Mobilizing Climate Change Solutions: Major Portfolio

Brandon Cormier

September 2015

York University, Toronto, Ontario, Canada

Student Signature:

Brandon Cormier

Supervisor Signature:

Dr. Jose Etcheverry

A Major Portfolio submitted to the Faculty of Environmental Studies in partial fulfillment of the requirements for the degree of Master in Environmental Studies

Foreword

This major research portfolio satisfies the requirements of the MES degree by meeting the expectations outlined within my Plan of Study, Major Research Proposal, and my overall learning interests on mobilizing climate change solutions. This portfolio's purpose is to demonstrate the journey I undertook at FES not only in researching climate change solutions, but also in using my research to make a difference in the world. I succeeded in this journey, allowing my time at FES to contribute to the bigger climate picture, which is what studying the environment should be about.

Table of Contents

I. Synthesis Report

Working Title of Portfolio

Mobilizing Climate Change Solutions

Name of Supervisor

Dr. Jose Etcheverry

Research Keywords

Collaboration, Civil Society Mobilization, Civil Society Organizations (CSO's), Renewable Energy, Climate Change, Policy, Ethics, Knowledge Mobilization, Capacity Development

Role of Portfolio in the Plan of Study

This portfolio is a combination of written work and practical experience facilitating and implementing climate change solutions focused on 100% renewable energy

Research Topic

My research focuses on identifying barriers to addressing climate change through the use of 100% renewable energy solutions. Given the nature of this topic, I felt it was important for me to focus on a real climate change solution as part of my research, and therefore embraced an opportunity to work abroad to help host an international workshop on convincing the Climate Action Network International to undertake 100% Renewable Energy as one of its campaign goals. I succeeded in that journey and I discuss it further within this portfolio.

Research Context

Climate change is a chronic challenge facing our generation and at the time of this writing, 2015, there are many developments amongst key decision makers and promising events that could contribute to making this a historic year in climate (and human) history. To visualize hope, consider the upcoming United Nations Climate Summit (that will take place in Paris in December of 2015), the release of the Pope's 2015 Encyclical *Laudato Si* (whose subtitle is 'On Care for Our Common Home'), and here in our country the new effort of leading Canadian scholars in developing a joint consensus-based document on practical climate solutions that can be implemented in Canada right away. These hopeful developments inform my research, which focuses on civil society solutions to climate change. More specifically, my MES portfolio focuses on the ethics surrounding climate change, and the possibility of 100% renewable energy as a key solution.

For renewable energy to be a viable climate change strategy it should ideally be implemented for 100% of all our energy needs worldwide as soon as possible to avert the worst consequences of climate change. As this is an impossible goal for any one person (or politician), Civil Society Organizations (CSO's) are essential to promote, coordinate, and facilitate the implementation of this goal. While CSO's have an important role to play in the 100% renewable energy solution, they currently are not in an effective position to do so since they are lacking: a clear strategy, collaboration, and coordination with each other in regards to this objective. To this end, any strategies effective for one area need to be replicable for others to employ/modify (due to the nature of climate change being a global phenomenon), and the sharing of knowledge and know-how is a crucial role that CSO's can play. That focus is explored further within my portfolio.

Research Question and Portfolio Objectives

Given the importance and significance of climate change to our generation, why are renewable energy solutions so difficult to implement? What barriers are in place, and what does society need to change, in order to implement a plausible climate change renewable energy solution?

Supplementary Research Question

What is/are the role/s of CSO's in helping society to implement climate change solutions, for example to achieve the goal of 100% renewable energy globally by 2050?

In the process of addressing these two research questions I have tried to focus on the ethics surrounding climate change and attempted to explore some key drivers for advancing practical action on renewable energy implementation.

The main outcomes of my research are as follows:

- Worked with the Climate Action Network International (CAN-I) so its international members could understand better the multiple benefits of embracing 100% renewable energy during a workshop held in Istanbul Turkey during October 7th to the 10th of 2015

- Formulated key recommendations for CAN-I to use 100% renewable energy as a new campaign goal

- Identified key campaign opportunities for mitigating the effects of climate change through renewable energy

- Evaluated key ethical issues that pose barriers to implementing renewable energy solutions

-Develop a Shared Solutions Campaign Matrix for CAN-I

-Explored capacity building needs on renewable energy expertise and campaigning for CAN-I that can also serve for other NGOs and government organizations

Personal Statement

I came to FES to study climate change solutions because this has been a passion of mine since the early 2000s. Initially, I chose corporate solutions to climate change as my focus, but as I started to delve deeper into my research I discovered that other stakeholders may be a more effective option for me to target. As I evaluated other stakeholders and the potential for change that they offered, I discovered that CSO's can have a profound impact in promoting whichever solution we may choose, and therefore would be the most effective area to focus my research efforts. Renewable energy became part of this picture when I was introduced to its ability to reduce CO_2 emissions during a Climate Policy class I took at FES in 2014. To expand on what I learned in that class, while timelines may differ, the general consensus in the CSO field is that yes 100% renewable energy is technically possible and is also an effective solution for going forward to achieve energy security, availability, equity, and to halt climate emissions. While there are currently many roadblocks and barriers standing in the way of achieving this renewable energy goal, a well-devised solutions framework can be used to achieve practical victories. Learning this was very exciting and motivating for me, since it has also always made perfect sense to me that no matter what solution we may choose to implement, it cannot be fully effective if the foundation that our lifestyles are running off is unsustainable, and highly carbon intensive (conventional combustion based energy). An example of this is building electric cars, but using conventional energy to build and run all the sales facilities.

The game changer during my time at FES was being presented with the opportunity to go to Turkey to work with the Climate Action Network and to play a key role in an international workshop to help them decide if they should embrace 100% renewable energy as a campaign objective. When presented with this opportunity I anticipated that I would be able to fulfill my research goals and help contribute to key international work on climate change mitigation.

Finally, I firmly believe that the most important trait I have honed as a researcher in this field is my ability to move from being a passive bystander to becoming an active agent of change. Through my time at FES I have discovered that climate change is an international security issue that could very well be the cause of conflict in the future due to its detrimental effects on natural resources. This is where I would like to focus my research and professional contributions going forward.

Research Design and Methodology

For this portfolio, I have used both primary and secondary research methods. I have taken an ethnographic approach, looking at the role people play in helping us to choose and implement climate change renewable energy solutions. The structure of this portfolio is a combination of written works on the significance of climate change, and what is needed to champion forward effective renewable energy solutions.

To prepare the primary research I conducted interviews with experts in the renewable energy field to gather insights on the barriers they face during their work, as well as what they feel is needed for us to overcome those barriers. Also, as part of the primary research, I consulted other disciplines to evaluate their thoughts on the barriers to solutions. My reasoning behind consulting other disciplines was to try to obtain new perspectives on the issue of climate change and renewable energy solutions from outside the traditional research box.

The following experts were chosen for interviews during the primary research phase:
Stephan Singer (WWF- Director Global Energy Policy), Ansgar Kiene (Greenpeace), Keane Gruending (SFU Renewable Cities Communications Coordinator), Claire Havens (Policy Analyst SFU), Christine Lins (REN 21), Eric Martinot (Global Futures Report), Jeremy Moorhouse (Clean Energy Canada), Clare Demerse (Clean Energy Canada), Hugo Lucas (IRENA), Alan Miller (Formerly with the World Bank, GEF and IFC), and Janet Sawin (PI of Renewables Global Status Report).

Please see Appendix 1 for further details about the experts interviewed and the questionnaire used.

For the secondary research component I consulted key reports, journals, and books on the topic of climate change and renewable energy.

My research can be considered qualitative research, since it is focused on people and society, and therefore I am evaluating unstructured data.

When looking at the methodologies of research on collaboration as a whole, one of the challenges with this type of research is ensuring that all the parties involved don't lose their identity in the process. I have considered this thoroughly when developing a plan.

Courses/Readings/Research in this Field

To further my knowledge in this area I took a variety of courses at FES on climate change, renewable energy, ethnographic research methods, and climate ethics.

Within those fields of study, a lot of the core research on the topic of CSO engagement for the 2050 100 % renewable energy campaign was conducted by Professor Eric Martinot as part of his REN 21's Global Futures Report. In that report Professor Martinot found that there is a lot of disagreement on the timeline for 100% renewable energy globally to become a reality. For example, countries like Uruguay have very ambitious targets of going 100 % renewable by 2020, while other key players like the International Renewable Energy Agency (IRENA) are embracing much less ambitious goals like 30% by 2030. The over 220 energy professionals that Prof. Martinot interviewed for his report recommended trying not to get too fixated on a precise timeline, since this is where you will lose people. Instead, they recommend staying focused on building capacity and keeping people interested on achieving 100% renewable energy.

Another piece of notable work on achieving 100% renewable energy worldwide is being conducted by Professor Mark Z. Jacobson and a group of his graduate students at Stanford University. Professor Jacobson is currently creating plans for 100% renewable energy in all the states of the USA, planning solutions to overcome all the barriers that they could potentially face, and is working on expanding his plan into Canada and other regions. His research is open source and is therefore attracting a lot of coverage since his work can be duplicated in other areas of the world.

Current energy producers, however, have a different view from Professors Martinot and Jacobson. For example, In Canada fossil fuel producers and nuclear energy lobbyists are getting a lot of political attention and thus far dominate energy discussions at the moment of this writing.

Those two lobbying groups represent a significant barrier that needs to be addressed not only here in Canada but in many countries around the world.

Research Timeline

The research in this portfolio was completed over the course of my two year MES degree (September 2013 to August 2015) and it includes a summary of several knowledge mobilization activities that I have been and continue to be engaged on to address climate change by using renewable energy as a mitigation solution.

During my final year at FES I spent 2 semesters working in an intern position with Environment Canada on the Climate Change and Sustainable Development Team. This position has allowed me to gain an inside perspective of government operations surrounding the barriers to climate solutions. That job has given me an opportunity to apply what I have learned during my studies, and I have been fortunate to present my research to the Director within the Sustainable Development Directorate of Environment Canada which has helped me to gain further skills as a researcher and professional activist.

II. Call for Action: Ethics and Global Climate Change

Introduction

This section was developed to provide a basic and brief overview of climate change in preparation of the CAN workshop that took place in Istanbul during October 2014. The goal of the section was to organize information gained during my work at FES to help develop themes for discussion during the workshop. The section was updated to reflect some important developments that occurred since the workshop took place (namely the release of Pope Francis Encyclical on Climate Change titled *Laudato Si*)

* * *

Climate change is a global phenomenon faced by our current and future generations. Climate change is described as the ‘perfect storm’ by Stephan Gardiner in his article ‘Ethics and Global Climate Change’ (Gardiner, 2010), since it incorporates intergenerational effects, skewed vulnerabilities, and is a truly global phenomenon. Climate change also correlates well with Garett Hardin’s idea of the ‘tragedy of the commons’ (Hardin, 1968) when viewing the world as

one global commons. The tragedy of the commons occurs when public resources are exploited, and has no real solution. Instead, it requires a change in human attitudes and behavior, and this is where climate change ethics comes into play. Currently, 97% scientists agree that climate change is a global phenomenon like humanity has never seen before, and one that if we don't act on quickly, we may not be able to reverse.[1] Why have we not acted on this huge challenge yet? …Is this inaction a matter of ethics?

The term climate change can be defined as the change in global climate patterns apparent from the mid to late 20th century onwards, attributed largely to the increased levels of atmospheric carbon dioxide produced by the use of fossil fuels.

Contrary to the beliefs of skeptics, scientific measurements show that in terms of global temperature, the Earth's surface has warmed by about 0.8 degrees centigrade. This warming has not been gradual over hundreds of years, but instead was most intense from 1910-40 and 1975 to 2000. Corresponding to this temperature increase, recent scientific findings also show that the atmospheric concentrations of CO_2 measured from ice cores extracted from Antarctica show that our current CO_2 concentrations considerably exceed the natural range measuring back 650,000 thousand years (IPCC, 2014). This suggests that any activity that releases CO_2 into the atmosphere can be harmful, including human activities.

Global warming is a term often used interchangeably with climate change, but it is not as widely accepted. While global warming refers to the increase in the Earth's surface temperatures due to increased concentrations of greenhouse gases (GHGs), the term climate change leaves less room for skepticism by referring to any change in the Earth's climate system due to human activities. However, the term global warming is in fact more accurate since these other aspects are a result of the increase in temperature. For instance, there is recent science that suggests that increased instances of earthquakes are linked to climate change. (IPCC, 2007)

To sum up, some of the negative effects we can expect to experience from climate change are listed below (IPCC, 2013):

- **Changes in Climate have caused impacts on natural systems across all continents and oceans**

[1] For details see climate.nasa.gov/scientific-consensus

Perhaps the most serious effects of climate change are those imposed on natural systems. As an example, the speed that the polar ice caps melt affects the current patterns within the oceans (e.g. ocean conveyer belt). This is significant because the ocean is the number one driver/controller of the climate on planet earth, and all other food chains depend on these cycles.

