saved monetary units or in terms of better reuse of assets that might postpone or push off the purchase of what might be redundant or extra assets. IBM's green efforts has focused efforts in three key areas—People, Workloads, and Infrastructure. Mr. Chris was of the opinion that worldwide there is a rush to regulate energy generation and consumption. Mr. Chris cited the European Union requirement of 20% of total energy usage to come from renewable resources. He expects many such regulations to come in the near future. Added to the regulatory aspect is the IT workload demand which is doubling every two years, driving the need for additional servers, storage and supporting infrastructure. The increased staffing is adding to the carbon footprint further driving demand from facilities like office space, power and cooling. When asked about the existence of similar regulatory controls in the US, Mr. Chris stated it as a worldwide phenomenon and pointed to new legislative measures being introduced in states like California to force energy efficiency. He anticipates the creation of a carbon credit market. When asked if the efficiency policy was voluntary or imposed by states, he stated that such initiatives were coming from both drivers.

He recalled the collaboration between IT and facilities teams, the introduction of new technologies like virtualization and optimization to achieve efficiencies. ROI (Return on Investment) is done to study the feasibility of these solutions and to determine if they contribute to the bottom line. There was discussion about the reuse aspect and how products from IBM especially, Tivoli & Rational software is used to monitor energy usage. The software has the ability to split and chargeback usages per box and run it through the build-test-deploy lifecycle. The next topic was storage. IBM is able to implement de-duplication and compression methodologies using content collector and collaborate on email using Lotus software. These solutions empower people to work remotely and bring in savings of more than $100 million dollars a year in terms of

facilities costs, from heating, air conditioning, cooling and IT infrastructure investments. Mr. Chris quoted some examples of how IBM solutions can help:

- *Reduce commuting with online collaboration and increasing work from home*
- *Reduce business travel by using online collaboration*
- *Shift workloads to underutilized servers to reduce energy and floor space needs*
- *Schedule execution of workload to off-peak hours to use lower-cost energy*
- *Effectively manage asset life cycles*
- *Optimize applications to reduce needed IT resources and energy*
- *Consolidate and virtualize to eliminate floor space and computing infrastructure*
- *Optimize HVAC for hot spots to reduce energy consumption*
- *Effectively manage your data storage needs*
- *Reduce the power consumption when workloads decrease*
- *Optimize business processes to reduce the energy footprint and costs of operations*
- *Reduce use of paper by enabling business processes to use eForms and images*

Mr. Chris was of the opinion that you don't necessarily need to go buy a completely new green portfolio. Scheduling applications, analyzing applications when they're deployed, de-duplifying data, understanding power and temperature related to what you already monitor — most clients can get started on these things if they have reasonable tooling that they already use today. IBM conducts workshops and online seminars to help point out to clients on how to get incremental benefits by leveraging existing infrastructure with their tested solutions. I was even offered to take a self-assessment for GWU to evaluate the benefits that can be achieved by deploying solutions from IBM.

Analysis from a policy perspective

IBM has taken bold steps in building eco-friendly technologies. IBM is planning on investing $1 billion a year in green IT. Achieving energy efficiency is critical for many clients and with regulation already in place, IBM is striving to make the clients realize their goals. Building “green data centers”, reducing power consumption and data center space combined with software solutions has established IBM as a leader in green IT. IBM is eyeing green opportunities outside IT such as water services, smart energy grids and even systems for making vehicle fleets more efficient. IBM has saved $100 million annually by reducing emissions and increased its emissions reduction target to 12% by 2012 from a 2005 baseline. Mr. Chris resonated that the Government has a vital role to play in this new economy and should provide a comprehensive policy which includes:

a. incentives to business in the form of tax credits to address green issues
b. provide initial infrastructure investment costs
c. introduce more eco-friendly policies and impose rigorous fines when regulations are violated
d. integrate environmental objectives into business operations

e. self-regulate for greenhouse emissions
f. make IT an integral part of any energy policy

