Précis

# A United States Sustainable Energy Transition Based on Successful International Models

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We, the global community, find ourselves at a pivotal time in the history of mankind. Citizens and governments today have the responsibility of addressing the issue of climate change knowing that the result of their actions today will continue to affect life on Earth from this point forward. The United States would play a pivotal role in establishing sustainable economic and political behaviors throughout the world, yet we have been slow to change the status quo in the American energy industry. The problem is known; climate change is a real and imminent threat to the world. The question that I address in the subsequent research paper is – What conditions will lead to a more effective energy transition in the United States?

My search for successful energy transitions led me to Germany, Denmark, and the Netherlands which have transformed their energy industries and are working towards ambitious goals for clean energy consumption. These three nations served as models for my research. I evaluated each nation's energy transition and related them to the United States based on economic, political, and social conditions.

Based on the similarities and differences I found between the model nations and the US, I developed recommendations for our country to achieve their own energy transition.

The first recommendation refers to the political culture in the United States. The political atmosphere in the US is far more stratified than the systems of my European models. This led me to the conclusion that states would be more effective conductors for energy transition than the federal government. State-led green initiatives would also result in a diverse energy market, which is often considered an economic strength.

I found that the social conditions in the model nations were more hospitable to drastic energy transitions; the citizens of these nations almost unanimously supported the government's green energy policies. The US does not enjoy undivided support for an energy transition which means that this country needs to implement an incremental transition. Our government cannot expect to be successful if they force drastic lifestyle changes on its citizenry.

The economy and business atmosphere in the US closely reflects the social culture. There are many economic interests that would be destroyed if the US conducted an energy transition like Germany's. Therefore, this nation needs to support sustainable investing which will provide a necessary boost to green technology, industry, and research. With the right financial support, renewable energy technologies can become as economically appealing as conventional energy, which will lead to widespread public acceptance and enthusiasm for a sustainable energy transition. This research does not "reinvent the wheel" rather it offers valid, implementable solutions for dealing with a major global threat. The relative simplicity of these recommendations also make them adoptable immediately with adequate support.

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## Introduction

This research[1] looks to make sustainability the cornerstone of development in the United States, the world's largest economy and third most populous nation. Sustainability can be briefly defined as the ability of a system to survive and function indefinitely. Similarly, sustainable development is the responsible consumption of resources to meet growing demands of the human population without jeopardizing the availability of such resources for future generations (Bates 1994). As climate change becomes an increasingly pressing issue, many nations have begun implementing sustainable development plans which call for drastic changes in the way societies operate and consume energy.

Such drastic changes call for a well-managed transition in the political and economic sectors leading to sustainable development and governance. This research covers three "model nations" that have begun sustainable energy transitions and are currently world leaders in alternative energy development.

Germany, the Netherlands, and Denmark will be the model nations that lead this discussion and serve as examples for the United States. The techniques adopted by the model nations in their sustainable energy transitions and the necessary conditions for an energy transition, as determined by policy research, will be applied to the US and will prompt recommendations for sustainable action in US markets.

## Keys to Transition Management

### *Long-Term Mindset*

The most important key to successful transition management is understanding the importance of making decisions that have positive results in the long-term. Currently, most political and economic decisions are made to produce positive results very quickly and this myopic view has been detrimental to the progress of sustainable development.

