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Weber State University Bachelor of Integrated Studies Program

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Brief summary of project: This manual will give sales representatives from Vivint Solar the needed skills to successfully navigate the technical and scientific side of solar energy.

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Why Solar

By Jordan Treasure
Chapter One
Vivint Solar

The history of Vivint started off in the pest control industry under the name of APX for one short year, but moved into the home protection industry by 1999. APX Alarm started off as a dealer for other monitoring companies, and began to create a sophisticated sales force across North America.

As APX grew through the early and mid 2000s, they began to develop into a leading competitor in the home protection industry. Becoming a leader in the industry involved doing everything in-house, including sales, marketing, installations, and the monitoring of their own clients. A marker of the company's leadership in the industry was marked by APX Alarm's signed partnership with Goldman Sachs. This allowed for exponential growth from 2006 to 2010 with an 825% increase in customer base.

This increase in customer base lead to invention, with new products being launched in the home automation industry and a rebranding as Vivint. 2gig Technologies was created by Todd Petersen to be Vivint's equipment provider. With the new focus on technology for home automation, Vivint also became interested in energy efficiency for the home. Home protection has and will always be the focus for Vivint, but with the opportunity that was seen in energy efficiency, Vivint Solar was launched in October 2011.
Currently, Vivint reports over 500,000 customers being served in North America with over 5,000 employees with a 20 million dollar monthly recurring revenue. This growth and expansion has come from one of the strongest sales forces in North America. Todd Petersen, one of the CEOs of Vivint, has often stated, “The reality is that 99% of the country doesn’t sell door-to-door because 99% of the country couldn’t handle it. Our people are very special individuals. We have the best sales and installation force in the world.”

Vivint has been able to create this sales force by creating an environment in which their employees want to work. This environment gives sales reps the desire to provide the best experience possible to their clients. Along with the environment established by the heads of the company, Vivint’s sales reps have received some of the best training available. Everything learned by the company has been incorporated into a training manual, interactive applications for smart devices, and a training program online that has given the reps everything they need to succeed.

Currently, Vivint Solar has been taking some of the top producers in the home automation and home protection divisions and transferring them into the Vivint Solar side of the company. According to Jared Slemboski, a manager for Vivint Solar in the southern California area, there is no manual being used by the sales representatives. Transfer of training information is currently conducted through word of mouth, from one manager to another and then on to their sales representatives—a less than ideal manner of communication.
I am coming to you today with a proposed solution to Vivint Solar’s lack of such a manual. I have been a part of Vivint for the last six years, having started off in Layne Thompson’s region working in the Chicago Five office. I finished as top producing first year rep in our office and one of the top producing first year reps in the region. During my second year working in the North Penn office, I finished as number eight in the region and the second largest producer in our office. My third through sixth years I took an active role in recruiting and managing as assistant manger in the mid-west region having our office finish with one of the best per-rep producing offices in the company.

Along with my real world experience, knowing the ins and outs of Vivint, I also have a Bachelors Degree from Weber State University with educational emphasis in Technical Sales, Chemistry, and Zoology. I have a plan to create a training program and manual that is needed by Vivint Solar Sales representatives. Enclosed in this proposal are two main sections that are needed by the solar division. The two sections will be from my training in Chemistry and Zoology. I will discuss also climate change and why there is a growing consumer need for the energy alternatives that Vivint Solar offers.

Upon being hired by Vivint, I will begin the process of interviewing and working with managers nationwide to compile information into a training manual and program that can be used by all reps. The first phase of the training manual will consist of the sales tactics used in the industry.
The beginning chapters will be very similar to the chapters of the training manual from the home automation side that deals with attitude, drive, heart, confidence, and holy causes, but these will be applied into specific factors of the solar energy industry. The heart of the manual will consist of a general sales cycle that the reps will be using. The later sections, which are included in this proposal, will be Introduction to Climate Change and The Zoological Effects of Climate change and how solar energy alternatives are helping in those areas.