Interview #2

I interviewed Ron Bonig, University Vice-President and CIO at GWU. He has done an outstanding job in helping to build and sustain a reliable IT environment at GW. GW's ISS (Information Systems & Services) works to research, implement, build, maintain, and improve technology to support the University's academic mission. From Internet and phone connections in offices and residence halls to software that supports admissions, online registration, payroll, and other aspects of day-to-day business, ISS provides the resources and infrastructure that make GW a better and more secure place to live, learn, teach, and work. The University has significantly upgraded its technology infrastructure and capabilities adopting the clean-tech standards. Please visit http://www.sustainability.gwu.edu/index.html to see the University efforts in action.

Mr. Ron is a staunch supporter of "Green" efforts at GWU. There is extensive collaboration between ISS and the other departments when it comes to sustainability programs. Since IT is the enabler and communication medium, most of the planning and co-ordination happens with ISS help. Mr. Ron being one of the Vice-President's of GW, he is involved in all green decision making processes. He strongly supports the urgent need to introduce legislation which will mandate energy efficiency standards. On the contrary, he makes a point that in order to implement regulatory policies, non-profits like universities should be provided initial infrastructure costs and tax incentives. Within ISS, GW has taken several steps which include consolidation of servers, building "green data centers" at Foggy bottom and Ashburn campuses, virtualization efforts, procuring energy star products, reducing heating and cooling costs by using new energy efficient devices, requesting staff to turn off lights when the buildings are not in user or during holiday periods.

Referring to the University initiatives, he said GW is committed to sustainability through strong presidential leadership and management initiatives. The creation of a new task force and sustainability office are some steps in this direction. Most campus buildings which are being renovated or under construction confirm to LEED standards and are employing green practices, including using renewable materials, wood from managed forests, low flow toilets, and carpet and paint that improved air quality. GW is converting oil-based equipment to natural gas and upgrading its energy management system. **GW** has successfully implemented the Green Move-In and Move-out programs. These programs involve the recycling ff clothing, household items, food and "e-cycling" materials, including cell phones, batteries and computer parts, on-line check in system in place of paper forms, provision for reusable grocery bags, boxes and containers. 30% of waste at GW is being recycled. Being close to major metro stations, GW has made eco-friendly commuting a priority for students, faculty, and staff. The zip car rental facility on campus has a fleet of electric vehicles. Mr. Ron spoke about the academic programs which focus on environmental and social policies. He was appreciative of the new

environmental law program and the efforts of the school of business in offering courses with sustainability focus. He commended the school for spreading the awareness about the pressing social issues, climatic changes and out dependence on foreign oil.

Analysis from a policy perspective

GW is catching up with sustainability efforts and has made tremendous progress in this direction. As with any business, GWU is looking for incentives and funding from the federal and state governments to implement green practices. As an educational institution, GW is taking an active role in influencing policy decision making on Capitol Hill. Efforts are underway to create a green IT environment and adopt sustainable policies on campus. Mr. Ron was of the opinion that the Government plays an important role in using policy to encourage adoption of beneficial technologies. Any government policy adopted should reflect the will of the nation and act to foster, through policy and funding efforts innovation in the institutions which have the potential to yield technologies and advancements leading to an energy self-sustaining future.

OIL SHOCKS OF 1973 & 1979 – POLICY RESPONSE AND EFFECTIVENESS

More than 26 years ago the first "oil shock" (1973-74) resulted in major energy price Increases, temporary and spotty petroleum product shortages, and still unresolved confusions over what quickly came to be called the energy crisis. A little more than a half-decade later the second oil shock (1979-81), although largely lacking the physical shortage component, repeated most of the elements of the first.