Consumers and constituents want changes to have a conspicuous impact immediately and this causes policy makers and business leaders to focus on the short-term. For example, businesses make decisions that can positively impact their shareholders or increase stock value. Often, these decisions are made with little or no regard for the environmental impact the business is having. Likewise, politicians may find that they cannot look past the next election and act in a way that they think will allow them to maintain their position. This mentality may lead them to focus on non-polarizing issues or create policies that favor big campaign contributors. As climate change becomes a widely discussed social justice issue, business leaders and policy makers have begun taking a more long-term view in-making and realized that short-term focus is not sustainable for good business and does not meet the demands of the public. The Netherlands adopted this changing mind-set when they developed their energy transition and were seeking "multidisciplinary research that will contribute to a long-term transition to the more sustainable use of energy and resources…" (*The Hague* 2009). A long-term mentality is the base of all transition management, which is an incremental process. Leaders need to concede that the results may not be immediate in a sustainable energy transition, but their effects will be far more enduring than frivolous temp policy. This also means that leaders need to develop policies that are part of a purposeful evolution, not just one-time changes. For example, carbon cut policy should establish that a certain level of reductions need to be met each year as opposed to one large standard that needs to be met in two decades. Policy should create a change in behavior and as the nation works to achieve a modest goal each year a trend of sustainability could develop. Policies that aim to cut carbon emissions by the year 2030, for example, do not encourage the idea that sustainability is an on-going process.

*Resilient Political Conditions*

The concept of having a long-term mindset and enduring regulations brings us to another major key in transition management: the need for resilient political conditions. There are constantly changes in political personnel in the United States and around the world. Changes in personnel invariably lead to changes in policy which disrupt the process of long-term transition management. Therefore, the coalitions that lead a sustainable energy transition need to be stable in order to stay on track and accomplish the goals of the transition (Kern and Smith 2008). The trend in the Unites States is thus; when a new governor or president comes into office they try to implement their own policy for everything from education to healthcare to action against climate change. As they seek to implement their own policies, old policies are often pushed aside, modified, or terminated. This leads to inconsistent progress when sustainable energy transition calls for steady progress. The conclusion is that sustainable energy transition policies need to be determined then implemented through a coalition that is not controlled or manned by the political group in power at it conception.

*Collaboration across Interests*

In fact, another key to successful transition management is collaboration and interaction between all sectors. The persons leading the sustainable energy transition need to be a diverse group that represents many different interests. Perhaps the coalition for transition does not need a political leader affiliated with the leading party, or any political party for that matter. Again the Netherlands provides an example of collaboration and variation in a sustainable energy transition. When the nation was beginning its research program for a sustainable energy transition it wanted to encourage collaboration and felt that the lack of collaboration between businesses, "knowledge institutions," and government agencies was a hindrance to the transition process (*The Hague* 2009). We will take a more in-depth look at the practices developed by the Netherlands as a result of this search later in this research. The key takeaway is that a transition in the energy sector affects all other institutions and industries; therefore, these different parties need to work together to find common ground and achieve each of their goals through a comprehensive plan.

*Equilibrium Shift*

The final key to transition management is reaching the "tipping point," which begins the process of shifting an equilibrium (Aklin and Urpelainen 2013). The current equilibrium in the energy sector depends on a balance between carbon emitting energy and economic growth. A sustainable energy transition will strive to shift this equilibrium by decoupling economic growth and greenhouse gas emissions (Meadowcroft 2009). In order to achieve this shift alternative energies will have to combat conventional energy and become economically attractive. A "lock-in" of conventional energy has occurred, meaning that economics and politics are dependent on the production and distribution of fossil fuels. The lock-in is described as follows: the fossil fuel industry got initial investments which lead them to be successful because of innovation and research and development that makes them affordable. Their affordability makes them the preferred type of energy consumption and technology is developed with fossil fuels as the primary mode of energy. This leads to more investments into the fossil fuels industry which allows for more innovation and affordability creating a cycle that continues along this vein (Dangerman and Schellnhuber 2013). A sustainable energy transition is then presented with the difficult task of breaking the lock-in and creating a new equilibrium.

## Model Nation Characteristics and Policy

Keeping the key elements of transition management in mind, we will now look at three model nations that have implemented their own sustainable energy transitions. Each nation has a slightly different plan for its sustainable energy transition and will provide a variety of potential avenues of policy making to apply to the United States. The nations have been selected because they are leading the world in sustainable development and have stability in their economies and politics similar to the United States.