- **As climate change becomes more prominent so will the instances of extreme weather events.**
  Impacts from recent climate-related extremes, such as heat waves, droughts, floods, cyclones, and wildfires, reveal significant vulnerability and exposure of some ecosystems and many human systems to current climate variability
- **In many regions, changing precipitation or melting snow and ice are altering hydrological systems, which affects fresh water resources in terms of quantity and quality**

  For example, the polar ice caps do not melt and refreeze each year, but they do grow or shrink depending on climate variation. Right now they are shrinking due to global warming, and in doing this the fresh water that they hold is being drained and mixed with the salt water in the ocean.

- **Climate change increases instances of species extinctions**
  Climate change effects have the potential to drastically change entire ecosystems and habitats making them inhabitable for many species. Many terrestrial, freshwater, and marine species have shifted their geographic ranges, seasonal activities, migration patterns, species abundance, and species interactions in response to ongoing climate change.
- **Based on many studies covering a wide range of regions and crops, negative impacts of climate change on crop yields are becoming more common**

  International food security is becoming jeopardized as farmland and other aspects of food production are being affected by drought and natural system changes brought on by climate change.

- **There is an intimate relationship between the poor and the fragility of the planet** (Holy Father Pope Francis, 2015)

  Differences in vulnerability and exposure arise from non-climatic factors and from multidimensional inequalities often produced by uneven development processes. Climate-related hazards exacerbate other stressors, often with negative outcomes for livelihoods, especially for people living in poverty (particularly women who due to prevalent social inequality are over-represented amongst low-income people).

- **Violent conflict increases vulnerability to climate change**

  International security becomes harder to maintain as natural resources are depleted through climate change effects

The results of these effects contribute to an unstable and unpredictable climatic future for the Earth, and therefore also for humanity. Adding to this significance is the fact that we cannot choose to just ignore climate change, since it won't just go away.

Why is the Climate Changing?

In brief, the climate is changing because of the human activity of burning fossil fuels (transferring CO_2 from the ground into the atmosphere). When fossil fuels combust, they release GHGs and SLCPs (short lived climate pollutants) that increase their composition of the atmosphere.

To explain this further, I have included a diagram below (figure 1) which shows that as solar radiation enters the atmosphere, some of it is reflected from the atmosphere back into space, and the remainder of it passes through the atmosphere and is absorbed by the surface of the Earth.

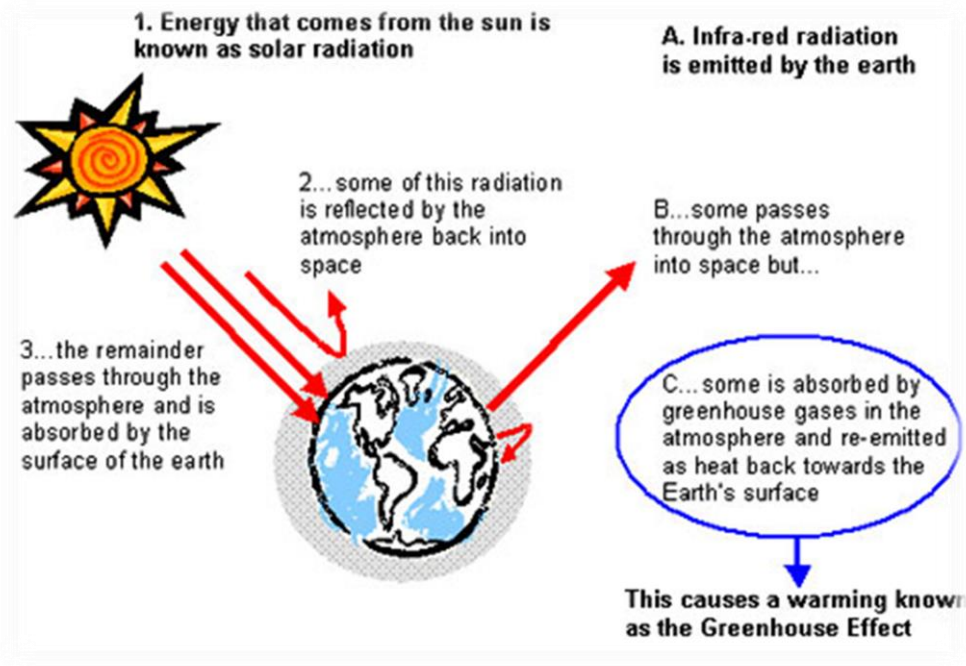


Figure 1: The Greenhouse Gas Effect (NASA Climate Kids: Eyes on the Earth)

This heat is then emitted out of the Earth in the form of infra-red radiation. Some of this radiation passes through the atmosphere and is released into space, but some of it is absorbed by the GHGs in the atmosphere and is reemitted back as extra heat towards the Earth. This phenomenon is known as the greenhouse effect, which inevitably leads to increased heat retention and climate change.

As criminal as the term 'greenhouse gases' may sound, they are also important to have in the atmosphere. Without them in the Earth's atmosphere, the planet's surface temperature would be too cold to sustain life. We need some greenhouse gases to stabilize the Earth's atmosphere, but when concentrations get too high, the climate gets more difficult to stabilize to the extent that we and all other species are accustomed.

The Negative Effects of Climate Change

The reason why altering the composition of the Earth's atmosphere is acutely worrying to many scientists is due to the resulting dramatic effects it could potentially have on our way of life. Some examples:

- **Climate change affects people**

  Climate change will affect everyone, but some people more than others depending on their residential location, and financial security. Massive groups of people could potentially be affected by diseases, lack of clean drinking water, extreme weather catastrophes, droughts and food shortages according to some scientists.

- **Climate change causes extreme weather**

  Climate change causes more extreme and unpredictable weather; it is not just a warming effect. For example, altering the composition of the atmosphere can lead to drier summers, more snow in the winter, more intense wind storms/ tornados etc.

- **Climate change increases extinctions**

  Climate change effects have the potential to drastically change ecosystems and habitats making them inhabitable for delicate/vulnerable species. This will impact humans because all species have a role in the ecosystem they are a part of, so the loss of one species will have a domino effect on other components of the ecosystem.

- **Climate change induces polar ice cap melting**

  The polar ice caps do not melt and refreeze each year rather they grow or shrink depending on variations in the climate. Right now, the ice caps are shrinking due to global warming, causing the fresh water reserves they hold to blend with the thick salty artic waters; bad news for a planet with limited fresh water supplies.

- **Climate change assists in the rising of ocean temperatures**

  The melting of the polar ice caps has the opposite effect of warming the ocean rather than cooling it due to a phenomenon called the ocean conveyer belt. To explain, under normal circumstances cold salty water has a higher density than warmer surface water, and therefore falls to the bottom of the ocean, while the surface water stays warmer at the top. This shift causes a current referred to as the conveyor belt to form, which carries cold water to the equator and warm water to the poles. This is a delicate, crucial, process that keeps our ocean's climate systems stable. Climate change disrupts this process by causing the water that falls from the glaciers to be warmed when it enters the ocean and therefore will not drop so quickly down to the bottom as it normally would, and without this mixing of water the ocean conveyor belt does not get enough momentum to form, and to carry water from the equator to the poles.

The warmer ocean is also becoming increasingly acidic due to higher concentrations of absorbed CO_2, which can negatively impact various species of marine life. For example, without alkaline levels in the water, the mussels and snails cannot build a hard shell; the same is true for calcification of coral.

An important function of the ocean conveyor belt is that it carries CO_2 from the surface water and stores it deep down in the ocean. If the natural ocean conveyor belt stops, the oceans would no longer be the massive carbon storage sinks that it currently is.

Climate Change and Nature: The Importance of Solutions

Some of the most troublesome effects of climate change are those imposed on natural areas. Climate change is an added stress to sensitive areas, causing physical and biological challenges. To expand on some of the ecosystem components and how and when they will be affected by climate change, I have included the chart below:

Component	Response time (range)	Example
	Fast responses	
Atmosphere	Hours to weeks	Daily heating and cooling Gradual buildup of heat wave
Land surface	Hours to months	Daily heating of upper ground surface Midwinter freezing and thawing
Ocean surface	Days to months	Afternoon heating of upper few feet Warmest beach temperatures late in summer
Vegetation	Hours to decades/centuries	Sudden leaf kill by frost Slow growth of trees to maturity
Sea ice	Weeks to years	Late-winter maximum extent Historical changes near Iceland
	Slow responses	
Mountain glaciers	10–100 years	Widespread glacier retreat in 20th century
Deep ocean	100–1500 years	Time to replace world's deep water
Ice sheets	100–10,000 years	Advances/retreats of ice sheet margins Growth/decay of entire ice sheet

Table 1: Ecosystem Components and Climate Change (Karl T. Trenberth, 2006)

As Table 1 shows there are a significant number of major changes taking places that will change the landscape of an ecosystem and will affect how a species will be able to survive in it. Table1 also notes the increase in temperature aside the impact mechanisms that this affects, and then the biodiversity that is affected.

Looking more deeply into the concerns regarding the natural environment and changing climate:

- **Species at risk:** The concern with species at risk is that they already have small numbers, placing them in a less than ideal situation to handle the added stress
- **Aquatic Habitats**: The warmer water will favor warmer stream species and alter community dynamics and compositions
- **Wetlands**: Wetlands are a physiologically limited system that is particularly vulnerable to changes in temperatures since it affects nutrient inputs into the soils
- **Coastal Ecosystems**: Migrating salt water into freshwater streams, soil erosion and loss of fresh water plant life, loss of habitat for coastal migrating shore birds, and thus altering food chain and community dynamics within the ecosystems.
- **Alpine Ecosystems**: Similar to wetlands, alpine ecosystems need a precise mix of elevation, and air chemistry that would naturally be disrupted by climate change
- **Forest and Grassland Ecosystems**: Increased risk of fire and dryer climates that are more vulnerable to invasive species take over.
- **Invasive Species**: In general climate change can alter an ecosystem with a competing invasive species to be more favorable for that species. For example: in BC the invasive warm water perch may thrive as a result of a rise in water temperatures. Invasive species can also take advantage of the weakened immune system of an ecosystem that it stressed under climate change.

The Decision Making Context

Decision making surrounding climate change operates in a world of constant uncertainty about both the timing and severity of climate related catastrophes. It also involves shared responsibility since the effects from one country's actions can affect another. A third complicating factor is that climate change is an intergenerational issue, meaning the decisions we make now will affect life on Earth long into the future. We need to become conscious that we are

in a significant time in history where we will set the stage (whether we like it or not) for the amount of havoc we leave for future generations. This requires a distribution of burdens, and representation of those who are not able to represent themselves- 2 aspects of ethics that complicate climate decision-making.

Recently, there has been a variety of authoritative bodies encouraging the decision to act now on climate change. For example, the Pope has released an encyclical addressing the climate and highlighting the importance of making the decision to act now. Within this Encyclical, the Pope asks us to recognize that the natural environment has been greatly damaged by our irresponsible behavior, as well as the social environment from our lack of understanding of undisputed universal truths. The Pope points out that the misuse of creation begins when we no longer recognize higher instances than ourselves, seeing nothing but ourselves. This echoes statements from thousands of scientists, philosophers and theologians. Some of the points raised by the Pope are as follows:

- **The Issue of Fresh Water:** As the effects of climate change worsens, so will the quality and availability, and distribution of our global water supply. In fact, a water shortage affecting billions of people could begin in few decades unless timely action is undertaken.
- **Decline in Quality of Human Life and Breakdown of Society:** The social dynamics of climate change could include unemployment, inequitable distribution and consumption of energy, and new forms of social aggression (especially expected in areas of drought).
- **The Loss of Biodiversity:** The Earth's resources are being exploited at unsustainable levels of consumption due to a chronic shortsighted view of the economy.
- **Global Inequality**: Unequal distribution of the population and its resources will cause poor people to feel the effects of climate change more so then the wealthy.
- **Injustice between Generations:** We are faced with the dilemma of needing to make sacrifices now in order to benefit a future society. In history, this is something that humanity has been good at in terms of war and revolutions, but in regards to the slow building climate process, it seems like this is an issue humanity is not designed to address. Striking an appropriate balance here become essential.

The Pope also mentions in his encyclical that our society is no longer viewing ourselves as a common family, and has forgotten the principle of the common good. As part of a solution to this, the Pope highlights the importance of building a relationship with our surroundings. As a pleasant ending to the Encyclical two prayers are offered: one for believers, and another for all of us to ask for the inspiration to take on the challenge of caring for creation. This is a very important lesson for everyone on inclusion. It is also important to note that while there are still controversial statements in the Pope's document that have not been agreed upon (like the issue over consumerism control versus population control) but one message remains clear: humans are having an disproportionate and unsustainable impact on the planet and its resources, and we need to curb our destructive behavior or we risk destroying the planet. Another universal truth as seen in the Pope's document is that people in authority are more concerned with masking the challenge than solving it. This is something very important to note in term of decision-making and climate change, since being on the 'same page' is the first step. This also reinforces the importance of high-level, influential documents such as this encyclical to be produced, as there is still a lot of skepticism and lack of action from decision makers and authoritative figures.