The research project gave me an opportunity to review the crisis, analyze the macroeconomic impact of the two shocks and of policy responses to them. The essence of the energy "crisis" is a long-term transition from conventional oil and gas to alternative primary energy forms. Between 1950 and 1973 the world oil industry grew 9-fold – a rate of increase of 10% per year, sustained over a period of 20 years. During that time period, the world produced over 2.5 billion new motor vehicles, half of which in the United States. In the 1970s, a rising fear of supply shortages began to grip the oil companies. 1973 marked the first oil crisis: the Arab oil embargo. After the Six Day War of 1967 between Israel and surrounding Arab nations, Arab countries of OPEC became politically organized to counteract the policies of the West and Israel. US policy makers recognized the threat of OPEC and the insecurity of the oil industry, namely: America's dependence on a few foreign countries; the potential to use oil as a political weapon; and the threat of rising prices. But besides a declaration of a need for alternative energy sources, US policy under the Nixon administration did not prepare for the upcoming crisis.

In response to Western support of Israel during the Yom Kippur War, the Arab countries of OPEC placed an embargo on oil supplies to the United States on October 16th, 1973. Arab countries protested the support of Israel, but also their marginalization by the global economy. The boycott caused an unprecedented spike in oil prices that initiated a global recession and inflation.

The price of oil skyrocketed from under $10 to over $100 per barrel. In March of 1974, the oil embargo to the US was lifted due to progress with Arab-Israeli negotiations. International politics and insecurity would continue to have an impact on the supply and price of oil. This shock helped ratchet oil and other energy prices to levels which could be expressed roughly as simple multiples of earlier prices. Attempts to recover higher costs of energy raw materials pushed higher prices through the system. Individuals as consumers lost real income from higher energy prices immediately and from other prices quickly, and as workers they also attempted to recover with higher wages. Governments recognized the inflationary pressures and responded with restrictive monetary policies. On top of the already existing transfer of spending power from the oil-importing to the oil-exporting countries, these policies began to reduce economic activity of the former. Growth rates dropped, unemployment rose, and the two deepest post-Depression global downturns began.

Gradually the automatic stabilizers of fiscal policy, plus some intentional fiscal stimulation and/or relaxation of monetary policy, coupled with market recovery mechanisms (including energy system structural change brought on by high prices), moved the global economy towards recovery.

The 1973 embargo sparked a number of policy changes in the US related to consumption and conservation. Price controls and rationing were instituted nationally along with a reduced speed limit to save gas and daylight savings time. The crisis also prompted a call for individuals and businesses to conserve energy, most notably a campaign by the Advertising Council using the tag line "Don't Be Fuelish." Nixon proposed *Project Independence*, which would enable the country to be energy self-sufficient by 1980, but this proposal was regarded as impossible. President Ford created the Energy *Policy and Conservation Act*, which was widely regarded as insufficient, but did create the strategic petroleum reserve (SPR) and mandated the doubling of fuel efficiency in automobiles from 13 to 27.5 miles per gallon through Corporate Average Fuel Economy (CAFE) standards. Finally, the search for alternative sources of energy ensued, further promoting the nuclear, coal, natural gas, wind and solar industries. The policy responses in the 1970s mirror the policy responses of today, namely increased diversification of energy resources and increased efficiency.

The second oil crisis to grip the world was in 1979. The Iranian Revolution sparked existing fear and anxiety in the oil market, which resulted in the tripling of oil prices in the span of months. Oil prices reached over $70 per barrel in 2004 dollars.[1] While there was never a overwhelming oil shortage, Iran represented one of the world's largest oil producing states and memories of 1973 still lingered. American companies made impressive profits due to the spike in prices, while American consumers protested.

President Carter promoted increased conservation and according to some historians poorly dealt with the crisis. Carter's policy was driven by fear of an abrupt end to the oil supply, but this was not supported by public opinions. At the end of the crisis, prices began to drop, inflation was still rising, but the OPEC cartel was loosening its hold on the world market as member states would soon begin to compete with one another. The profits enjoyed by the non-OPEC producers during the crisis proved to be too appealing.