According to Jared Slemboski, the information the current sales trainees have is very limited, and what they do have includes little information about the scientific backing of solar energy. Due to the abundance of information readily available online, consumers have become more knowledgeable about products in general. As a result, more that sales reps know about the industry, the better chances they will have at success. The information in this manual will go over a basic chemical overview of climate change, the causes of climate change in the world as understood by today's scientists, the overview of biological effects caused by climate change, and local regions where species have been affected by climate change.

The integration of this manual is very simple. "Simplifying lives" or "Simply Smarter" are two mottos heard and known at Vivint and I feel that this is a very simple way to bring the reps the information. I have much experience in the sales industry and being trained by Vivint, I feel that I would be a great asset to help with the integration of this program into the solar division. I would over see the integration and creation of this program with the assistance of the CEOs, managers, and technicians that are currently within Vivint Solar. Material that is contained in this proposal can immediately be sent to individual offices supplementing their current materials.
Chapter Two

Introduction to Climate Change

Many have talked or heard about climate change but do not know much about it or what it is doing to our planet. Being a part of a solar energy company, it is extremely important to understand how you are a part of a solution to the growing problem of climate change.

Energy has always been needed in order to survive. We have used many different means throughout time to obtain the energy that we need. Wood, oil, coal, and nuclear power are a few forms that we have recently used to obtain our energy (Rhodes 38). Currently, we use a majority of nuclear power, coal, and oil to supply ourselves with energy. All of these are used in different parts of the nation, but oil consumption is currently at “maximum demand” (Rhodes 40). Although oil is in high demand for many different uses worldwide, coal burning is also used in high volumes. The electricity that is used to turn on a light or charge a phone usually comes from the burning of coal in power plants.

Most of this energy has been obtained via fossil fuels like oil and coal. When we burn these fossil fuels, we put off emissions into the atmosphere. A few chemicals that contribute to our atmosphere are carbon monoxide (CO), carbon dioxide (CO₂), water (H₂O), methane (CH₄), nitrous oxide (N₂O), ozone (O₃), and sulfur dioxide (SO₂). These chemicals contribute to the atmosphere and make life possible on this planet. For a stable climate to occur, these chemicals need to be maintained in certain concentrations in our atmosphere. While there are other contributing factors to climate change, this manual will go over the importance of these chemical concentrations in the atmosphere.

Some of the chemicals listed are not introduced from burning fossil fuels but are introduced into the atmosphere from manufacturing other products. Ozone (O₃), for example, is three oxygen molecules that are bonded together in the upper atmosphere that help protect us from harmful infrared radiation from the sun. As we have been developing technology throughout history, we have been putting chemicals into the atmosphere that influence ozone concentrations. One chemical that we have produced has been eating away at the Ozone layer in our atmosphere.
Chlorofluorocarbons (CFLs), which are made of carbon, fluorine, and chlorine, have been made in huge amounts by humans in manufacturing. These chemicals have been introduced into the atmosphere from man made devices like refrigerators, air-conditioners, and from being used as propellants in aerosol cans. They are eating away at the ozone layer, letting more harmful radiation through the atmosphere.

Nitrous oxide (N₂O) is produced mainly from vehicle emissions and power plants. N₂O is two nitrogen molecules bonded to a single oxygen molecule. Before emissions on vehicles were a standard regulation, the nitrous oxide levels that were put into the atmosphere were extremely high. This high concentration has contributed to smog that is seen in large cities. We have definitely seen the impact in major cities that our industrialization has had on the quality of air.

Water (H₂O) which is a two hydrogen molecules bonded to an oxygen molecule in the middle, is one of the largest contributors to temperature. Water vapor is able to absorb solar radiations from the sun to warm the air around us. Water vapor is at different concentrations at different elevations. Closer to sea level, water vapor concentrations are higher, resulting in warmer weather in those locations year round, compared to higher elevations having a lower average temperature from the lower water vapor concentrations.