Reflections for Planning Renewable Energy Solutions

Climate change is a global challenge whose complications create the need for collaboration from a variety of parties. When formulating renewable energy solutions it is important to remember the following principles:

- **Time is the Essence-** The effects from climate change affect our generation and generations to follow
- **Geographical Scope-** Climate change affects all areas of the planet, and in different ways; the carbon intensive activities taking place in on area can affect other areas of the planet.
- **Climate change affects Human Rights**-Food security, water, and housing all could be in jeopardy from climate change effects. Therefore, a stable climate is key in achieving social justice
- **Climate Induced Poverty**- The poor will be far more vulnerable to feeling the negative effects of climate change.

- **Enforcement is Essential-** Due to the 'Tragedy of the Commons' paradox (Hardin, 1968), it is absolutely essential to strictly enforce climate rules and policies. This is because when the world is a commons, there needs to be incentives for people to follow the rules.
- **Collaboration is also Essential-** Climate change is not something any one body can tackle on its own. Time is of the essence so we need to learn from each other's successes and failures and reach out when we are in need- both on an individual or group basis.
- **Where to start? Everywhere! -** It is really important to escape the mind frame that there is going to be 1 miracle solution to climate change. The mind frame that until a solution is perfected it can't be embraced needs to be challenged. For example, maybe you think that renewable energy is not currently powerful enough for 100% of our energy needs, doesn't mean it can't be embraced for the energy needs it is able to address. Perfection kills motivation, and encouraging people to start implementing solutions where they can/where their interests lie is much more conductive.

Renewable energy is a viable solution since it tackles the climate challenge from the 'bottom up' powering our destructive lifestyle in a sustainable way. Once we have a foundation that we can manage (is sustainable) other solutions like forest management, transportation, efficient infrastructure etc. can be truly effective, complementing and building our sustainable lifestyle stronger. Otherwise, if we implemented solutions like transportation and forest management but continue to burn fossil fuels as our primary source of energy, it will be like taking 1 step forward and 2 steps back.

An Overview of the Ethical Dimensions of Climate Change

The role of trust is a huge aspect of climate change ethics in terms of both individual and group action (or lack of). If we were able to trust that other people were going to act towards mitigating climate change, would we act too? But since we think is not the case, we want to use the resource for ourselves instead? This idea is presented by Garett Hardin in his piece: 'The Tragedy of the Commons' (Hardin, 1968). With climate change, people are subject to the same "no one else is acting towards climate change, so if I do, my small individual action will be meaningless" thinking and so they choose not to be the only ones sacrificing for the group cause.

The difference is, unlike the farmers who had other options for feeding their sheep, we don't have another planet.

Climate change hurts everything that is important to us: personal security, personal health, biodiversity, clean drinking water, human rights, and the effects from it may be irreversible. It is unlike any other crisis we have faced in the past because if we don't act towards mitigating it the effects will be inevitable; so we don't have a choice.

Stephan Gardiner talked about the ethical dimensions of climate change in his article 'Ethics and Global Climate Change' (Gardiner, 2010). He says that climate change can be described as the 'perfect moral storm' due to its skewed vulnerabilities, intergenerational effects, and the fact that it is a truly global phenomenon. Each of these factors brings up a set of ethical issues, and it is truly global because not only does it 'burden' us all, but all of our actions (or lack of) affect one another. Then, this is all exaggerated further by intergenerational effects and the question of whether we should be considering the future generation today if it means that we are inconvenienced. As for skewed vulnerabilities, this refers to how developed nations have reaped the majority of the benefits from our exploitation of natural resources, but it is underdeveloped nations that are going to be hit the hardest by the consequences, mainly from their lack of capital and infrastructure.

The ethical dimensions of the ecological climate change are also very important to mention. We can ask the question, do developed nations have a moral obligation to the natural environment to compensate for climate change related damages? If so, on what grounds are we drawing this conclusion? For context, if an insect infestations devastate a forest, is the insect morally obligated to compensate, or no because they just act naturally? If humans are responsible but insects are not, are we accounting for our ability to know what we are doing? But maybe, we don't know what we are doing? As a race, we are more connected (virtually), but disconnected (personally) than ever before. And, if we are holding ourselves morally responsible because we should have been intelligent enough to 'know better' then are we saying that we should be able to act against instinct?

This concludes a very important aspect of the climate change ethics dilemma: if we are going to try to solve the tragedy of the commons scenario, we need trust. We need to trust that other

people are going to act for the greater good as we are- This is why trust is such a big element of the climate change ethics predicament.

Individuals and Solutions

Are individuals responsible for only themselves, or also to others? Most people would agree that individuals are at least responsible for themselves and their children, but what about the greater good of humanity as a whole, and future generations beyond our family tree, and even other creatures?

Climate change is unique in the sense that it is not an issue that anyone can personally relate to, yet the effects are frightening and real for everyone. For example, some of the personal hardships that are threats to people are:

- Lack of personal security
- Lack of Political Security
- Health Difficulties
- Lack of biodiversity (access to a variety of species for entertainment, medicinal and food security purposes).
- Shortage of clean drinking water.

All of these effects combined lead to a reduction in our ability to maintain our lifestyles, and other aspects of our lives that are universally important, like health, family, jobs etc.

So, given the obvious significance of climate change, why our lack of action?

It's complicated! But in a nutshell, it is because we are not designed for this; everything in our lives is geared towards having more and surpassing others in order to achieve success within our lifetime. For example, grading in schools at any age (especially if a bell curve policy is enforced) it about getting better than the other students in the class. For example, if a student is smart, he/she is more likely to be successful if they keep their knowledge to themselves than if they teach others. In fact, sharing or helping others is actually harmful towards your success; more smart students means more less A+ spaces available on the bell curve, more competition to get into university, and in the job market etc. Therefore, we grow up knowing that while helping others is intrinsically rewarding, there are not many practical benefits of acting this way. This

leads to another reason why renewable energy is such an obvious solution to implement; While it does require some process changes, the fundamental ways we live our lives can stay the same- the change is ‘behind the scenes’. To explain, a person in a highly energy efficient / solar power building can take part in the same activities in their home as someone in an inefficient home, but have significantly less impact. Given the severity of, and urgency to act on climate change, and the barriers to implementing solutions, these reasons make renewable energy an excellent solution to reduce the amount of carbon we release into the atmosphere. This way, we can work on other solutions without the crippling worry of emitting carbon in places where it is not necessary since other options are available.

When talking about renewable energy as a solution to climate change, how we frame the challenge is crucial. For example, it is not productive to approach the fossil fuel industry saying ‘we found a better, newest, solution than the awful thing you’re doing, so we need you to come work doing renewables instead- this is asking for push back. Instead, the transition must be approached the same way we approach warfare and weapon industries at the end of a war: ‘thank you for your hard work, and thank you for helping us through that time to get us to where we are today. Thank you for providing us with the resources to create this new better way that we now need your help to implement (in this case renewable energy, in the case of war, rebuilding the country)’.

Many of the challenges mentioned fall under the umbrella of psychology and climate change, two major aspects of the psychology conversation that dictate our behavior are our culture and religion. This makes reaching out to faith groups an important aspect of the solution, since they can emotionally connect with people to have impact on how they perceive and react to the threats. To expand, an example could be how some religions believe that the Earth (and its wrath) is totally beyond our control, and that we are so insignificant in comparison to it to possibly be affecting how the planet functions; this view dismisses the need to act towards the mitigation of climate change. Other religions believe that God gave us free will, and we are abusing that privilege by choosing to burn fossil fuels knowing they belong in the ground. In comparison, this view calls for action, and a need to conserve Gods creation. There is also the battle that is stemmed by faith over if over population or over consumption is the root cause of our challenge.

Political Solutions

There is debate over whether government leaders / policy makers should be held responsible for not being more proactive in pushing for climate change solutions. Climate change is a threat to political stability, as demonstrated recently in Syria, and so inaction on behalf of the government is paradoxical. For example, recently in Syria farmers were displaced from their land due to a long drought they are experiencing which has halted crop production. They were forced to move to the city and in turn started a revolution as a reaction to their anger with government's lack of action.

If climate change is expected to cause governments to respond to the increased need to secure food, water, and manage population densities. An excellent book to explain what it would be like to live in a world like this is 'Ethics of a Broken World' by Tim Mulgan (Mulgan, 2011).

The difference between available resources to respond to these issues of developed vs developing nations is also very controversial. For instance, do developed countries have a responsibility to held developing nations since they have used more oil to develop and contributed a higher concentration of GHG to the atmosphere than the developing nation did? What if the developed nation used these fossil fuels to develop health care solutions that the developing countries then benefited from?

There is also the role of enforcement that can only really be played by the government. So, should they then be held responsible for the implementation of enforcement policies to protect mitigation strategies? When agreements are not followed through, it creates a lack of confidence in the political systems, which has a tumble effect on the effectiveness of the political system, since people without confidence are less likely to vote and voice their opinions since they don't feel they will be heard. Then, the governments hear only the loud consistent of corporations and oil companies, causing them to cater to the '1% vs the 99%'.

As much as we cannot blame such a wide ranging challenge on any one individual/government, we can acknowledge that they do have a role to play. Tackling climate change is the ultimate challenge for any democratic body, and needs confident leadership that is up for it to conquer. Unfortunately, uncertainty is at the core of the climate change issue, and uncertainty is also a diplomatic tool to avoid implementation and settlement of policy.

Universal Responsibility

Climate change is a fundamental injustice to the planet and its inhabitants, and the ethical debate is whether we have a primitive responsibility to stop the destruction, given that we are the only species on the planet with the intelligence to makes that happen? Although far from practical, we could visit the idea of a one world government with universal laws. This would be a solution if the root of the problem is that countries are competing with one another, rather than working together. Currently, governing bodies like the UN are the closest thing we have to this, but The League of Nations that ended the First World War is a more accurate working example of this concept.

There is also a fundamental responsibility of the church to implement educational initiatives about climate change to its followers, and this can be considered part of a universal solution. Churches and religious figures are very influential and have just cause to be concerned about climate change, since the Earth is God's creation so we must take care of it, and respect our blessings. This is expressed in the recent release of the Popes Encyclical. The Pope should be recognized for the very modest, yet profoundly important way of framing the title of the encyclical: 'on care for our common home'. This is a very neutral and inclusive framing of the issue that allows all readers to feel the teachings are relevant to them. This could be a lesson to the climate change movement.

We should also consider whether we are speaking the wrong language when discussing climate change. Global conferences about climate change mitigation strategies are primarily spoken English, yet only 740 million people out of 7 billion or so speak English as a first or second language. Could it be possible that we need to speak more languages in order to engage more people? Are we attracting the wrong crowd?

Climate change is such a far reaching issue that one government body, individual, or group, cannot tackle it alone, so this is why the idea of implementing universal policies and standards, or engaging international groups and bodies could be an effective addition to a global climate change strategy.

Conclusion

Climate change is a serious, global ethical issue, comprised of both individual and group components. The key components of a climate change strategy from an ethical point of view are trust, and shared responsibility. We have discussed these aspects in terms of developed vs developing nations, current vs future generations, and human vs non-human beings, and demonstrated how deep an effect they can have on the effectiveness of a climate solution. We need to ask ourselves, what would a healthy relationship with the planet look like? Being clear about what we are aiming for, and then striving for it.

III. Implementing and Preparing for 100% Renewable Energy as a Climate Change Solution- The CAN Solutions Workshop

Overview

The significance of this section of my portfolio is to demonstrate how during my MES degree I understood the importance of expanding my learning horizons beyond those of the classroom, and embarked on a hands-on approach to climate solutions. The experience I gained during this practical involvement was invaluable and allowed me to network with, and learn from experts in the field. I came across an opportunity to work with the Climate Action Network on the development of renewable energy as a climate change solution, where I provided research support prior and during the workshop.

Introduction: The CAN Solutions Workshop

The Climate Action Network International (CAN) held a workshop in Istanbul Turkey from October 8-10 2014 which focused on learning and sharing strategies and tactics to overcome barriers to 100 % renewable energy, and discuss what kind of platform is needed to strengthen collaboration and coordination between CSOs working on solutions to increase the effectiveness of achieving this goal further. Prior to this workshop, CAN was looking to conduct research to gain a sense of how experts, and society in general, feel towards the idea of 100% renewable energy globally, and what the main road blocks are to achieving this goal. Understanding this situation will help uncover the practical barriers to the development of renewable energy, and help us to formulate the true ‘asks’ in regards to climate change solutions. Ultimately, the hope in undertaking this is that we will be able to solicit more help towards the

cause in the areas where it is currently lacking, and due to the urgency to address climate change, help make the goal of 100% renewable energy more attainable for everyone. While this was the general goal of the workshop, not all participants agreed on a timeframe for when 100% renewable energy should be implemented. However, we were working towards developing renewable energy further, and this is what kept us working together. This is very important to note in terms of solutions since we may not all implement solutions in the exact same way, but must agree to move in the same direction.

CSO's have the capacity (support, structure etc.) to be an influential player in the movement to increase renewable energy uptake, which is why CAN (a CSO focused on climate action) felt this campaign would be an effective use of their resources. What made the CAN workshop so different, and effective was that participants were asked to identify entry points for other organizations to join in helping with their campaigns, and this facilitated collaboration right on the spot.