In sum, energy policy requires long-term thinking and planning as well as fresh approaches and ideas. Legislatures in 25 states have passed laws that require utilities to meet new standards for a minimum percentage of renewable energy sources in their portfolios. City governments are enacting laws that favor the local, green economy. Local governments now realize that downtown infill development makes more economic and social sense than suburban sprawl, and they are passing measures designed to foster that kind of redevelopment. Local governments are also passing numerous laws directing government spending toward goods and services that favor social equity, local purchasing, and restoring the environment. Some local governments are also realizing the green economy investments create more and better jobs than do traditional polluting industry investments.

FOSTERING SOUND POLICY MAKING

The lawmakers should pursue policies to affect profound and positive change for both the American people and the planet. Any legislation should put in perspective the growing concerns about climate change and resource limitations and not engage in political gamesmanship. Economists and philosophers, community organizers and labor negotiators, all see in the current crisis an opportunity to create change that reaches beyond the immediate boon of a cleaner environment. Some stakeholders see new opportunities for industry or a revitalized labor movement. Others see a new role for government as a change-maker, and still others see a quantum leap in the evolution of the human soul. Van Jones, president of Green For All in Oakland, Calif., wants nothing less from a new green economy than the alleviation of poverty -- and a few other things. Solving the crisis will require a complete reordering of universities to foster collaboration across disciplines. We need to reinvent decaying societal structures and create entirely new ones. There is a need to develop national infrastructure projects that does not simply repair decaying structures, but completely redesigns roads, bridges and transportation in ways that are energy-efficient and create sustainable communities. Green policies must ensure a racially just framework for green economics to grow and flourish, without which, green economics can end up being just a greening consumption. It must ensure that new model generates much better social outcomes. Some proponents of the Green movement like Green For All argue that any federal climate legislation should include:

Maximize the gain for low-income communities and communities of color. Global warming legislation should build an inclusive green economy that provides pathways out of poverty and expands opportunity for all American workers and communities, particularly those who have been shut out of the current pollution-based economy.

Minimize the pain for the most vulnerable. Because low and moderate-income households spend a larger share of their budgets on energy and other basic costs of living than better-off households, global warming legislation should ensure that any energy price increases are offset for these households and workers, with assistance delivered in ways that also enhance energy conservation goals.

Invest in green-collar jobs. Green-collar jobs are real and are already being created across America as communities recognize that these jobs can fight poverty, pollution, and global warming at the same time. Most of these jobs are existing occupations that are being up-skilled and repurposed toward the end of building a green economy.

Limit carbon emissions at a level that science, not big business, dictates. Policies designed to limit greenhouse gas emissions and advance climate solutions must be aggressive enough to ensure that the worst environmental and economic consequences of global warming are averted.

Make polluters pay. Polluters should not be handed free permits and windfall profits. The largest possible share of money generated by placing a cost on carbon should be used

for making the investments necessary for an inclusive and fair transition to a green economy, which advances the needs of workers, communities and high-road green businesses while also saving the planet.

Ease the transition: Address the impacts of economic change for workers and communities.

A recent report from the Grantham Research Institute on Climate Change and the Environment at the London School of Economics shows the overall perception of the people towards the economy and climate.

How the proposals score

Measure	Economic benefit (/12)	Climate benefit (/6)	Total
Best			
Residential home energy efficiency	12	5	17
Public building energy efficiency	12	5	17
Boiler replacement programme	12	5	17
Light and appliance replacement	12	5	17
Fuel efficient new cars	10	6	16
Renewable heat generation	10	5	15
Renewable energy development	9	6	15
Vehicle tyre pressure checks	11	4	15
Reducing deforestation	10	5	15
Least good			
Domestic renewable energy	7	5	12
Encouraging energy R and D	6	6	12
Connected urban transport	6	6	12
Advanced battery development	5	6	11
Carbon capture and storage projects	6	4	10

Note: The measures were assessed against four economic factors - speed of impact, job creation, length of funding needed and use of available resources - and two climate factors - cuts in greenhouse gases and progress toward low-carbon economy. Other measures considered that fall between the highest and lowest scores above include smart electricity grid and meters, industrial energy efficiency, nuclear power, car fleet renewal, improved railway efficiency, and mass transit schemes
Source: An outline of the case for a "green" stimulus by A Bowen, S Fankhauser, N Stern and D Zenghelis

