**Case Analysis #1: Climate Change and the Electric Car**

**Introduction**

There are certain *competencies* essential to sustainability education, but they are not the focus of traditional educational programs at colleges and universities. What is meant by *competence in sustainability?* If you have *competence in sustainability*, it means that you have the knowledge, skills, and attitudes necessary to successfully solve real-world sustainability problems. Five specific competencies have been identified as important to a sustainability education: *systems thinking competence, normative competence*, *strategic competence, anticipatory competence, and interpersonal competence*.

*Systems thinking competence* is the ability to see a situation or problem holistically; for example, being able to link issues in the automotive industry to the ecosystem, society, and the economic system. *Normative competence* is the ability to recognize people’s values, preferences, and beliefs, which influence the decisions they make; for example, being able to recognize how people’s values, preferences, and beliefs influence their decisions about what foods they prefer and how much they are willing to spend on these foods. *Strategic competence* is the ability to collectively design and implement strategies to redirect current systems towards a sustainable future state by recognizing barriers to change, how to overcome those barriers, and anticipating unintended consequences. In other word, it is the ability to ‘‘get things done’’ so that the current system becomes a more sustainable system in the future; for example, being able to identify specific practical strategies that a non-profit organization aimed at reducing poverty should implement in order to achieve this goal. *Anticipatory competence* requires imagination and is the ability to identify possible future scenarios (pictures of the future) and to predict unintended consequences of actions taken; for example, in the 1950s exponentially increasing global populations meant that we needed to produce more food. Three possible future scenarios are: no action is taken and people starve, population stops growing exponentially and we don’t need to increase food production, we develop technologies that allow increased food production. During the Green Revolution of the 1950s, action was taken to increase food production by using synthetic fertilizers and pesticides, irrigation systems, and high yielding monocultures. The unintended consequences were pollution, groundwater depletion, and biodiversity loss. *Interpersonal competence* is the ability to motivate, enable, and facilitate collaboration among diverse stakeholders using “people skills”; for example, a community leader might use empathy plus good leadership, communication, and negotiation skills to successfully bring together environmentalists, tribal leaders, and the mining industry to compromise on how public lands should be used sustainably.

 **Instructions** The purpose of this exercise is to determine your current ability levels for the five key competencies described above, and is part of a research study about education for sustainable development for students taking the SOS 110 course. Please read the following hypothetical scenario and *answer the twelve questions at the end of the scenario*. Use the space provided after each question to write your answer to each question. For each question, identify as many points as you can. Your *grade for this assignment is based on effort only; there are no perfect answers*.
 **Scenario** The 2007 Intergovernmental Panel on Climate Change (IPCC) scientific report declared that it is very likely (90 – 99 % probability) that the lower atmosphere is getting warmer and that human activities are responsible for most of the recent temperature increase and will be responsible for most of the larger increases projected for this century. The consequences of climate change are many and include severe droughts, increases in extreme weather events, sea level rise and biodiversity loss. These changes will impact many vital human activities, ranging from agriculture to water supply to human health. Climate changed is caused by the addition of greenhouse gases to the atmosphere. The most abundant greenhouse gas is carbon dioxide (CO2). One solution to climate change is for humans to stop or reduce the amount of CO2 that they are adding to the atmosphere. The human activity that adds the most CO2 to the atmosphere is the burning of fossil fuels, such as coal, oil and natural gas. Fossil fuels are used to heat our homes, power our cars and airplanes, and are used in the production of many petrochemical products. Oil is one of the three major fossil fuels and is refined to gasoline, which is used as fuel to power our cars. Of all the CO2 added to the atmosphere through human activities, gasoline used in transportation adds about 20 % of the total. One proposed solution is the use of electric cars, which do not use gasoline.

A nonprofit citizen activist group, *Citizens for Electric Cars*, is interested in promoting the electric car. Their action plan is to influence all important stakeholders, such as consumers, governments and the automotive industry, so that electric cars will soon dominate the roadways. The following are the specifics of their plan:

* Educate consumers so that they will want to purchase an electric car rather than a gas powered vehicle. They would like consumers to understand how their choice to “buy electric” will benefit the environment and human health.
* Address common misperceptions about electric cars. For example, some people believe that electric cars will not get them to work and back due to the short battery life. In reality, the average distance that electric vehicles can go on one charge is upwards of 60 miles. The average person drives 29 miles on workdays.
* Lobby the government to provide subsidies and other incentives for people to purchase electric cars. For example, the federal government currently provides a $4000 subsidy to consumers who purchase an electric car. However, it provides a $100,000 tax credit to a business who purchases a Sport Utility Vehicle (SUV).
* Convince the auto industry that electric cars will be marketable and, therefore, profitable. For example, the auto industry thinks consumers perceive electric cars as too small and unsafe compared to an SUV, not a “cool” car to drive and too expensive. In reality, consumer who have driven electric cars in the past think they are “cool, fast and sexy,” reasonably priced and more convenient because you plug them in at home rather than having to stop at a gas station.

*Citizens for Electric Cars* believes that, even though gasoline powered vehicles currently dominate the automobile market, their efforts will result in roadways dominated by environmentally friendly electric cars.

**Questions:** There are 12 questions on the next few pages.Use the space provided after each question to type your answer to each question. For each question, identify as many points as you can. Use as many pages as you need to answer the questions. Your *grade for this assignment is based on effort only; although you must answer all 12 questions, there are no perfect answers*.

**Q1**: Identify all possible social, environmental, and economic challenges represented in this scenario of moving from gasoline-powered vehicles to electric cars.

**Q2**: Prioritize the challenges that you listed in Q1 in terms of the ones *you think* might be most relevant/important to achieving sustainability (Two challenges may hold the same position on the list).

**Q3**: Identify the values that underlie the non-profit’s strategies. In other words, what values seem important to this organization?

**Q4**: Do **each** of the values that you identified in Q3 align with sustainability? **Why** or **why not**?

**Q5**: Identify conflicts between the social, environmental, and economic priorities you identified in Q1.

**Q6**: Where might the non-profit have to compromise their values (identified in Q3), making a trade-off, in order to achieve their goal of electric car domination of roadways?

**Q7**: Suggest strategies that the non-profit could use to resolve the conflicts between the social, environmental, and/or economic priorities that you identified in Q5 while still supporting sustainability through these strategies.

**Q8**: Why did you suggest the strategies that you identified in Q7? In other words, why do you think these strategies will be successful?

**Q9**: Identify possible future scenarios. In other words, what might the future look like if no action is taken and gasoline-powered cars continue to dominate the roadways or if the non-profit succeeds and the electric car begins to dominate the roadways or if some other actions are taken as based on the strategies that you identified in Q7?

**Q10**: What unintended consequences to social, environmental, and/or economic systems might occur in the scenarios that you identified in Q9? Unintended consequences are the unanticipated or unintended outcomes or results of some action, and they can be harmful or beneficial.

**Q11**: What types of interpersonal skills will be needed by the citizens in the non-profit group in order to effectively work with the diverse group of stakeholders involved with this issue? In other words, what “people skills” will be needed by citizens in the non-profit group to motivate, enable, and facilitate collaboration among diverse stakeholders?

**Q12**: Why will the interpersonal skills that you identified in Q11 be important for successfully working with a diverse stakeholder group?