### *Germany*

The past decade has defined Germany as one of the most vital cogs in the international policy machine after it held the Eurozone together through recession and bailouts. The nation continued to establish itself as one of the world's most progressive leaders when it began its sustainable energy transition. This transition has two main parts: nuclear energy phase-out and renewable energy advancement. The phase-out of nuclear energy was prompted by Japan's Fukushima power plant disaster after which Germany almost immediately closed the older half of its nuclear power plants (Schlandt 2015). The nation also made plans to close the rest of the nuclear plants by 2022 to complete the phase-out. By closing nuclear power plants, Germany could then turn to developing its renewable energy sector.

Starting in 2000, Germany introduced feed-in-tariffs for renewable energies. In recent years the amount of renewable energy available in Germany has significantly increased, especially the presence of photovoltaic systems and onshore wind farms. As a result, in the year 2013 approximately 25% of gross electricity consumption in Germany came from renewable resources (Frondel, Sommer, Vance 2015).

Many critics have argued that this transition is putting a burden on the German population. Their argument is valid in that the price of electricity in the model countries, especially Germany and Denmark, is notably higher as they transition away from fossil fuels. However, it is due noting that Germany is the fourth largest economy in the world and has maintained a strong enough economy to survive and succeed through the recession of 2008. Furthermore, reports claim that there are more jobs in Germany in the renewable energy sector than in the conventional energy sector (Morris, Phent 2012). Therefore we can assume that the economy in Germany has not be detrimentally affected by the energy transition.

Goals outlined by the *Energiewende* include; cutting energy consumption by one-fifth and replacing 80% of electricity currently generated by conventional sources with renewables by 2050 (Sonal 2013). Germany also intends to have 40% of its gross electricity consumption to come from renewable sources by 2020 (Morris, Phent 2012). These goals are mostly going to be achieved by the use of solar and wind energy. Though ambitious, these goals have brought renewables to the forefront of international conversation and Germany has made renewable energy development a source of international competition. This type of competition is good for renewables as other EU countries feel pressure to expand their renewable development to keep up with the progressive action by Germany. Germany's progress in renewable development has put pressure on its neighbors both politically and financially. Politically, *Energiewende* has encouraged neighboring countries to develop more sustainable energy practices. Financially, the German transition has strained neighboring countries. Since Germany has developed significant solar and wind farms there are days where the domestic supply of energy does not meet the demand – this mostly occurs on particularly windy or sunny days. When there is a higher supply than demand in Germany, the excess energy becomes a cheap and appealing import for neighboring countries. This has a negative impact on the energy producers in these countries and has reduced exports for neighbors such as Poland and the Netherlands. The positive takeaway of this overflow is that power prices in Central Europe have been pushed down. The negative takeaway is that this could lead to the disintegration of the European energy market because many nations have begun developing technology to prevent the outflow of Germany energy to their domestic energy grids. (Schlandt 2015). While international energy integration would not be a huge problem for the United States as its energy grid is significantly larger and more isolated than Germany's, the struggles faced by *Energiewende* can be learned from and inequity between supply and demand is a common problem with renewable energies. Germany's transition teaches us that the energy sector demands diversification.Furthermore, public support is tremendously important to implementing a sustainable energy transition. 92% of the German population encourages renewable energy development (Morris, Phent 2012). This type of support from the citizens of a nation in transition greatly facilitates the process as policy can be implanted faster and accepted without legislative gridlock.

*The Netherlands*

The Netherlands' policy seems to be the most similar to the energy circumstances in the United States since the Dutch are very focused on creating a diverse, competitive, and sustainable energy sector. The Dutch government is a large stakeholder in the natural gas industry and the nation has lots of oil and natural gas refineries. Due to these ties to the fossil fuel industry I feel that the Netherlands is more relatable to the United States whose economy is intertwined with the fossil fuel industry.