Research Methodology

The workshop was a 3 step project of conducting research prior to the workshop, hosting the workshop and learning from and brainstorming with one another, and implementing the solutions we devise. The methodology undertaken for the research undertaken prior to the CAN Solutions workshop was a mix of both literature review and expert interviews. The purpose of undertaking the literature review was to collect relevant documents in line with CAN's goals and values. To accomplish this, I undertook a general search engine that generated internet research, and also deep web searches on the more tightly defined questions, for example, regarding the social acceptance of renewable energy as a climate change solution. As part of the literature review I looked at what other disciplines were writing in regards to renewable energy development, since I believe that this expanded frame of reference is especially important when looking at renewable energy policies in developing nations where formal policy may not be in place yet to promote/support renewable energy, but other areas may have policy that is helpful to the cause; For example, pollution, health and safety, employment and finance etc. all could have policies that are indirectly helpful to climate change I also conducted a more hands on literature review while consulting Mark Jacobson's California based 100% renewable energy research

team regarding any suggestions or leads they may have for us in regards to relevant literature on the topic.

In regards to the expert interviews, the purpose of conducting these was to get an idea of the viability of our 100% by 2050 goal.

Interviews Conducted:

The following experts were interviewed in preparation of the CAN Solutions Workshop:

Eric Martinot (GF Report)	**Stephan Singer** (WWF- Director Global Energy Policy)
Jeremy Moorhouse (Clean Energy Canada)	**Ansgar Kiene** (Greenpeace)
Hugo Lucas (IRENA & FES)	**Keane Gruending** (SFU Renewable Cities Communications Coordinator)
Alan Miller (Former: World Bank)	**Claire Havens** (Policy Analyst SFU)
Janet Sawin (Renewables Global Status Report)	**Christine Lins** (REN 21)

The following questions were asked to the above experts

100% renewable energy Questions:

1) Do you believe that achieving 100% renewable energy is possible? If no, why?
2) Thinking globally, what comes to mind when asked what the barriers are to reaching 100% renewable energy by 2050?
3) Where is civil society engagement needed to move us to 100% renewable energy globally (e.g. Business, Individuals, Groups)?
4) How do you envision the needed civil society movement for 100% renewable energy growing?

5) Have you seen any useful tactics for helping to get civil society involved in the renewable energy movement?
6) In your view, what can civil society organizations do to help achieve the goal of 100% renewable energy by 2050?
7) What role do you see collaboration playing in helping us to reach a goal of 100% renewable energy by 2050?
8) Do you think that communication needs to be strengthened in the renewable energy movement? If yes, how?

Questions about Barriers you face in your work:

9) What is your organization trying to accomplish in terms of helping to advance renewable energy development? /What is the goal of your campaign work?
10) What road blocks are you facing?
11) Where do you need help?
12) How could your work be strengthened from collaboration with others?
13) Where are the entry points for other organizations to join/help with your campaign?
14) Do you think your efforts/campaign could be replicated somewhere else?
15) How does your organization attempt to connect with decisions-makers?
16) (If attending) what are you hoping to gain from the Istanbul workshop with regards to your organizations work/campaign?
17) Is there anything you would want to tell a young person about how to help/get involved in the renewable energy movement? For example, is there a certain part of the puzzle that is holding up the rest?

Concluding these interviews I put together a short summary of the main points generated from the interviews and presented this to the participants at the workshop.

This research could be considered qualitative research since it is focused on people and society, however as mentioned at the workshop, it is important to translate these findings into measurable factors.

Conclusions from Literature Review

During this literature review I conducted secondary research by collecting relevant literature on both solution building and the feasibility of renewable energy as a climate change solution. I also compiled a list of critical knowledge resources to add to the knowledge database we were hoping to create as one of the outcomes of the workshop. Within the scope of this literature review I also conducted primary research which consisted of reaching out to many influential groups within academia, the NGO world, and industry in order to build on the collaboration opportunities available between their efforts.

The following points form the conclusion of the main research points identified during this literature review:

- **Centralized vs Decentralized Energy Systems**: Renewable energy is not centrally based energy, and moving away from our current centrally based structure will be difficult. A role CSO's can play in this situation is to educate the public on the benefits of having a decentralized energy system so that they can feel more motivated to encourage, and support industry as it moves in this direction.
- **Start with Achieving Efficiency- Especially in Industry:** Currently a lot of the energy we produce goes to waste (especially in transit and industrial processes) and this contributes to us having high overall energy needs. It would be much more feasible for renewables to replace our current system if we were able to decrease our usage to a more manageable amount, and a way to do this would be to reduce how much energy we waste. Once we can accomplish this, we need to keep working on efficiency- doubling all the time. We need to first reduce demand, and then work on moving to renewables. We are not going to be able to source the amount of energy we currently use from renewable sources, as we cannot power an inefficient economy on renewable energy.
- **Connect with People:** We need to connect with the people where it resonates, like waste. People don't like to waste; they don't like to waste food, money, electricity, water, or whatever it is. Person, society, and region will have different motivational factors for choosing renewable energy sources, and we need to be able to tap into these drivers.

- **The importance of Speaking with one United Voice:** Power in numbers, we must stand together. It is important to remember that the small technicalities need to be pushed aside, but we need stand together to accomplish our common goal.
- **Reframe the Problem as a Challenge:** bombard people with too much information can cripple them from taking action, so this point is important as far as avoiding burn out, and staying positive. While this may sound benign, motivation and the ability to motivate and mobilize groups of people is one of the strengths of CSO's.

Conclusions from the Expert Interviews

The following 5 key points derived from the expert interviews for CAN to consider:

1) **The Importance of Building Practical Solutions:** Don't get bogged down with particulars on how or when, but instead aim for a common goal and focus on our individual strengths and what we can each contribute.
2) **The Importance of Collaboration:** It is important to remember that no one person/group can solve this challenge on our own, so we must always be looking for ways to multiple the impacts of our efforts by collaborating/joining forces with others. Then, the best money can be spent on bringing people together, and working on collaboration as we go
3) **The Need for New Business Models:** To facilitate the proposed solutions, we will need new business models and integrated policy to support capacity development for renewable energy
4) **The Role of Knowledge Mobilization:** In order to empower individual action, we need to develop a 1 stop shop for concrete and creditable information for everyone. It should be organized so that both activists and politicians can fall back on for a concrete source that is easy to find and access, and up to date.
5) **The Importance of Outreach Activities:** Welcome conversation with new groups of people, hear different perspectives and remember what they mean to the ultimate goal. It could be very impactful to reach out to new groups of people, like Faith Organizations. (Note. this focus can be seen with the rising interest since the release of the Pope's Encyclical: e.g. see Pope's Encyclical could have a Bigger Impact Than Paris Talks Says Nasa Scientist)

The following key barriers were also identified within the expert interviews:

1) **Upfront Cost-** This is variable on the cost of other sources of energy
2) **Inaccurate Knowledge:** Uncertainty can be used as political tool for inaction, and can stifle civil change. With the nature of climate change being uncertain in terms of timeframe severity of repercussions this will be a barrier to implementing solutions
3) **Political bottleneck:** Governments and political change happens slowly. It is difficult to match the motivation of the people with the benefits from implemented solutions
4) **Lack of Capacity:** Some areas still do not have the capacity to implement large scale renewable energy solutions, even if technology and political are in inline

Final Recommendations for CAN's Role from Both the Literature Review and the Expert Interviews

One of the most influential documents I reviewed in terms of building recommendations was the Global Futures Report (Global International Energy Agency, 2010) developed largely by Professor Eric Martinot (also one of my interviewees). In this document Martinot identified the key drivers of change, and variables in determining the success of climate change strategies. I completed a crosswalk between the variables mentioned in the Global Futures Report against those that were suggested by experts during both the interview process and the workshop, and the following list was compiled. Highlighted are the most commonly mentioned variables, also posing as the variables most likely to impact solutions:

Population Growth- Population growth is important because the larger the population the more difficult it becomes to devise a strategy that will be able to sustain everyone. There is also a debate within the strategy realm on population control vs consumption control in terms of regulation	Coal, Oil, Shale, and Natural Gas Prices- This has a knock-on effect on renewable energy implementation and development since it is easier to stay where we are (no need to transition to a decentralized system). A 100% renewable energy strategy would be in a better position to succeed if it was aligned with economic goals since coal, oil, shale and natural gas prices were unfavorable.
Gross Domestic Product (GDP) - A countries GDP affects its ability to invest in new technology. To this end, developed countries	Uncertain Information- Politicians can use uncertain information as a policy tool to avoid needing to make decisions. Is there a need for

are at a greater advantage to underdeveloped countries.	more concrete information? Is it hard to find? Or is this just the nature of climate change?
Energy Efficiency and Per Capita Consumption- It is difficult to power an inefficient society, and the more efficient we can be the faster we can more towards 100 percent renewable energy; tackling the problem at its source	Nuclear Power Acceptance and Support- Nuclear power is more controversial than oil, shale etc. since it does not produce GHG's, however it has other issues like disposal. While in terms of climate change this may seem appealing, it is not advisable to switch one problem for another when there are alternatives
Renewable Energy Technology Costs- What do these costs amount to in developed vs developing nations, and what affect does this have on implementation?	Price Volatility and Demand- What affect will fluctuations in demand and price have on willingness to invest in renewable energy?
Policy Action- For the 100% renewable energy transition Integration policy is needed to help bridge the policy gaps in this new uncharted territory. There is also a need for policy action in terms of enforcement for any of the chosen climate change strategies	Carbon Prices and Taxes- When/if a country implements a carbon tax, how does this affect society's acceptance of climate change?
Fossil Fuel Subsidies and Tax Breaks- The large subsidies currently in place create an uneven playing field/market for energy making it impossible for renewable energy companies without these subsidies to compete	**Power Transmission Network Expansion: Centralized vs Decentralized** - While classic energy systems had generation at one large, central hub and dispersed it to users, a renewable energy system would have energy generation much closer to each end user, causing a need to redesign power transmission networks and grids

Energy and Investment Portfolios- Divestment from fossil fuels and investment in renewable energy is essential, so there needs to be support and encouragement for people and businesses to diversify both their energy and investment portfolios	Population and Resource Geography- Transitioning from centralized to decentralized energy networks will encourage, and enable people to disburse into more spacious areas, rather than encourage people to flock to the cities as is currently the case.
Finance Availability and Risk Return Profiles- The idea of a climate change bank was discussed at the workshop to help fund the transition to 100% Renewable Energy	**Climate Change Perception and Reality-** People's perception of climate change, and levels of skepticism can affect how responsive they are to proposed strategies

The variables that CSO's have the highest potential of influencing are:

- Climate Change Perception and Reality
- Fossil Fuel Subsidies and Tax Breaks and
- Policy Action
- Energy Efficiency and Per Capita Consumption Influencing

The way that CSO's can influence these variables is through motivating the public to influence change, and by providing supporting mechanisms for them to do this. Some recommended actions for CAN to undertake are:

- Develop a global strategy to demand action from the 2015 Paris Climate Summit by coordinating the asks of citizens globally
- Promote crowd funding opportunities to help offset the cost of converting to renewable energy.
- Promote the idea of a new improved future to motivate people, rather than stifle them with the problems
- Develop knowledge resources such as a discussion guide to help start solution oriented conversations in your hometown
- Communicate to people the important roles they can play, helping them feel empowered to act:

- Embrace and support policy makers who lead in this direction
- Become a user- consume renewable energy
- Become a Producer- take advantage of opportunities such as MicroFIT programs

- Communicate to policy makers the importance of integration policy (policy's that help other policies work together like though of businesses, transportation, and construction, design, procurement etc.) CSO's can provide knowledge resources for politicians to better understand what is needed for the transition to 100% renewable energy.

The main message that links all these recommended actions is the need to motivate people by providing the knowledge, and resources needed to do so. While this is a broad objective, the best strategy to achieve this is by learning from others who have tried and succeeded, or failed, and sharing strategies, and collaborating on successes. Some good places to start are:

- Consult people within the countries that invest the largest in renewable energy (China, Japan, UK, Germany) how do they view solutions? How do they frame the problem? Consult governments that have the top 2020 targets for renewable energy implementation like: Uruguay, Scotland, Norway, Austria, and Finland and find out why they feel this goal is important, and where did the pressure come from for this decision
- Consult brands with strong sustainability strategies: Google, Walmart (surprisingly! Will they hold to it?), Apple, Ikea, Starbucks, Facebook. Find out how what they can teach others about their success?
- Some campaigns that are in line with this goal that could benefit from the coordination of civil society organizations are: SE4ALL, Renewable Cities, Mark Z. Jacobson and 100 % renewable energy, and Solar Citizens

Outcomes from the Workshop

During the workshop the experts in the room built on the knowledge identified within the research I conducted prior to the event. While the main achievement of our time in Turkey was the agreement on behalf of the Climate Action Networks to embrace renewable energy as a campaign goal, we also identified some of the main barriers to renewable energy uptake, as well as various partnerships and collaboration efforts.

