Zach Karpovich

Accomplishing the Sustainable Energy Transition in Developed Countries

With the ability to forever alter the conditions of the planet, climate change looms as one of the biggest threats to continued human civilization on Earth. Climate change refers to the increased greenhouse effect that occurs when heat-trapping molecules--such as CO_2--are released into the atmosphere, mostly due to the burning of fossil fuels. When large amounts of carbon dioxide and other greenhouse gases are released, the atmosphere warms up, leading to higher temperatures, rising sea levels, a change in weather patterns, and more severe droughts. Because of the large number of consequences associated with it, climate change has recently been at the forefront of international discussions--with the Paris Climate Treaty the product of these talks. International cooperation to fight climate change is vital to a future that sees warming of under 2℃, however, it is not the only step needed. Once emissions goals have been set, it is ultimately up to individual countries to muster public support, funds, and legislative backing for green energy. This step--one could argue--is even harder than the idealistic thinking of international agreements. One challenge in particular facing developed nations today is, in fact, the very step of converting from fossil fuels to renewable energy--dubbed the “energy transition”.

The “energy transition” refers to the transition from an energy infrastructure reliant on fossil fuels to one built upon clean, renewable energies. However, while it sounds easy to accomplish, it is currently one of the biggest obstacles to a sustainable future. The “energy transition” tends to be a specific problem that solely afflicts developed countries--as developing countries often do not have the economic investment in energy infrastructure or widespread electrification that developed countries do. The fact that developed countries have, indeed,

invested so much in their energy infrastructures has done wonders for social and economic progress, however, it is now acting as an obstacle to the energy transition. Since so much money has gone into building these fossil fuel plants, massive amounts of money must now be wasted as they are shut down, only to have to pay again to build new, renewable energy sources. Additionally, the bill only grows as one must retrofit the electric grid--once designed to support on-demand generation--to handle the variable and distributed electricity generation. This means the building of smart sensors and battery storage, to combat the fluctuating energy generation of renewables like wind and solar. To an outsider, a task such as this seems impossible, yet many countries have already taken large steps and are on their way to completing the energy transition.

Germany and the United Arab Emirates (UAE) are two vastly different countries that have the same goal: completely end the consumption of fossil fuels and transition to renewable energy. Each of them has taken a wildly different approach to implementing green energy--and for very different reasons as well. Their success in the green energy field can, in my opinion, be used to highlight a variety of plans that can successfully be used to tackle the energy transition, in addition to emphasizing the challenges and setbacks both the UAE and Germany faced in this area, so as to show other countries what to avoid.

Germany's energy transition, or Energiewende, has largely been driven by a civil society movement. Strong public support for green energy, emissions reductions, and environmentalism has pushed the German government to enact progressive renewable energy policies. In fact, over 80% of Germans currently support the energy transition, and a majority of Germans currently own a form of renewable energy generation or hold investments in renewables. This strong support and involvement in environmentalism has caused the Energiewende to continue even in

the face of challenges. One of the largest challenges Germany has faced is the rising cost of electricity--up 30% from 2008--caused by the rapid building of new renewable energy capacity. However, this cost has been accepted by most Germans--mostly due to the fact that Germans still spend the same amount of disposable income on electricity as other countries and that extreme advances have been made as a result of this price increase. To date, Germany sources 32% of its electricity from renewables, up from only 14% in 2007. Therefore, much of the German public finds the high cost of electricity acceptable. This success shows that strong public support, even coupled with high energy costs, can still make the energy transition a success.

The UAE, on the other hand, has very little efforts on behalf of civil society to complete the energy transition. Instead, it is doing so for economic reasons. The UAE's high solar irradiance levels have made solar energy the cheapest form of electricity--even outpacing natural gas and coal. Because of this, the UAE has invested $163 billion to expand the use of solar. The economic aspect of renewables, not public support, has been the driving force for the expansion of solar. In fact, much of the UAE's populace was initially opposed to this move, mostly because the UAE is an oil superpower that holds vast amounts of oil and natural gas. However, the government was able to muster support for investment in renewables by highlighting the economic aspects of renewables--specifically the cheaper electricity costs and higher-paying, more stable jobs.

Overall, the success of Germany and the UAE in implementing energy reform to commit to the shift away from fossil fuels paints the way for other countries to follow. Countries such as the U.S., which is currently struggling with the energy transition, could and should follow in the UAE's footsteps to highlight the economic benefits to garner public support for such a partisan

issue. Even today, the U.S. already has twice as many people employed in solar jobs than as coal, a statistic never cited under this administration. Additionally, renewables are adding jobs at a rate 17 times faster than the overall economy, indicating that renewables are where many jobs will be created in the future. To accomplish the energy transition, strong public support is needed. Whether this be through an environmentalist or economist point of view does not matter, so long as the public sees the value in completing the energy transition and upholds the goals of the Paris Climate Treaty.

Bibliography

"Crude Oil Prices Today." *OilPrice.com*. N.p., 23 July 2017. Web. 23 July 2017.

Dorsey, Piccirilli. "Jobs | Topics | EESI." *EESI - Environmental and Energy Study Institute*. N.p., n.d. Web. 23 July 2017.

"Energy Transition Initiative." *Department of Energy*. N.p., n.d. Web. 23 July 2017.

"Energy - United Nations Sustainable Development." *United Nations*. United Nations, n.d. Web. 23 July 2017.

"Making Progress with the "Energiewende"." *German Missions in the United States - Energiewende in Germany*. N.p., n.d. Web. 23 July 2017.

Mwangi, Patrick. "Energy, Climate, Technology." *UN Environment Energy*. N.p., n.d. Web. 23 July 2017

"Renewable Energy Prospects: United Arab Emirates." *IRENA | Publications | Reports and Papers | Renewable Energy Prospects: United Arab Emirates*. N.p., n.d. Web. 23 July 2017.

"Renewable Energy Quick Facts." *American Physical Society*. N.p., n.d. Web. 23 July 2017.

UAE Clean Energy." *Masdar.ae*. N.p., n.d. Web. 23 July 2017.

"UAE to Invest $163bn in Renewable-energy Projects." *UAE News | Al Jazeera*. Al Jazeera, 10 Jan. 2017. Web. 23 July 2017.