The numerical goals for Netherlands' sustainable development include a 17% $CO_2$ emission reduction in the transportation sector by 2030 and a minimum 40% reduction of greenhouse gas emissions by 2030 (an EU-wide standard). Overall, the nation aims to have 14% of final energy consumption come from renewable energy sources by 2020. The Energy Transition Process (ETP) in the Netherlands focuses on six main themes that coincide with these goals: (1) new gas, (2) chain efficiency,(3) sustainable mobility, (4) green resources, (5) sustainable electricity, (6) built environment (Netherlands 2014). New gas is the development of efficient and green natural gas use as well as innovation in the science of carbon capture and storage (CCS). Chain efficiency is the improvement along production and supply chains for natural gas and oil. This aims to reduce emissions in the production chain. The themes of sustainable mobility and sustainable electricity involve creating commercially viable clean transit and electricity such as electric or hybrid cars and the use of wind or biomass energy for the generation of electricity. Green resources is simply more responsible use of raw materials. Lastly, a built environment is the conservation of energy demand for heating and cooling in buildings – Denmark serves as a more developed example of this technology. The Dutch plan exemplifies diversification in the energy market as it addresses ways to improve the efficiency and sustainability of some fossil fuel technologies as well as develop more comprehensive alternative energy sources.

Another unique facet of the ETP is that businesses are the dominant actor in this transition. The transition is led by the Ministry of Economic Affairs and coalition seats are held mostly by business leaders, as well as an NGO representative and some government officials. This can be a double-edged sword as it is important to have business leaders involved in a sustainable transition because they can provide investment finance and/or have control over parts of the energy sector. However, if businesses are given too much control over the transition then they can manipulate innovation and learning in their favor. For example, the CEO of Shell Netherlands is the head of this transition task force and many people believe that this will allow Shell to maintain the current energy regime that is centered on fossil fuels (Kern and Smith 2008). Although this is a valid concern, the Netherlands has introduced an interesting idea in which sustainable transition can bring together government and business. The financial power of business is key to funding a successful transition, providing opportunities for alternative energy to break the lock-in pattern, and implementing policies that are accepted by everyone as they help many stakeholders achieve their goals.

The Netherlands ETP has created a system of experimentation in which sustainability paths are approved by the Ministry of Economic Affairs. These sustainability paths allow for the creation of transition experiments. The Netherlands has been conducting experiments since 2005 in which sustainable innovation is tested on a small scale before it is applied to a broader spectrum. The benefit of this is two-fold. By conducting these experiments on a small scale the coalition is able to reduce risk and potential loss. If a project fails in the experimental phase then it will be changed and retried before it is applied to a larger industry or at the national level. Furthermore, by testing theories on a small scale the public is able to see success sooner and will therefore encourage broader application. This method sates the public's appetite for short-term results. The best experimental example is that chain efficiency savings tests were applied in the Dutch paper industry before being applied to larger or riskier industries (Kern and Smith 2008). The method of experimentation is a good way to reduce risk, reduce potential loss, and gain public support or investors after successful experiments are completed.

*Denmark*

Denmark has many of the same goals as the Netherlands and Germany in terms of increasing the production of renewable energy and implementing a sustainable energy transition. However, the Danish Energy Agency (Energiestyrelsen) has brought forth the most comprehensive plan of these three model nations. The breakdown of this Energy Agreement will come after pointing out the fact that this legislation received 95% support from Parliament (Danish Energy Agency 2012). This is an important feature of how sustainability is approached in Denmark and exemplifies the nearly unanimous support that the nation has for developing sustainably. The US has very divided opinions on sustainability and this has slowed their progress in terms of enacting progressive legislation. Unlike Denmark, the US struggles to find a majority in favor of most bills and climate change action has suffered as a result.