Overall, energy efficiency measures were consistently the top performers across all sectors, capable of delivering timely boosts to the economy, opportunities targeted to sectors with more slack, and lower emissions. They also enhance energy security and help the less well-off with their fuel bills,

STRATEGIES FOR THE GREEN ECONOMY

Regardless of the rights and wrongs, governance will play a powerful role in the energy markets over the coming twelve months. Energy markets are being increasingly driven by politics and economics, and with a global recession likely for much of this year there is little doubt these factors will play a significant role in energy issues throughout 2009. The prioritized initiatives may comprise policies, laws, regulations, plans, programs and projects. President Obama has made clear that building a new green economy will be a key policy during his term. He has pledged to spend $150 billion over 10 years to secure a clean-energy future for America. This is a wise strategic direction which could help move the U.S. out of its economic malaise, and restore its leadership on the issue of carbon-dioxide emissions reductions. Energy policy was prominent during last year's US presidential election campaign. Both John McCain and Obama declared their commitment to emission reductions and taking a leading role in global climate talks, but their policies differed markedly on the US dependence on foreign oil. McCain saw the solution as expanding drilling in the US, both on-shore and offshore and in particular in Alaska, while Obama argued that the US should be weaned off foreign oil through investing in a new green economy.

The new president will have to address several challenges to turn his vision into a success. The first of these challenges is the rate of conversion from a carbon to green economy. The US economy will always have a degree of oil dependence, as will the global economy, and the risk of rapidly ditching oil is that OPEC may see this as destroying oil demand certainty. OPEC has made clear that any demand erosion will lead to zero investment in new production that will definitely undermine a developing green economy. The President needs to maintain a sustainable balance between the existing oil-based economy and a new green economy, which is particularly important during the current economic downturn. Developing market forces will be another challenge. There are two strategic approaches that can be taken to develop a green economy: one is to shift prices with an explicit or implicit tax in order to capture the true cost of using oil and other carbon-based energy sources and let producers and consumers decide for themselves how to adapt; the other approach is to micro-manage a transition to new oil and carbon saving technologies through a mixture of mandates and subsidies.

The present administration wants to adopt a mix of taxation and subsidization, with more of a leaning to subsidies. A fairer approach would be carbon taxation, which would remove tbe need for renewable/green economy subsidies by creating a level investment field based purely on the carbon cost. The government should recognize that the solution is not the government but the market, and he should create policies to empower free market forces to develop and shape the new green economy. Changing government policies to encourage investments in energy efficiency and clean energy can also help to prevent another financial crisis from occurring. If the US had clear policies and incentives to encourage investment in energy efficiency, clean energy, fuel efficient cars and green infrastructure, this would have provided the financial sector with other areas of the economy to invest in, reducing the frenzy on sub-prime mortgage schemes for profit.

Instead of offering simply to throw money at Detroit to prop up the ailing giants Ford and General Motors has made it clear that any government support will be pegged to the industry developing higher-mileage and electric cars. Al Gore is proposing that the entire US electricity sector be de-carbonized in the next ten years.

Some of the plans drawn by the current Obama administration include:

- The creation of a cap-and-trade program to limit greenhouse gas emissions which will produce $150 billion over 10 years beginning in 2012 to finance renewable energy projects and another $65 billion a year to pay for middle-class tax credits.
- Auction 100 percent of pollution permits, meaning no sector of the economy will be exempted from paying for the right to emit carbon dioxide and other gases that contribute to global warming.
- Establish relatively aggressive emissions reductions targets of 14 percent from 2005 levels by 2020 and 83 percent by 2050.
- Approve budgets for research, weatherization programs, clean water projects, a Great Lakes restoration program and across-the-board increases for regulation, research and enforcement. and modernization of the electric grid, park maintenance, endangered species protection and renewable energy projects

The efforts by state and local governments and a handful of advocacy groups to stimulate ***green***-collar jobs is only part of the story. Venture capitalists are making significant investments in the companies that will develop the technologies behind the ***green economy***.