Summary of key practical barriers:

- Political will and government position on energy policy
- Perception of renewable energy potential. An example of this was that International Renewable Energy Network (IRENA) and the World Futures Council (WFC) were both active members in the workshop, while the WFC had a very ambitious goal of 100% RE by 2050, and IRENA felt 36% would be a more realistic goal. The important thing was to stay focused on the commonalities between their goals.
- Current and past investments
- Access to funding/ Influencing investments
- Negative lobbying by the fossil fuel industry
- Maintaining Autonomy- The individual organizations collaborating for 100% renewable energy need to maintain their identity, so it is important for any crosscutting documentation to maintain unbranded.
- Lack of efficiency- we cannot power an inefficient world on renewable energy
- Long term strategy requirements

Campaigns identified for collaboration or sharing of resources:

- Academy for policy makers: The World Future Council
- Influencing Investments: WWF Workshop
- Build Back Better- Response to the Tacloban Super Typhoon
- The Climate Project: Building Public Will Power
- Solar Citizens: Bringing Together Solar Rooftop Owners

From these campaigns, the main clusters of opportunities to collaborate identified were:

- Ability to put pressure on governments to create policy changes
- Facilitate building broader, stronger, and unusual alliances in support of the desired change
- Building grassroots movements and using pilot projects to inspire change
- Influencing financial flows and investments in favor of renewables to level the playing field

Summary of the general key points identified:

- Yes, CAN should take on a coordinating role in facilitating renewable energy as a climate change solution
- Everyone focus on their strengths- Always move in the direction of 100% renewable energy, but recognize that there is no one path. This diversity created a need for a strategy going forward to coordinate our efforts and identify gaps that need to be filled.
- Recognizing the common need- There is currently a shift in renewable energy uptake from the global north to the global south, and this is largely because of the flexible access offered by renewable energy systems (it is possible to power remote towns and homes with renewable energy systems).
- The importance of speaking with one united voice
- The increased need for federal policies to level the playing field in energy sector within many developed countries
- The role of CSOs should be to ensure/influence perception so that accelerated growth and development has the room to take place (this will also affect the perceived feasibility of implementation for politicians).

During the workshop I was responsible for synthesizing and making sense of everyone's input into cohesive material that we could work with each day at the conference. An example of how I did this was by putting together a slideshow for the last day of the workshop to help guide a discussion about the learning outcomes from each stage of the workshop (Appendix 3). To create this slideshow, I was trusted to use my judgement to make sense of everyone's input and form cohesive conversations points that we could build from the following day. In order to do this, I was required to have a good grasp of the information and ask clarifying questions throughout the day to each participant to ensure I could accurately plan for their success at the conference that night. Another task I was given was to map out where all the participants efforts lay in terms of renewable energy development currently, in order to identify where more efforts will be needed. While synthesizing this material, it was crucial for me to pay close attention to how I framed the problem and the task at hand. People came all around the world to have real concrete solutions develop in this workshop, and my role was to facilitate change and identify ways to interlink and encourage the execution of the identified collaboration efforts.

Conclusion

The Climate Action Network has an important role to play in aiding with global climate change solutions, and an effective way to do this is by implementing a 100% renewable energy by 2050 goal. Global renewable energy experts are on board that this is a plausible solution and there are many positive examples and starting points for this solution to take off. Collaboration and the importance of finding ways to link our solidary efforts are immensely important, and this is a role that CSO's can play. Finally, yes the experts at the workshop did agree that CAN should play a coordinating role in implementing climate change solutions, and this made our time in Turkey worthwhile and the workshop a success.

The opportunity to attend the Climate Action Networks Solution Workshop was an invaluable learning experience, allowing me to brainstorm with some of the best climate change and renewable energy experts in the world added more value to my MES degree in those three days then I could have ever imagined. The dynamic work I performed was both challenging and important, and it was amazing to see the motivation that can be drawn from bringing people together to collaborate, and this is a lesson I will never forget.

Reference List:

Listed below are the key resources I reviewed prior to the workshop, as well as some that were referenced during the workshop. This document list will also be used as the starting point for CAN's knowledge resource database.

Print/Hardcopy Literature to Build the Foundation of CAN's Renewable Energy Capacity Building Knowledge Resource
Report: The Energy Atlas Report: *IRENA*
Academic Paper: Social Acceptance of Renewable Energy: *Rolf Wustenhagen, Maarten Wolsnik, Mary Jean Burer*
Report: Socio Economic Benefits of Solar and Wind Energy: *IRENA*
Report: The Energy Report- 100% renewable energy by 2050: *WWF*
Academic Paper: Carbon reduction scenarios for 2050- An explorative analysis of public

preferences- *Patricia Allen, Tim Chatterton*
Report: Rethinking Energy: *IRENA*
Academic Paper: Ontario's Road Map to Prosperity: Developing renewable energy to its full potential: *Dr. Jose Etcheverry*
Report/Scientific Article: A Plan for a Sustainable Future (Scientific America): *Mark Z. Jacobson*
Academic Article: Business Model for Local Distribution Companies to Promote renewable energy: *Bjoern Buesing, Ming Yang*
Academic Article: No Rooftop Left Behind: *Eric Martinot*
Report: Fossil Fuel Subsidizes: *Sarah Dobson, Amin Asadollahi- Pembina Institute*
Report: The Business Case for Renewable Technologies in Ontario – *Joint paper with U of T and Toronto and Region Conservation Authorities*
Book Chapter: Climate Policy: Renewable Energy in North America: *Dr. Jose Etcheverry*
Short Interactive Paper: Renewable Energy, Sustainable Energy, and Energy Efficiency: *Dr. Jose Etcheverry*
Report: Tracking the Energy Revolution (Canada and Global Editions): *Clean Energy Canada*
Report: Renewables Global Futures Report- *REN 21*

Online Resources to Build the Foundation of CAN's Renewable Energy Capacity Building Knowledge Resource
Shell Canada : Why Businesses Should Love a Carbon Tax: http://blogs.shell.com/climatechange/2014/06/toptencarbon/
Mark Z. Jacobson's work on a 50 state plan for 100% Renewable Energy: http://go100re.net/
Skeptical Science: http://www.skepticalscience.com/
Danish Wind Power Association: Wind Policy Resources: http://www.windpowerwiki.dk/
IRENA: Global Energy Atlas Online Resources: http://globalatlas.irena.org/
Greenpeace: Renewable Energy Myths Debunked:http://www.greenpeace.org/africa/en/campaigns/Climate-change/renewable-energy-myths/-
IRENA: IRELP- Online Video Resources:

http://irelp.irena.org/home/indexMetro.aspx?PriMenuID=1&mnu=Pri
The Communication Network: Collaboration: http://www.comminit.com/global/spaces-frontpage

IV. Vignettes: Climate Solutions in Action!

The vignettes below are short, inspirational examples of international climate events that were developed to help engage people on acting towards climate change. I developed these for consideration as part of the new Environment Canada 2016-19 Canadian Sustainable Development Strategy on *Climate Change Solutions in Action*. This section applies the knowledge gained during the CAN-I workshop in Istanbul and it is intended for consideration for addition into the next sustainable development strategy of Environment Canada.

Engaging New Stakeholders!

The Pope releasing an encyclical (one of the most powerful forms of communication on behalf of the Church) on climate change is a historic event, and possibly a game changer. The Pope's document was very compelling and clear on what actions need to be taken to make changes for the better. For example, The Pope mentions that politicians, and people in authority, are currently too concerned with masking the challenge than solving it. The Pope's document was very strategic in the language chosen to connect with large numbers of people. For example, titling the document 'Our Common Home' helps to people to identify their responsibility for the environment regardless of their religious affiliation.

Renewable Energy as a Climate Change Solution

Another recent development that is crucial to mention is the Intergovernmental Panel on Climate Change's (IPCC) Report on Renewable Energy and Climate Change. This is important because this panel is in place to advocate for impactful climate solutions, and they have identified renewable energy as such (without influence from the energy industry) because it truly is an impactful solution.

Below are some highlights from the report:

IPCC Report: Renewable Energy and Climate Change

Demand for energy and associated services, to meet social and economic development and improve human welfare and health, is increasing. All societies require energy services to meet basic human needs (e.g., lighting, cooking, space comfort, mobility and communication) and to serve productive processes. Since approximately 1850, global use of fossil fuels (coal, oil and gas) has increased to dominate energy supply, leading to a rapid growth in carbon dioxide (CO2) emissions.

Greenhouse gas (GHG) emissions resulting from the provision of energy services have contributed significantly to the historic increase in atmospheric GHG concentrations. The IPCC Fourth Assessment Report (AR4) concluded that "Most of the observed increase in global average temperature since the mid-20th century is very likely due to the observed increase in anthropogenic greenhouse gas concentrations." This is very important to mention when discussing why it is so important to implement energy solutions as the foundation of a climate change solution.

Recent data confirms that consumption of fossil fuels accounts for the majority of global anthropogenic GHG emissions. Emissions continue to grow and CO_2 concentrations had increased to over 390 ppm, or 39% above preindustrial levels, by the end of 2010. Energy being something so crucial to every aspect of our lifestyle needs to be sustainable because we can't afford to lose it.

There are multiple options for lowering GHG emissions from the energy system while still satisfying the global demand for energy services. Some of these possible options, such as energy conservation and efficiency, fossil fuel switching, renewable energy, nuclear and carbon capture and storage (CCS) were assessed. A comprehensive evaluation of any portfolio of mitigation options would involve an evaluation of their respective mitigation potential as well as their contribution to sustainable development and all associated risks and costs.

As well as having a large potential to mitigate climate change, renewable energy can provide wider benefits. Renewable energy may, if implemented properly, contribute to social and economic development, energy access, a secure energy supply, and reducing negative impacts on the environment and health. This is a message this needs to be communicated more broadly.

Under most conditions, increasing the share of renewable energy in the energy mix will require policies to stimulate changes in the energy system. Deployment of renewable energy

technologies has increased rapidly in recent years, and their share is projected to increase substantially under most ambitious mitigation scenarios. Additional policies would be required to attract the necessary increases in investment in technologies and infrastructure. This is important to note when building and planning for solutions.

V. Sustainable Canada Dialogues- Acting on Climate Change: Solutions from Canadian Scholars

During my time at York University, I had the privilege of learning about the development of a ground-breaking document on climate change action written by a group of Canadian Academics through an organization called Sustainable Canada Dialogues. When it was finally released during the Americana Conference in Montreal in March of this year I was working for Environment Canada on the Sustainable Development Strategy's Climate Action Team. This gave me an excellent opportunity to coordinate the work I was doing with York and with that of Environment Canada, aiding my research to becoming valuable something bigger. It also presented me with a unique opportunity to bring the document to the attention of Environment Canada, who then asked me to create a Memorandum to the Director of our Directorate to introduce her to the document. The memo is as follows:

MEMORANDUM TO THE DIRECTOR

ACTING ON CLIMATE CHANGE- SOLUTIONS FOR POLICY MAKERS FROM CANADIAN SCHOLARS

For Information

SUMMARY

- The document '*Acting on climate change- Solutions from Canadian Scholars*' serves to inform policy at all levels of Government about steps that can be adopted immediately to link climate change to the broader Canadian Sustainable Development (SD) agenda.

- This report was released at the Americana Conference held in Montreal in March, and has received high profile coverage from all major Canadian newspapers since.
- The authors highlight ten policy recommendations to advance sustainable development in Canada, including putting a price on carbon, lowering the GHG emissions in energy sectors (oil and gas, electricity generation), eliminating oil and gas subsidies and promoting a national strategy for lower emission transportation.
- This paper shines a light on the importance of the Paris Climate summit as an opportunity to revisit national targets and profile new goals.
- This document indicates that there is support from the academic community to develop a national goal for climate change

NOTE

- One of the authors of this paper is an academic advisor commonly used by Environment Canada: Dr. J. Meadowcroft from Carleton University

REVIEWED BY:

Aimee Johnston	Paula Brand
Manager	Director

c.c.: Tanya Bryant- Senior Policy Advisor

BACKGROUND

In the fall of 2014 UN Secretary Ban Ki-Moon called on all countries to raise the ambition of their climate change strategies to avoid a temperature rise of more than 2 degrees this century. In response to this, a group of 28 Canadian academics collaborated to produce a report titled Acting on climate change- Solutions from Canadian Scholars. This document serves to inform

policy at all levels of Government about steps that can be adopted immediately to link climate change to the broader Canadian Sustainable Development (SD) agenda.

The academics that authored this work provide a scholarly consensus on how to motivate, change, and help Canada in its necessary transition toward a low carbon economy by mobilizing Canadian expertise, and fostering public discussion. The scholars chosen represent climate change expertise from every area, ranging from engineering to sociology. The question that was asked to each scholar which formed the basis of this paper was as follows:
"Bearing in mind the upcoming federal elections and the United Nations Climate Change conference, Paris 2015, what key recommendations/solutions do you think Sustainable Canada Dialogues could propose to Canadian Policy Makers to foster Sustainable Development in Canada?"

Media Remarks:

Globe and Mail: This report has received extensive support from policy makers, scientists, and others because it focuses on solutions that are achievable and provides a sound basis for federal and provincial policy development.