Carbon dioxide (CO₂) is one of the most important chemicals in regulating and maintaining temperature. Carbon dioxide is one carbon and two oxygen molecules. It is introduced into the atmosphere by the burning of fossil fuels like coal and oil that we use to power our homes and run our vehicles. Carbon dioxide absorbs solar radiation and makes our air warmer by releasing heat.

Energy will always be necessary and we will need to obtain it from one form or another. The problem that we are currently seeing is the effect that these chemical concentrations have on our climate. As fossil fuels have been used in the high amounts, we are seeing the climate patterns change. Climate change and global warming are used interchangeable in today’s media coverage. However, these terms do not mean the same thing. Global warming is just one factor that contributes to the earth’s climate change which refers to the rise in global temperature near earth’s surfaces. A main factor of global warming is the increase of greenhouse gas (GHG) concentrations.
Greenhouse gases are made up of chemicals like water vapor, nitrous oxide, methane, and carbon dioxide. Climate change is not referring to daily, weekly, or monthly changes in temperature such as a morning beginning at fifty degrees and rising to seventy degrees in the afternoon. Climate change refers to the variation of the climate over long-term periods of time. There are differences of opinion regarding climate change and whether the warming we are seeing is a natural cycle or is due to other factors. Regardless of all those opposing views, 90% of scientists that are involved with the Intergovernmental Panel on Climate Change (IPCC) agree that climate change is happening and that we have influenced factors that are contributing to the long term global climate changes being seen on our planet.

Currently, scientists have been looking at what effects the climate long term. There are many factors that contribute to climate change and some factors are not completely understood. Scientists have been finding, following, and projecting concentrations of greenhouse gases that influence temperatures. According to the IPCC, the current trends in global climate change cannot be explained without considering human contribution.
Some of the main contributing factors to climate change are chemical concentrations of greenhouse gases in the atmosphere. The reason why these gases are called greenhouse gases is because they act like a greenhouse does in a garden. A greenhouse is usually made out of glass that will allow for solar rays to pass through and provide light to all the plants. The solar rays inside the greenhouse warm the ground, soil, plants, and air. The greenhouse is sealed and does not let out any air, causing the air to be warmer than the outside temperature.

The earth has been acting more like a greenhouse because greenhouse gases build up in the atmosphere. Solar radiation from the sun comes through our atmosphere to make our planet warm enough to live on. Normally, solar rays will come to the earth’s surface to warm the planet and the concentration of atmospheric chemicals keeps the climate stable. The planet absorbs that solar radiation and then the earth will, in a way, reflect back a different infrared radiation out into the atmosphere. This radiation could be thought as “earth shine” (Berghout). The earthshine differs in wavelength from the solar rays that came to earth from the sun. The most important part to consider is that the chemicals in the atmosphere are able to absorb this infrared radiation that the earth puts off after being warmed from the sun’s radiation. Greenhouse gases have been building up in the atmosphere from our consumption of fossil fuels. The gases are not letting the earth’s infrared radiation escape out of the atmosphere as easily has they have in the past resulting in warming of our planet.
The concentration of these chemicals are much higher than in years past. "There are about 829 billion tons of CO₂... from natural sources...but a growing amount (about 230 billion tons) from human activities" (Suchocki 308). This build up of CO₂ has been evident in many ways according to the IPCC "with the recorded change in global temperature increase, ocean temperature increase, and also the loss of ice on our planet."