Denmark has set the following goals: 35% of final energy consumption should come from renewables and overall energy consumption should be reduced by 7.6% based on the consumption levels from 2010 (Danish Energy Agency 2012). The desire to decrease overall consumption is a unique feature of the Danish Energy Agreement and will be accomplished by levying taxes on all types of energy. This will force Danish consumers to be aware of how much they consume and the energy efficiency of the appliances they buy. This is an effective way to modify the mindset of consumers and make them more aware of the unnecessary energy they consume. Another unique policy of the Energy Agreement is that all new buildings need to meet higher standards for energy efficiency. This means that new construction will have a more sustainable focus and as new buildings are constructed and older ones are destroyed there will be an ongoing evolution towards sustainable property development.

This regulation will also create a need for the research and development of products that can make buildings more energy efficient. This could have a wide range of positive impacts internationally. For example, if more efficient elevators are developed in Denmark then they can be brought to the United States and placed in buildings throughout American cities (elevators follow heating and cooling as the largest energy demanders in cities). These types of regulations are important for making citizens, companies, and developers aware of how much energy they are using and how they can benefit from being more efficient as these regulations become normalized.The Energy Agreement has a large portion that addresses heating plans. Due to the geographic location of Denmark, the whole nation must heat its building during the winter. In 2013, 29.7% of heating energy came from renewables which is a 21.7 percentage point increase from 1994, exemplifying the progress that has already been made. District heating plans have effectively reduced the amount of oil used in energy consumption for heating purposes. The Danish Energy Agency also indicated that they want all electric and heat energy needs to be met by renewables as soon as 2035 with half of electricity consumption coming from wind energy by 2020 (Danish Energy Agency 2015). As is evident, the Danes are committed to their low-carbon development strategy and are willing to achieve ambitious goals to make their nation fully renewable in the near future.

**Final Recommendations**

The recommendations are mostly made with the intention of modifying behavior at the individual level first. James Meadowcroft of Carleton University points out that there will be more significant kickback from policies that directly affect corporations, especially oil companies and other fossil fuel companies. These businesses have enough money to battle legislation that will attempt to weaken their industry. Therefore, these recommendations provide a less direct approach which focuses on changing the behavior of the people who can control the market decisions without directly attacking the companies that favor conventional energy.

*Sustainable Investing*

The economic concept that needs to be changed is the way investors choose their investments. The notion of sustainable investing is relatively new but has already gained momentum among environmentally conscious investors. Al Gore, famous for his revolutionary documentary *An Inconvenient Truth,* has unsurprisingly led the charge on sustainable investing with the successes of his newest venture, Generation Investment Management. Generation is a London-based business in which Al Gore is a partner and all investment decisions are made considering the sustainability of companies, socially

and environmentally. Economists have begun to claim that short-term mentalities are causing businesses to fail and weakening economies. The result of Generation's sustainable investing is that the company is one of the world's least volatile equity funds and had a 10 year average that ranked number 2 in a survey from over 200 equity managers (Fallows 2015). The success of Generation can encourage other large investors to look at their business practices and make their money while reducing the negative environmental and social impacts of some capitalist business machines.

The idea of responsible investing can help shift the mentality of producers and consumers, who are the actors with the power to change the way the market operates. In 1992, IKEA adopted "The Natural Step framework," a program of action developed in Sweden in which groups focus on their sustainability and find ways to achieve goals while maintaining certain "first-order principles" (Broman 2000).

Essentially, the Natural Step framework is a sustainable transition and can be applied to any sector. The case of IKEA exemplifies how businesses can change the way the population operates. IKEA single- handedly impacted the Swedish lightbulb market by improving the efficiency of CFL lightbulbs, informing consumers about the negatives of incandescent lightbulbs, and significantly lowered the prices of CLFs. The effect? CFL sales increased in Sweden and CFL producers realized that lightbulbs without mercury would become a popular item in the market (Broman 2000). Cleaner lighting can lead to an interest in cleaner appliances or cars as consumers realize that energy savings benefit their personal budget as much as they benefit the global environment. Like Generation, IKEA realized the value of long-term decision-making and used sustainability as a cornerstone of its business practices. The results were similar to Generation's results in that they revealed how lucrative sustainability can be for business. IKEA's sales of CFL lightbulbs also gave CFL producers the financial boost they needed to increase research and development to make their product more efficient. Neither IKEA nor Generation attack oil companies, but rather they promote incremental change and encourage shareholders to explore the financial profits of sustainable investment options.