The Guardian Newspaper: The time has come to accelerate the transition towards a low carbon society ensuring that the next generation of Canadians can inherit a productive economy with high social wellbeing standards, live in sustainable cities, and enjoy Canada's unique wildlife, pristine lakes, and ice capped mountains. For that world to be ours tomorrow, we must act today. (Catharine Potvin- Lead Academic)

Ten Policy Recommendations:

- *Put a price on carbon*- Adopt either a carbon tax or a cap and trade program
- *Include federal goals for low carbon electricity production in federal climate change plans*- A clear climate policy accompanied by a federal goal will increase certainty in Canada's business environment, while simultaneously increasing the confidence of the provinces and the private sector to be able to move into this direction. The recommended federal target is an 80% reduction in GHG by mid-century, and the complementary short term goal for this is a 26-28 % reduction by 2025

- *Integrate the oil and gas production sector into climate policies*- Eliminate all direct or indirect subsidies to the fossil fuel industry to eliminate the barriers to new technologies becoming competitive.
- *Adopt a multi-level energy policy with energy efficiency and cooperation in electrification at its core*- Invest in building capacity and smart grid infrastructure

- *Throughout Canada rapidly adopt low carbon transportation strategies*-Including promotion of Active Transportation, electric road transport, and intermodal/rail expansion
- *Integrate infrastructure planning policies at multiple scales to ensure climate change mitigation*- Green infrastructure and smart growth city planning
- *Support the evolution of the building and energy sector*s- In terms of how policies support weapon and other support labourers in post war situations to transition to the new economy
- *Safeguard biodiversity and water quality during the transition to a low-carbon society*
- *Support fisheries, forestry, and agriculture practices offering to limit GHG production*
- *Facilitate the transition by opening more participatory and open governance structure*
- Outlines the special challenges that Canada faces in terms of pursuing sustainable development given our location, resources, and culture etc. For example: Energy security is a non-issue in Canada, but GHG associated with energy development is an issue

Link to website for more information: Sustainable Canada Dialogues

VI. Portfolio Conclusion:

This portfolio documents my work as a researcher activist under several professional settings and provides a glance at the complexity behind the barriers to implementing climate change solutions, as well as identified key aspects or the 'sacred cows' of any solution that will be implemented. My key goal was to demonstrate how I am applying the knowledge that I have gained on my quest for solutions to climate change during my time at FES, and the huge accomplishment I achieved in my journey of helping to show the Climate Action Network the benefits of embracing the 100% Renewable Energy goal as one of their campaign objectives. It

was because of this experience I was able to secure an internship, and then also a full-time position within Environment Canada as a Climate Change Policy Analyst. It was the practical aspect of my degree that was the most rewarding, as I feel that is what environmental studies is all about.

I chose a portfolio to attempt to highlight the many different aspects of climate changes solutions that I have explored, and this portfolio provides an overview of the many manifestations that my work on using renewable energy as a climate change solution is taking, and also a snapshot of how knowledge mobilization takes shape during activist interventions. Therefore, the portfolio provides not a comprehensive and definitive research report but instead several ‘vignettes” of activist interventions on which I was and continue to be deeply involved on. The journeys summarized in the portfolio contain some victories (which are essential fuel for activists to be able to continue challenging the status quo e.g. convincing the Climate Action Network International to focus on 100% renewable energy) and my ongoing struggle to work effectively inside of a highly hierarchical organization (i.e. Environment Canada) that is under severe stress due to the prevalent views of its current political masters.

My hope is that as political change arrives to Ottawa the work that I started at FES can continue to blossom and I can continue to provide even a small contribution to address climate change. I hope to continue my research on this topic, with the new overarching focus on international security issues resulting from resource management.

Bibliography

Broome, J. (2014). The Ethics of Climate Change: Pay Now or Pay More Later. Available: http://www.scientificamerican.com/article/the-ethics-of-climate-change/. Last accessed April 8th, 2014.

Clean Energy Canada. (2014). Tracking the Energy Revolution. *Global Edition*.

Clean Energy Canada. (2014). Tracking the Energy Revolution. *Canada Edition*.

Dauncey, G (2009). The Climate Challenge. Canada: New Society Publishers. 2-74.

Dearden, P (2009). Parks and Protected Areas in Canada. 3rd Ed. New York: Oxford. 15-16, 75-79,103-105,304-305.

Etcheverry, J. York University. The Significance of Climate Change Lecture. April 4th, 2014.

Gardiner, S. (2013). Ethics and Global Climate Change. Available: http://www.nature.com/scitable/knowledge/library/ethics-and-global-climate-change-84226631. Last accessed March 2nd, 2014.

Hardin, G. (1968). Tragedy of the Commons. Available: http://www.garretthardinsociety.org/articles/art_tragedy_of_the_commons.html. Last accessed March 2nd, 2014.

Higuchi, K. 2014. Analyzing Climate Change Science. [Lecture to ENVS 6179 Climate Change: Science and Policy]. York University, 21 January 2014.

Holy Father Francis. (2015). *Our Common Home.* Available: http://w2.vatican.va/content/francesco/en/encyclicals/documents/papa-francesco_20150524_enciclica-laudato-si.html. Last accessed 4th August 2015.

Hoggan, J. (2014). Years of Living Dangerously. Available: http://www.desmogblog.com/. Last accessed April 3rd, 2014.

International Panel on Climate Change, 2012: Managing the Risks of Extreme Events and Disasters to Advance Climate Change Adaptation. A Special Report of Working Groups I and II of the Intergovernmental Panel on Climate Change [Field, C.B., V. Barros, T.F. Stocker, D. Qin, D.J. Dokken, K.L. Ebi, M.D. Mastrandrea, K.J. Mach, G.-K. Plattner, S.K. Allen, M. Tignor, and P.M. Midgley (eds.)]. Cambridge University Press, Cambridge, UK, and New York, NY, USA, 582 pp.

Intergovernmental Panel on Climate Change (IPCC). (2013). Climate Change 2014: Impacts, Assessments, and Vulnerabilities. *IPCC Working Group*. Firth Assessment Report. Part 2.

Intergovernmental Panel on Climate Change (IPCC). (2014). Climate Change 2014: Impacts, Assessments, and Vulnerabilities. *IPCC Working Group*. Firth Assessment Report (Summary for Policy Makers), 1-32.

IPCC, 2007: Climate Change 2007: The Physical Science Basis. Contribution of Working Group I to the Fourth Assessment Report of the Intergovernmental Panel on Climate Change [Solomon, S., D. Qin, M. Manning, Z. Chen, M. Marquis, K.B. Averyt, M.Tignor and H.L. Miller (eds.)]. Cambridge University Press, Cambridge, United Kingdom and New York, NY, USA.

Miskisic, K- NASA. (2015). *Eyes on the Earth.* Available: http://climatekids.nasa.gov/. Last accessed August 2nd, 2015.

Mulgan, T (2011). Ethics of a Broken World. London: Acumen Publishing. 7-35.

National Association of Clean Air Agencies. (2011). Primer on Climate Change Science. Available: https://moodle.yorku.ca/moodle/pluginfile.php/818410/mod_resource/content/1/NACAAClimateSciencePrimerpost.pdf. Last accessed Feb 14, 2014.

NRDC. (2005). *Global Warming Puts the Arctic on Thin Ice.* Available: http://www.nrdc.org/globalwarming/qthinice.asp. Last accessed June 12th 2015.

Rock Ethics Institute. (2014). Ethics in Climate Change. Available: http://rockethics.psu.edu/climate/. Last accessed April 7th, 2014.

Rotman, D. (2014). The Real Causalities of the Global Warming Problem. Available: http://www.technologyreview.com/review/513526/climate-change-the-moral-choices/. Last accessed April 1st, 2014.

Sustainable Canada Dialogues. (2015). Acting on Climate Change. *Solutions for Canadian Scholars*. Full and Summary Versions. Release Date: March 2014

Swim, J. (2014). Psychology and Global climate change. Available: http://www.apa.org/science/about/publications/executive-summary.pdf. Last accessed April 6th, 2014.

Timmerman, P. York University. Climate change Ethics Lecture. February 13th, 2014

Trenberth, K. (2006). In: Lovejoy, T. Hannah, L. Climate Change and Biodiversity. The Energy and Resource Institute. 15-30.

United Nations. (2014). *World Food Program.* Available: http://www.wfp.org/. Last accessed July 18th 2015.

U.S. EPA. EPA's Report on the Environment (ROE) (2008 Final Report). U.S. Environmental Protection Agency, Washington, D.C., EPA/600/R-07/045F (NTIS PB2008-112484), 2008.

World Wildlife Federation. (2009). *Global Warming and Extreme Weather*. Available: https://www.nwf.org/Wildlife/Threats-to-Wildlife/Global-Warming/Global-Warming-is-Causing-Extreme-Weather/Extreme-Weather-and-Climate-Justice.aspx. Last accessed June 12th, 2015.

Appendix 1: Overview of Experts Interviewed and Questionnaire Used

Human Risk form from Dossier

Status Currently: Published

HPRC

Details

Purpose of Research:

MES Major Research

Title of Research:

Interviews for the CAN International renewable energy Solutions Research

Term:

Fall

Year:

2014

Supervisor / Course Director

Jose Etcheverry

Email:

rejose@yorku.ca

Funded Research / Minimal Risk

1) Is the research you are conducting "funded"?

No

2) Are the risks to participant's more than minimal risks?

No

Informed Consent

3) Will you provide a full explanation of the research to the participants prior to their participation?

Yes

4) Is substitute consent involved (i.e. for children, youth under 16, incompetent adults)?

No

5) Is deception involved?

No

6) Will individuals be instructed that they can/will remain anonymous?

Yes

7) Will the data be kept confidential?

Yes

How will informed consent be obtained?

Oral information on project followed by oral consent (permissible only in extenuating circumstances, where written communication is not feasible; script of the oral informed consent statement must be provided

Certificate of Completion:

PANEL ON RESEARCH ETHICS

TCPS 2: CORE

Certificate of Completion

This document certifies that

BRANDON CORMIER

has completed the Tri-Council Policy Statement: Ethical Conduct for Research Involving Humans Course on Research Ethics (TCPS 2: CORE)

Date of Issue: **22 November, 2014**

Written Informed Consent Document:

Below is the oral consent that will be spoken to the participant prior to the interviews:

Thank you for taking the time to hold an interview with us today.

We are conducting this interview as part of our research for the Climate Action Network's Solutions Workshop taking place in Istanbul from October 8th to October 10th 2014. We are planning to focus our days in Istanbul on learning and sharing strategies and tactics to overcome barriers that are in the way of 100 % renewable energy and discuss what kind of platform is needed to strengthen collaboration and coordination between CSOs working on solutions to increase the effectiveness of our work further. What we are looking to gain from this interview is to try and understand your thoughts towards the idea of 100% renewable energy, and from your perspective, what do you see as the main road blocks? This will help us understand what the

practical barriers are to the development of renewable energy, and help us to formulate the true 'asks'. We want to get a sense of what you feel is needed to help advance your work forward, so that we can incorporate this knowledge into a GAP analysis for the renewable energy movement globally. Ultimately, we hope in doing this that we will be able to solicit help in the areas where it is needed most, to help make the goal of 100% renewable energy more attainable for everyone. To clarify, your name and credentials will be kept anonymous, the results of all the interviews we are conducted will be concluded into 5 reoccurring points, and used to inform my research project

Specific Research Project Goal:

To research where the gaps are in terms of civil society mobilization of renewable energy (renewable energy), given the urgency to address climate change. I will highlight where we should be in terms of renewable energy uptake globally to reach a goal of 100 % renewable energy worldwide by 2050. Focusing my research in this direction prior to the CAN workshop will allow me to highlight where CAN's efforts are needed to help establish a global infrastructure to facilitate, and expedite, renewable energy uptake to help 100% renewable energy become an attainable and desirable goal for everyone.

Interview Questions:

100% renewable energy:

1) Do you believe that achieving 100% renewable energy is possible? If no, what reason?

2) Thinking globally, what comes to mind when asked what the barriers are to reaching 100% renewable energy by 2050?

3) Where is civil society engagement needed to move us to 100% renewable energy globally (e.g. Business, Individuals, Groups)?

4) How do you vison the needed civil society movement for 100% renewable energy growing?

5) Have you seen any useful tactics for helping to get civil society involved in the renewable energy movement?

6) In your view, what can civil society organizations do to help achieve the goal of 100% renewable energy by 2050?

7) What role do you see collaboration playing in helping us to reach a goal of 100% renewable energy by 2050?

8) Do you think that communication channels needs to be strengthened within the renewable energy movement? If yes, in what ways?
9) What is your organization trying to accomplish in terms of helping to advance renewable energy development/ what is the goal of your campaign work?
10) What road blocks are you facing?
11) Where do you need help?
12) How could your work be strengthened from collaboration with others?
13) Where are the entry points for other organizations to join/help with your campaign?
14) Do you think your efforts/campaign could be replicated somewhere else?
15) How does your organization attempt to connect with decisions-makers?
16) What are you hoping to gain from the Istanbul workshop with regards to your organizations work/campaign? (If attending)
17) Is there anything you would want to tell a young person about how to help/get involved in the renewable energy movement? For example, is there a certain piece of the puzzle that is holding up the rest that you would encourage us to get involved with?