"Warming of the climate system has been detected in changes in surface and atmospheric temperatures and in temperatures of the upper several hundred meters of the ocean. The observed pattern...is very likely due to the combined influences of GHG increases and stratospheric ozone depletion. It is likely that increases in GHG concentrations alone would have caused more warming than observed because volcanic and anthropogenic aerosols have offset some warming that would otherwise have taken place". (IPCC 39)

Our progenitors have not had much of an influence on atmospheric chemical concentrations. In fact, it wasn’t until the industrial revolution when we began to see dramatic rises in chemical concentrations in our atmosphere from mass manufacturing. The resources that we have been using to create new technology has given us the opportunity to change how we evolve into the future. There are many other alternative energy solutions out there and Vivint Solar is just one piece of the large pie that will help combat global climate change.
Chapter 3
The Zoological Effects of Climate change

Where an animal lives, including everything that is around them makes up their habitat. There are many different types of habitats across the world as well as many influences that go into whether or not a species does well in its given habitat. To find this out, we have to look at what is around them that influences how the species lives. Everything that influences how they live and survives is called an ecosystem. An ecosystem is an environment in the world where many species of animals, plants, and microorganisms live together benefitting off of each other being there. Along with the diversity of plant and animal species there are nonliving factors that influence an ecosystem like types of soils, air, water, elevation, and climate.

There are many different types of ecosystems each are in a unique balance with variables go into making the ecosystem. When one part of the ecosystem is altered by outside factors like humans, it is not only one part of the ecosystem damaged or hurt, but the whole ecosystem can be affected by that one factor being changed. The coral reef ecosystem is a great example of how one part of an ecosystem can be damaged, which affects almost all of the species that live near it. Many people think that the coral reef is a nonliving entity when in fact, reef is a living, growing organism. The coral reef plays a major role in an oceanic ecosystem by helping support upwards of “25% of the oceans species” (Famdon 35).

The coral reef is formed by coral secreting calcium carbonate to create a skeleton, while the flesh of the coral reef is formed by polyps that grow on it. Polyps are little tiny organisms that are the start of the ecosystem that is centered around the coral reef. The coral reef is similar to dirt in a field we use to plant on. The coral reef gives a good foundation for many different types of vegetation to grow, especially algae. The coral reef gives the algae a place to grow and the alga provides a food source for the coral reef. The alga also provides many different species a food source. With smaller species having a food source, many other species of plants, animals and microorganisms are able to live and make up the rest of the ecosystem. There are many different smaller species of fish and sea urchins that are herbivores that eat the algae. These smaller animals then provide a meal for other medium sized predatory species. Animals like squid, octopuses, sea slugs, clams, and flatworms are some of these predatory species.
These medium sized species can then be meals for larger predatory species like sharks and other animals. The overall existence of the coral reef provides a necessary habitat for many different species in the ocean. According to Fandom, because of the small size and the limited locations of the coral reef compared to the size of the ocean, there is "no other" environment in the world that is like the coral reef ecosystem (39).

With the global warming we are currently seeing, there is an "increase in ocean temperatures" in addition to the ocean becoming "more acidic" (IPCC 52). The increase in oceanic temperatures and increased ocean acidification is causing corals to bleach. The "bleaching event" is caused by the loss of algae on the corals due to the increases of temperature and acid levels in the ocean (Buddemeier 1). It is referred to as bleaching because the normal coloration that comes from the algae on the coral dies and turns white. This was seen in many different regions of the world that have coral reef ecosystems and these ecosystems have seen many different occurrences of coral bleaching. The loss of algae impacts the coral because the coral loses its food source. When the algae dies, it causes a chain reaction to occur to the rest of the ecosystem. The coral no longer has a food source from the algae; the algae that the smaller herbivore species would eat no longer have a food source, all the way up to the large predatory species that are affected by the algae loss.

Some parts of the ecosystem are affected too much by the loss of algae. While there are many species that can move to a different location, there are some species of animals that are not able to survive the coral bleaching. The effect of climate change is seen in many different types of environments and ecosystems. We are able to see that by changing one aspect of an ecosystem has far reaching consequences that were not intended. We are beginning to see species disappear off the earth as we have impacted parts of their environment with climate change. Like what we saw with the coral bleaching, not just one species disappears, but many other species are also influenced by one of a few aspects of the ecosystem.