Griffith of Makani Power, a recipient of MacArthur Foundation "genius" grant, in his research concludes that in order to reach emissions of 450 parts per million (ppm) of CO2 in the atmosphere, we need to take the following actions in the relatively near future:

- replace the world's fleet of around 1 billion cars with small, light electric vehicles;
- create 5 terrawatts (TW) of new solar generating capacity;
- create 2 TW of new geothermal capacity;
- create 3 TW of wind capacity; and
- build 250 million new energy-efficient "green homes."

Additional measures worth noting include:

- We need to pass a renewable electricity standard mandating that 15% of the nation's electricity is derived from clean energy sources- including solar, geothermal, wind, and other renewable sources-by 2020.
- The need to pass a long-term extension of the tax incentives for generating electricity from renewable resources. Investing in renewable energy will increase our national security, create new jobs, and decrease the amount of harmful greenhouse gases that intensify the threat of global warming.

Congress has already passed bills which enhances energy efficiency, increase use of homegrown bio-fuels and strengthens the vehicle fuel *economy* standard. We need to

develop green initiatives and opportunities available in core economic development areas to innovate, prosper, and at the same time do good for our planet.

SMART GROWTH

Smart growth and green development decisions make efficient use of taxpayers' investments in infrastructure improvements and services such as police and fire. We need to focuses on protecting
natural resources while promoting high-quality, low impact urban infill development. Smart and compact growth insures us against any limits that high energy costs may impose on our ability to drive everywhere.

REAL ESTATE DEVELOPMENT AND REDEVELOPMENT

Buildings consume about 40 percent of the world's energy and materials. Buildings, more than the cars, are responsible for environmental damage. Sustainable buildings offer low operating costs, higher productivity, and better sales. Careful orientation and siting based on climatic conditions maximize the energy efficiency of buildings. Eco-friendly buildings use renewable sources of energy, have energy efficient appliances, and reduce waste while increasing the use of recyclable building materials. Employing sensitive site design techniques can minimize disruption of existing trees and other local habitat. Use of drought tolerant native landscaping reduces reliance on periodic watering, while enhancing an authentic sense of place.

HOUSING

To control costs and maximize profits, conventional builders resort to standardization and a "build and flip" mindset. In the carbon-starved future, houses built today will require expensive retrofitting to renewable sources of energy and sustainable materials, in the long run. Energy-efficient features reduce operating costs, thereby increasing the value of the house. Some builders are recognizing that green building helps sell houses to an increasingly conscientious buyer.

BUSINESS ATTRACTION

The 2007 Cone Consumer Environmental National Survey reported that 93 percent of Americans believe Companies have a responsibility to help preserve the environment, and 85 percent indicated they would consider switching to another company's products or services because of a company's environmentally irresponsible practices. These numbers are too significant for any size business to ignore and present a unique growth and marketing opportunity. Green marketing allows businesses to use commitment to the environment as a competitive edge in attracting today's well-informed and environmentally responsive customer. Wal-Mart Inc is asking its suppliers to cut back on packaging and fossil fuel consumption, and disclose their energy and carbon- emission data.

TOURISM

The primary purpose of tourism is to develop and promote an area's assets to attract new income into the economy and increase land values. Communities and resorts that value the environment can identify and promote themselves to the growing number of "eco-tourists" who yearn to experience nature.

ENTREPRENEURIAL AND SMALL BUSINESS DEVELOPMENT

For small businesses dealing in eco-friendly products, there has never been a better time. Being green provides a competitive edge over bigger non-green corporations – the tax breaks and lower utility bills are a bonus. Consumers of green products prefer and trust small and local businesses over large corporations.