Participant Selection:

The experts indicated below have been chosen for interviews for my research project.
For context, my supervisor conducted interviews with these professionals prior to the CAN Solutions Workshop back in October. Now I will be contacting them again for a follow-up interview now that the workshop has commenced. The idea behind interviewing a second time is to understand how the outcomes made effective during the workshop have affected their work, and what they still need to change in order for their efforts in the 100% renewable energy movement to have optimum impact. This information will help me to build a gap analyst for the 100% renewable energy movement.

The below chart outlines the name, title, and reason why each person was chosen as for an interview:

Stephan Singer (WWF-Director Global Energy Policy)	Stephan was chosen as one of my interviewees because of his work within WWF's 100% renewable energy by 2050 campaign - Replicable ideas?

Ansgar Kiene (Greenpeace)	Ansgar is the energy campaign coordinator at Greenpeace, and I felt he was important to interview about his experience mobilizing people towards energy equity issues. -Replicable ideas?
Keane Gruending (SFU Renewable Cities Communications Coordinator)	I was interested to learn from Keane valuable information about the details for implementation, and technical plausibility about the 100% renewable energy goal based on his work with the Simon Fraser University based renewable cities endeavor. -Replicable ideas?
Claire Havens (Policy Analyst Simon Frasor University)	Claire was interviewed for an update on renewable energy acceptance within the city of Vancouver, as well as suggestions for planning an engaged workshop in Turkey, and how to follow up effectively.
Christine Lins (REN 21)	Christine was chosen to gain a perspective from the renewable energy Network (REN21) about the role they can/are playing, and the road blocks they face.
Eric Martinot (GF Report)	Eric is an exceptionally important person on this interview list, since he conducted research for a famous report in the world of renewable energy called the Global Futures report where he interviewed people all over the globe about their acceptance of renewable energy, and the plausibility of the 100% renewable energy goal. Eric therefore completed the introductory research leading up to mine, and was an asset to interview.
Jeremy Moorhouse (Policy Analyst- Clean Energy Canada)	Jeremy was chosen for is work helping to develop the Clean Energy Canada's Tracking the Energy Revolution report. This report outlined where we are currently in regards to 100% renewable energy update vs where we should be.
Clare Demerse (Policy	Clare was chosen for her article in the Globe and Mail

Analyst- Clean Energy Canada)	regarding media coverage on the 100% renewable energy movement, and insights on public opinion.
Hugo Lucas (soon to be FES Professor!)	Hugo was chosen for his insight to project implementation from his work with the International renewable energy Agency
Alan Miller (Former World Bank)	Alan was chosen to solicit advice on the feasibility of a global climate fund/or a global renewable energy fund
Janet Sawin (Renewables Global Status Report)	Janet Sawin has been working in the renewable energy industry for many years and also helped to write the global status report which helped to set the stage for this research project. She was chosen for her insights and advice on how to move forward with this plan was very helpful.
Kaz Higuchi (Climate Scientist & Professor)	Dr. Higuchi will be interviewed on his vision for our energy future from the perspective of meeting energy demand, while also reducing carbon emissions
Tom Du- Financial Analyst	Tom is a former MES student and was chosen for an n interview in regards to his major research at FES with energy planning. I hope he can give a realistic view on implementing solutions from a financial standpoint.

Checklist

1) Have you provided contact information for yourself as the researcher (your name, telephone number, email address, status BES/MES student)? All research must be explicitly linked to York University and the Faculty of Environmental Studies.

Yes

2) Have you included a brief description of the purpose/rationale of the study? This will describe for participants why the research is being conducted and what the researcher is looking to achieve.

Yes

3) Have you included a brief description of the study design? This will indicate what participants are expected to do and the required time commitment.

Yes

4) Have you included a brief description of the potential risks and discomforts to the participants and applicable mitigation methods?

Yes

5) Have you included any benefits of the research and benefits to participants, if there are any? This may contribute to why people may choose to participate in your research.

Yes

6) Have you indicated whether and what incentives, if any, are offered to participants and why?

Yes

7) Have you included statements of the following? (As applicable):

i) Participation in the study is completely voluntary and participants have the right to withdraw at any time.

Yes

ii) Should a participant withdraw from the study, all data generated as a consequence of their participation shall be destroyed.

Yes

iii) Participants have the right not to answer questions.

Yes

iv) Indicating how the research will be presented or reported? For example, "This research is part of my MES Major Research". If your research may be used beyond your current academic work, please indicate.

Yes

8) Have you described the methods by which confidentiality and anonymity will be attained and maintained? Indicate if the interviewing or recording of the participant will be associated with identifying information.

Yes

9) Have you described the storage method, length of retention and disposal method of all data gathered during the study? Researchers are required to keep consent forms for a minimum of two years following completion of the study.

Yes

10) Have you included a statement indicating that the research has been reviewed and approved by the FES Human Participants Research Committee on behalf of York University?

Yes

11) Have you provided contact information for participants should they have any questions for the Senior Manager & Policy Advisor for the Office of Research Ethics, 5th floor, York Research Tower, York University, 416-736-5914 or ore@yorku.ca

Yes

12) Have you included a signature line and a date line for participants if a written consent form is being used?

N/A

13) Have you included a signature line and a date line for yourself as researcher if either a written consent form or letter is being used?

N/A

14) If the research involves a written questionnaire or a survey, have you attached the survey to the application?

Yes

15) If the study involves the use of a minor, have you included:

i) A separate information letter to the parents of the minor?

N/A

ii) A separate parental permission letter which is to be attached to the minor's letter of consent?

N/A

iii) A signature line for the parent/guardian of the minor?

N/A

iv) A line for the parent/guardian to indicate their relationship to the minor?

N/A

Approval Process Questions from Professors

<u>Q: Clarify Consent Process</u>

B. Cormier

Thank you very much for taking the time to review my request, and I am sorry that the process I plan to undertake to do so was not presented more clearly in my application.

I do plan on emailing the selected interview participants prior to the interview to request their consent. In this email, I plan to explain the particulars about the interview request to make sure they are comfortable with everything, and ask them for a suitable time to conduct the interview. I should also clarify for context that the interviewees selected are from organizations that are members of the Climate Action Network International and therefore are very familiar with this project, and the interview should not come across as a cold call/have that feel.

Please let me know if this helps to answer your question and/or if more information is needed.

Q: Clarify why oral consent was chosen over written

Oral consent was chosen for the below reasons:

1) Greater ability to secure an interview- The professionals I have chosen for this interview series are busy and therefore not happy to do paperwork. This was proven in the pre-workshop interviews conducted by my supervisor where we asked if they would look at some paperwork for us and everyone declined doing so.

2) Suitability- Since this is a low risk interview giving full disclosure and taking place over the phone oral consent is more suitable than written consent.

Appendix 2: Terms Central for Understanding

Climate change: Climate change refers to a change in the state of the climate that can be identified (e.g., by using statistical tests)

By changes in the mean and/or the variability of its properties, and that persists for an extended period, typically decades or longer.

Climate change may be due to natural internal processes or external forces such as modulations of the solar cycles, volcanic eruptions, and persistent anthropogenic changes in the composition of the atmosphere or in land use. Note that the Framework

Convention on climate change (UNFCCC), in its Article 1, defines climate change as: "a change of climate which is attributed directly or indirectly to human activity that alters the composition of the global atmosphere and which is in addition to natural climate variability observed over comparable time periods." The UNFCCC thus makes a distinction between climate change attributable to human activities altering the atmospheric composition, and climate variability attributable to natural causes.

Vulnerability: The propensity or predisposition to be adversely affected. Vulnerability encompasses a variety of concepts and elements including sensitivity or susceptibility to harm and lack of capacity to cope and adapt.

Impacts: Effects on natural and human systems. In this report, the term impacts are used primarily to refer to the effects on natural and human systems of extreme weather and climate events and of climate change. Impacts generally refer to effects on lives, livelihoods, health, ecosystems, economies, societies, cultures, services, and infrastructure due to the interaction of climate changes or hazardous climate events occurring within a specific time period and the vulnerability of an exposed society or system. Impacts are also referred to as consequences and outcomes. The impacts of climate change on geophysical systems, including floods, droughts, and sea level rise, are a subset of impacts called physical impacts.

Risk: The potential for consequences where something of value is at stake and where the outcome is uncertain, recognizing the diversity of values. Risk is often represented as probability of occurrence of hazardous events or trends multiplied by the impacts if these events or trends

occur. Risk results from the interaction of vulnerability, exposure, and hazard (see Figure SPM.1). In this report, the term risk is used primarily to refer to the risks of climate-change impacts.

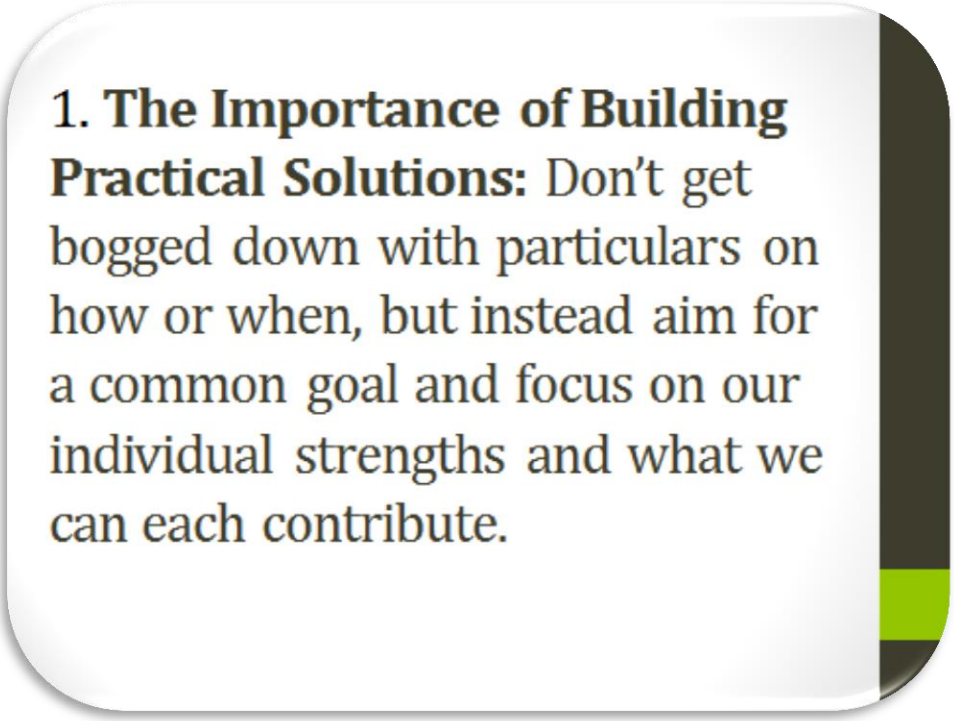
Adaptation: The process of adjustment to actual or expected climate and its effects. In human systems, adaptation seeks to moderate or avoid harm or exploit beneficial opportunities. In some natural systems, human intervention may facilitate adjustment to expected climate and its effects.

Transformation: A change in the fundamental attributes of natural and human systems. Within this summary, transformation could reflect strengthened, altered, or aligned paradigms, goals, or values towards promoting adaptation for sustainable development, including poverty reduction.

Resilience: The capacity of social, economic, and environmental systems to cope with a hazardous event or trend or disturbance, responding or reorganizing in ways that maintain their essential function, identity, and structure, while also maintaining the capacity for adaptation, learning, and transformation.

(IPCC SPM 2014 Climate Change Impacts, Adaptation and Vulnerability)

Appendix 3 – Matrix PowerPoint Presentation- CAN Solutions Workshop



2. **The Importance of Collaboration:** It is important to remember that no one person/group can solve this challenge on our own, so we must always be looking for ways to multiple the impacts of our efforts by collaborating/joining forces with others. Then, the best money can be spent on bringing people together, and working on collaboration as we go

3. **The Need for New Business Models:** To facilitate the proposed solutions, we will need new business models and integrated policy to support capacity development for renewable energy

4. The Role of Knowledge Mobilization: In order to empower individual action, we need to develop a 1 stop shop for concrete and creditable information for everyone. It should be organized so that both activists and politicians can fall back on for a concrete source that is easy to find and access, and up to date.

5. The Importance of Outreach Activities: Welcome conversation with new groups of people, hear different perspectives and remember what they mean to the ultimate goal. It could be very impactful to reach out to new groups of people, like Faith Organizations.

Key Points from Panel and Working Groups Day 1

Co-Benefits of RE

- Energy Security
- Food Security
- Waste
- Water
- Jobs
- Peace
- Affordable… lots of other things!