If you have lived in different regions of the country, you have seen the different vegetation in the Midwest, heard the different insects of the south, or tasted the heat of the desert climate in the west. There are many different areas to live and some species of plants, animals, and microorganisms do better in some areas than others.
With climate change rearing its head in all ecosystems, we are beginning to see how it is affecting many different species in different environments. In some cases, there may be species we may not be able to help before it’s too late. We have looked at an oceanic environment, but looking at a terrestrial environment we can also see climate change has affected species such as lizard populations. Lizard thinning and extinction is happening in many different tropical environments due to climate change. Virginie et. al. 2012 has done a study with lizard species around the world and have found that populations of lizards are decreasing while other species are going extinct. Lizard, which are heliotherms, need light in order to maintain a stable body temperature. Lizards, just like in a cage, will spend time basking in sunlight at different times in the day so they are able to forage and provide the needed nourishment to survive. What is currently happening with climate change in these higher elevation areas is an increased surface temperature. The surface temperature is making it harder for lizard populations to forage during the hotter parts of the day because the lizards are spending more time in the shade so they do not overheat and die. Like anything that is malnourished, these lizard populations are seeing physiological effects causing the population size to decrease. Some have already succumbed to the hotter temperatures and have become extinct.

We are seeing effects on many different environments that are making it more difficult for species to maintain normal life in the ecosystem in which they live. We have discussed the oceanic environment of coral reef, the hotter, higher elevations in the desert, but there are many different environments that are effected by the far-reaching arm of global climate change. In Northeastern Europe, we are seeing climate change affect the winter landscape. There have been warmer winter months, which has been changing the winter season’s landscapes. Having the warmer winter months has caused the landscape to go from snow covered, to a dark, dreary, and muddy landscape. The Tawny owl species has been predominantly a grey color, but as the species has seen the less snow covered seasons the species is now becoming a brown color that is working better with the landscape and it is proposed that the climate change has driven this change in Tawny Owl population.

This form of selection between the Tawny Owl colors has been seen and studied for a long time. The phenomenon is referred to as natural selection, which was coined by Charles Darwin. The theory of natural selection proposes that there are traits of species that are preferable for survival over other traits, and these traits will be selected naturally.
In the case of the Tawny Owl, the warmer temperatures made it so the brown owls could hunt better and not been seen by is prey in the warmer winter months. The grey color was extremely good in the snow-covered areas, but now it is not as preferable because its prey is able to spot the uncamouflaged owl. This allows for the brown colored owls to do better and outcompete the other grey owls. This coloration difference could influence many factors of the ecosystem. From an increase in the brown Tawny Owl’s hunting, its population could grow and then diminish the population of the species it feeds on.

We have seen the effects of climate change on many species populations and there are numerous other examples around the world. This is something that we need to take into consideration as a species. There are many species out there and our actions on this planet have and will continue to influence other species around us. Listed below are brief descriptions of other specie populations that have been effected by climate change.

“The deleterious impacts on biodiversity could be even greater if the range and activity of the chyrid pathogen is being further increased by global warming”. “Implying that it may continue to cause many additional amphibian declines and extinctions around the world” (Lauranc 8).

“As can be seen, both genera will suffer a loss of habitat with very little new habitat arising to offset this. This loss is due to the effects of climate warming on individual time budgets (see below), which in turn affects the number of individuals that can live as a socially cohesive group at any one location. If this value falls below the minimum required at a specific location, apes will no longer be able to live there” (Lehmann 2223).

“One potential effect of winter warming is a change in seed production as a consequence of a change in flowering phenology and/ or a direct decrease in flower production” (Shucun 427).

In conclusion, I hope these two sample chapters would prove helpful to the current and future sales representatives at Vivant Solar. I believe that both the information on the chemistry of climate change as well as the insight into the ecological ramifications of said chemistry will aid the reps in their sales pitch to potential Vivant Solar customer. Upon getting hired, I can aid those at Vivant in the completion of a full training manual and supplementary training program.
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