WORKFORCE DEVELOPMENT

Green for All, a national organization dedicated to building an inclusive green economy, advocates for a national commitment to training, employment, and entrepreneurial opportunities in the emerging green economy for people from disadvantaged communities. Green-collar jobs involve manual work in fields that help the environment, like installing solar panels, weatherizing buildings, making bio-fuels, and maintaining wind farms.

GLOBAL MARKETS

To compete in the new world economy, America can use its current wealth, position, and influence to invent clean and green alternatives that will fuel the next green economic revolution and help America reclaim its moral ground and economic dominance.

New green standards, regulations, incentives, technical assistance, and marketing programs can help spur the green economy, but they will not actually create local economic development in the absence of supporting policies. Local purchasing and hiring requirements, labor standards, and clawback provisions will need to be part of the green economic development package if green policies are to have an impact on the economy and equity as well as the environment – and if they are to support local sustainability.

Incentivizing the cleantech sector with funding for R&D and technical assistance for startups may be the best approach, particularly at the state level. In any case, local actors will want to evaluate the match between their goals and existing resources in the community to determine what is possible. A Public strategy should build creativity and ecopreneurship incentives into standards for public-sector management. Drawing on existing strengths will not only generate more endogenous development, but also will help create a more sustainable green economy over time.

CONCLUSION

Despite the difficulties associated with energy-related climate change concerns, a concerted effort is being made by the law makers to find practical ways to realize a secure and environmentally sound energy future. Preserving the environment needs to be at the core of any business strategy. Green initiatives allow businesses to tap into customer loyalty while reducing cost and liability. The promise of a green economy is a convenient remedy to the inconvenient truth of $4 a gallon gas and looming global warming impacts. The federal government needs to take meaningful action, matching the bottom-up efforts of state and local governments, activists, and venture capitalists. US needs to strictly enact measures to contain carbon emissions, sign the Kyoto treaty and set an example for the rest of the world. Lack of effective policies will leave the American companies far behind and render them handicapped to compete in the global economy. Even worse, today's dependence on foreign oil will transform into tomorrow's dependence on foreign alternative energy technologies. As with any new economic development initiative, green economic policies will be most successful to the extent that they build on existing strengths in the city, region, or state. Existing stakeholders, from government agencies to universities, nonprofits, trade associations, utilities, and unions, need to be involved.

In short, Green Economy can be summarized as -

It is a choice.
It is a philosophy.
It is a commitment.
It is a lifestyle.
It is a necessity.
It is the present.
It is the future.

Interview Questions

IT is a strategic component of businesses to create value and drive competitive advantage. With the recent rise in oil prices, there has been a strong push to run our economy with green initiatives.

As the CIO of one of the largest higher education institutions in the Washington DC metropolitan area, how is your organization, especially the Information systems services is planning on participating in this movement towards a green economy?

2. What is your general opinion about the push for Green Economy and Green IT?

3. Do you believe in a green economy, if so why? Are your personal values, ethics and accountabilities in tune with this subject? If not, what are your reasons?

4. What are the best policy choices government can make to support growth of an economy and jobs that reduce impacts on climate, conserve energy and support higher levels of energy independence while fostering creation of jobs?

5. What initiatives has the ISS adopted in this direction?

6. Who are the stakeholders and what is their role?

7. How has been the response of the Management when proposing these projects?

8. Has there been any success with those initiatives?

9. What has been your experience in implementing these green projects?

10. Any issues or concerns you had before engaging in these projects?

11. What problems did you encounter during these implementations if any?

12. Are there any lessons learned? If so, what are they?

13. What metrics should be used to evaluate the success of these projects?

14. How has been the response of the people (including stakeholders) in general, were they receptive and optimistic about the expected benefits?

15. What factors were important in evaluating green projects?

16. Was the management buy-in easy?

17. What benefits have you derived or expect to achieve?

18. What is the future direction of green economy and green IT, Any strategies for use of sustainable resources and renewables?

19. Are you a role setter for future IT generations?

20. What is your advice to the current/next generation about the green economy and green IT in general?

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