Jerome van den Bergh established that in order to transition to sustainable energy and technologies there needs to be a proper economic incentive. Van den Bergh believes that sustainable investing needs to be encouraged by policies instead of leaving shareholders to choose their investments alone since "prices do not reflect social costs" in the investment market (van den Bergh 2013). Environmental economists have proposed a change in corporate law that makes shareholders accountable for the environmental and social impacts of the companies in which they invest. Shareholders and the stock market pressure companies to generate massive profits which lead them to engage in business that leads to unsustainable energy practices. If law were to hold shareholders liable for their investments then they would be more inclined to find alternative energy companies to support (Dangerman, Schellnhuber 2013). While this theory presents an effective way to change the way people invest, it may not be necessary if investors see the benefits of sustainable investing on their own. Looking at companies like Generation may lead larger investment management companies to adopt a long-term, sustainable investing mentality. The role of investors is of paramount importance to a sustainable energy transition. Investments and shareholding in fossil fuel companies is what created the lock-in of greenhouse gas emitting industries. If investments can shift away from fossil fuel companies then alternative energies will get the economic boost they need to increase research and development of their products. Investments lead to innovation which can make alternative energies more efficient and affordable. Increased investments in alternative energy would even the playing field with conventional energies. That being said, it needs to be understood that conventional industries make up nearly 90% of the economy and this transition process may lead to periods of low economic growth (van den Bergh 2013). However, if the success and stability of Generation and IKEA can be used as reassurance then investors may realize that the rewards of sustainable investing outweigh the risk of continuing to pump money into an unpredictable conventional energy system.

*Policy Changes and the "Back Door" Approach*

As stated before, a policy approach that directly threatens big business and oil companies will lead to a lot of anti-environmental lobbying from these companies with money to spare. Therefore, policies should be implemented that go around these companies and impact different areas of life. In the United States this "back door" tactic can lead to enduring policy that is not undermined by corporate lobbying and it can change the mentality of a population that has adopted increasingly unsustainable habits. One area where sustainability can be encouraged and enforced is in real estate. As shown by the Danish technique introduced above, building regulations can lead to a decrease in daily energy consumption and can increase the development of green building technology. As new buildings are built to meet low- energy standards there will be a sustainable evolution in property development. This

type of regulation will lead to lower energy consumption on all levels, from institutions to housing to business spaces.

Without directly regulating conventional energy or boosting alternative energy, this policy change can lead to an increase in green behavior and development. Inevitably, the best way to complete a green development project would be to have renewable energy power these buildings; however, this will be a conclusion that is drawn by the developers, not forced on them by government mandates.

*Incremental Adjustments*

A sustainable transition can also be called a sustainable evolution in that policies should promote enduring adjustments that resemble a "Darwinistic" process (Meadowcroft 2009). Incremental adjustments may not seem to be the most effective way to attack the pressing issues of climate change, but in the United States they offer a reasonable approach to sustainable transition. For example, instead of setting lofty carbon-cutting goals for decades in the future the US could start with a modest reduction meant to be achieved at the end of each year. An annual 1% increase in energy consumption from renewable energy would achieve the same goal as a 14% increase by the year 2030. However, this method would force the US to start renewable projects immediately. This would also produce tangible measures of progress instead of speculation that the US is "on track" to achieve their goals.

*National Standards, State Implemented Changes*

The most important conclusion drawn from this research is that the United States cannot have an effective sustainable energy transition if they continue to enact policies that blanket the entire nation. This means that the federal government should enact standards to be met be each state individually instead of standards to be met by the nation as a whole. This is more realistic than national goals because the United States is not nearly as homogenous as the model nations that have implemented sustainable transitions. While all of Denmark can benefit from regional heating plans, less than half of the United States population would deem a heating plan necessary. The following quote exemplifies the benefits of have state regulated sustainability projects:

> High feasibility can be assigned to geothermal energy as the primary energy source in the north-western United States, solar energy in the tropics, wind energy in the desert and high- altitude terrains, biomass energy in luxuriantly vegetated zones around the world and in regions that produce significant amounts of organic wastes, and nuclear energy in countries endowed with uranium/plutonium. Such perfect matches between energy demand and indigenous energy sources qualify as highly desirable cases of the much sought-after 'distributed energy system' (Inyang, Frimpong 2007).

Since the United States is geographically diverse, each state can develop strong alternative energy systems based on what it has available. As the quote says, the northern states can benefit from geothermal energy, coastal or mountainous states can develop onshore and offshore wind farms, and the southwestern deserts provide the perfect setting for solar farms. Not only does this allow each state to develop technology and systems that fit its economic and political needs, but also creates a very diverse energy system for the United States as a whole. With each state making its own gains in the alternative energy sector, the US will have access to innovation across a broad spectrum of energies.

California has already begun an independent solar energy campaign that supports the theory that states can lead its own sustainable energy charges. California set a goal in 2005 to reduce greenhouse gas emissions by 80% of the 1990 levels by 2050. This has resulted in California producing more energy from their solar spreads than all other sates combined. Research is also being done in the state to install and improve storage systems for days when supply does not meet demand (Gardiner 2015). California has put itself in a class with Germany and Denmark in terms of renewable energy production and this theory argues that each state in the US has the potential to develop its own transformative energy system. While government standards would fuel this recommendation, leadership for these sustainable state projects would be best led by a combination of state business leaders, NGOs, and government representatives so as to involve all the interests of leaders in each state. At the state-level this type of interaction and collaboration will be more manageable than at the national level where interests are more diverse and there are more needs to be met.

## Conclusion

A sustainable energy transition has become a necessity given the circumstances of climate change that have begun to effect economic, political, and social circumstances across the globe. As some nations, like Germany, Denmark, and the Netherlands, have taken aggressive steps towards slowing down the effects of climate change, other nations have been slow to curb their impact on global warming. The United States finds

itself the largest economy in the world, serving as an international leader in business and international politics. This means that US should be prepared to adopt a sustainable energy transition of their own. This is not just implementing legislation that leads to small changes; it is a comprehensive transition that brings together the goals of the business community, the political community, and individuals to create a sustainable future. The first recommendation for sustainability in the United States is to encourage sustainable investments. This can be encouraged by a change in corporate law or simply by publicizing the successes of sustainable investors who have found sustainable businesses to be lucrative and stable. Another recommendation for a sustainable energy transition is to implement building development regulations that set the tone for lower energy consumption everywhere, from households to warehouses to office spaces. This will help citizens understand that sustainable living will become the cornerstone of this transition and that lower energy consumption can benefit them as much as it can benefit the global community. Policy recommendations include a change in how standards are measured and the creation of state-based projects that reflect federally implemented standards. By setting more modest, yearly standards of increased renewables or GHG cuts progress will be more visible and action will be more immediate. Also, if states are striving to meet a modest yearly goal there will be more room for innovation and modification along the sustainable transition process. If a year-long investment proves to be a failure it will be much less detrimental than a two decade long project proving to be ineffective. Lastly, state-based alternative energy projects would be a more effective approach to sustainable development as it is easier to meet common goals on a smaller scale and each state has different interests and resources. Overall, sustainable development will be the result of collaboration, patience, and versatility by leaders and citizens alike.

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