Campaign Opportunities

- Frame Around What People Care About
- Influence Financial Institutions with Case of Outdated Business Model
- Pushing for RE in the SDG's
- New Fund for RE Development
- Umbrella/Over Arching Campaign

Collaboration Ideas

- Information knowledge and experience sharing
- - Library (business cases, success stories)
- - Learning from victories
- - Youtube channel/Interactive map of RE initiatives
- RE Capacity Building Academy
- International Renewable Energy Fund
- Create a solid cost benefit analysis
- NGO's Walk the Talk for RE (QUALITY RE)
- Bring social and environmental movements together
- Speed Up. How? People Power!

Results from Working Groups

CAN Solutions Workshop

October 9th 2014

Question 1- Supporting Efforts Moving Forward- What Does Already Exist?

- 1 Million Climate Jobs
- India Eco Village Experience
- Christian Aid- Reports on South Africa and Latin America
- Sierra Club Initiatives
- Planningtowin.org and Planningtown.org
- COP 20 & 21
- CAN Talks
- 100% RE Website
- REN 21 and REN 21 Interactive Map
- WEDO
- The Climate Reality Project
- Dailyclimate.org Newsletter
- And many More!

Question 2- How Can Skills Be Shared?

- Online Library
- Translate into more Languages
- Comic Strips for Children
- Local Media Coverage
- Study Tours
- Web Seminars
- Brand Ambassadors
- Alliances with CSO's, Academia, and Philanthropy

Question 3- What Services Are Needed?

- Wikipedia site (or similar) that allows for editing, adding and searching for information - We need to start without assumptions, consistent and long-term
- Raise funds online
- Success stories map- Business cases, personal stories, community stories
- Strategic Working Groups with RE Experts
- CAN Bank
- List Serv
- Energy Tool Kit
- Scholar Research List
- Spread Sheet on Activities

Question 3 – What Services Are Needed? Continued

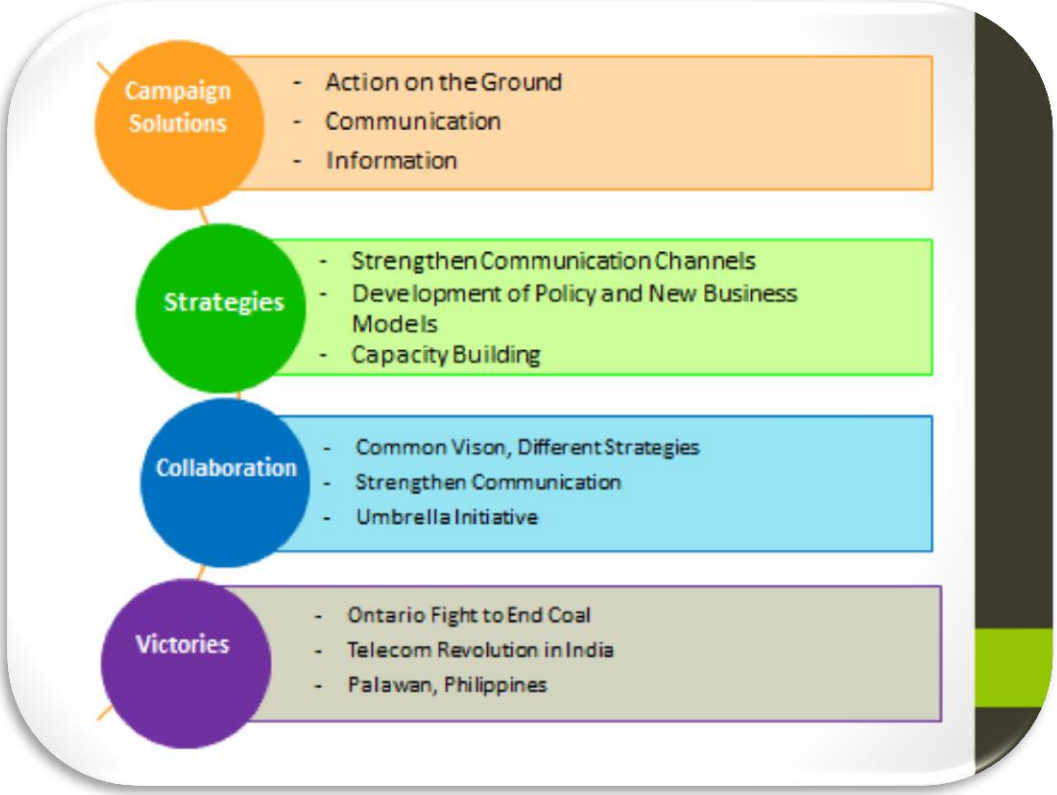
- Spread sheet on best literature *
- Encouraging 1 page paper on vision
- Outreach Paper to other CSO's
- Gap Analysis of other CSO Activities and Opportunities to Engage
- Success Stories Translated into Numbers
- Concrete and Replicable Business Models
- Funded in-person meetings, then move to online meetings after. Face-to-Face is very important initially as it sparks Co-ordination
- Iconic RE projects within CSO's

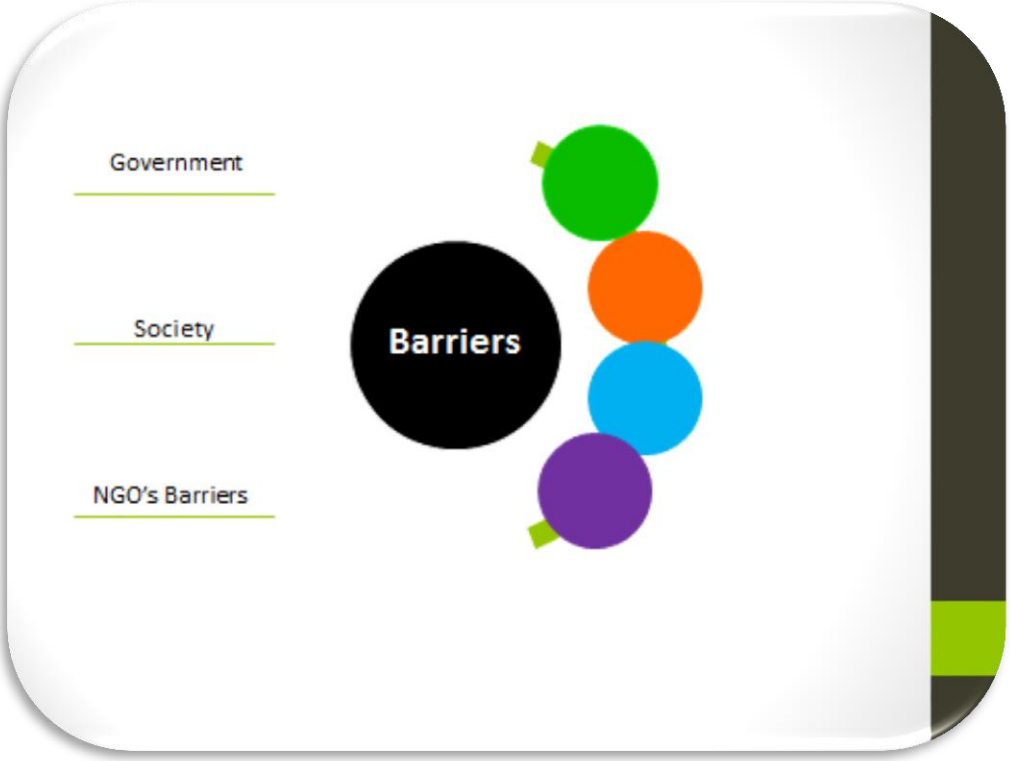
Shared Solution Matrix

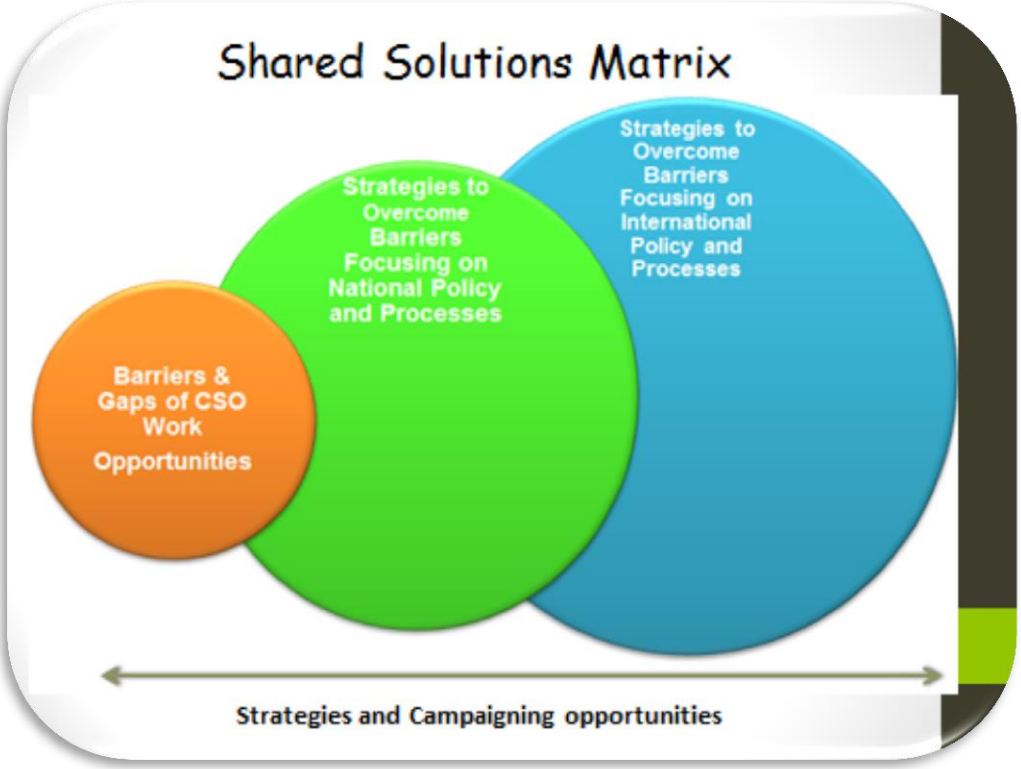
CAN Solutions Workshop

October 10th 2014


Strategies
Victories
Barriers
Campaign Opportunities
Collaboration


Campaign Solutions
- Action on the Ground
- Communication
- Information
Strategies
- Strengthen Communication Channels
- Development of Policy and New Business Models
- Capacity Building
Collaboration
- Common Vison, Different Strategies
- Strengthen Communication
- Umbrella Initiative
Victories
- Ontario Fight to End Coal
- Telecom Revolution in India
- Palawan, Philippines

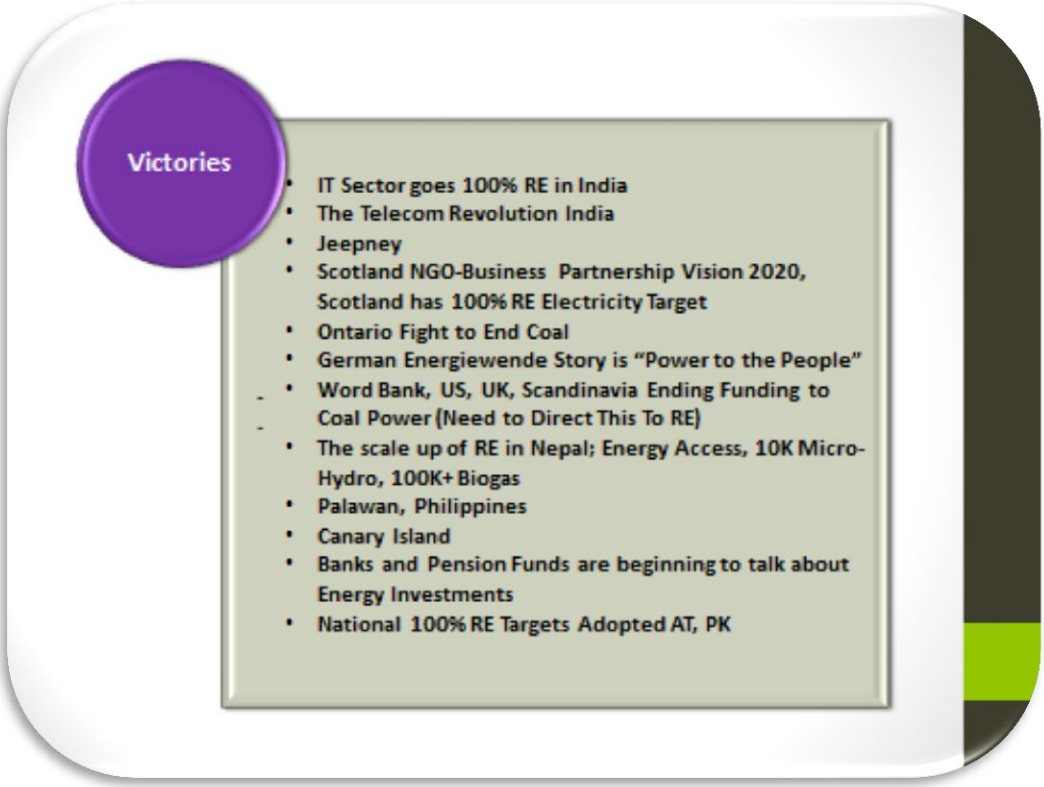

Government
Society
NGO's Barriers
Barriers

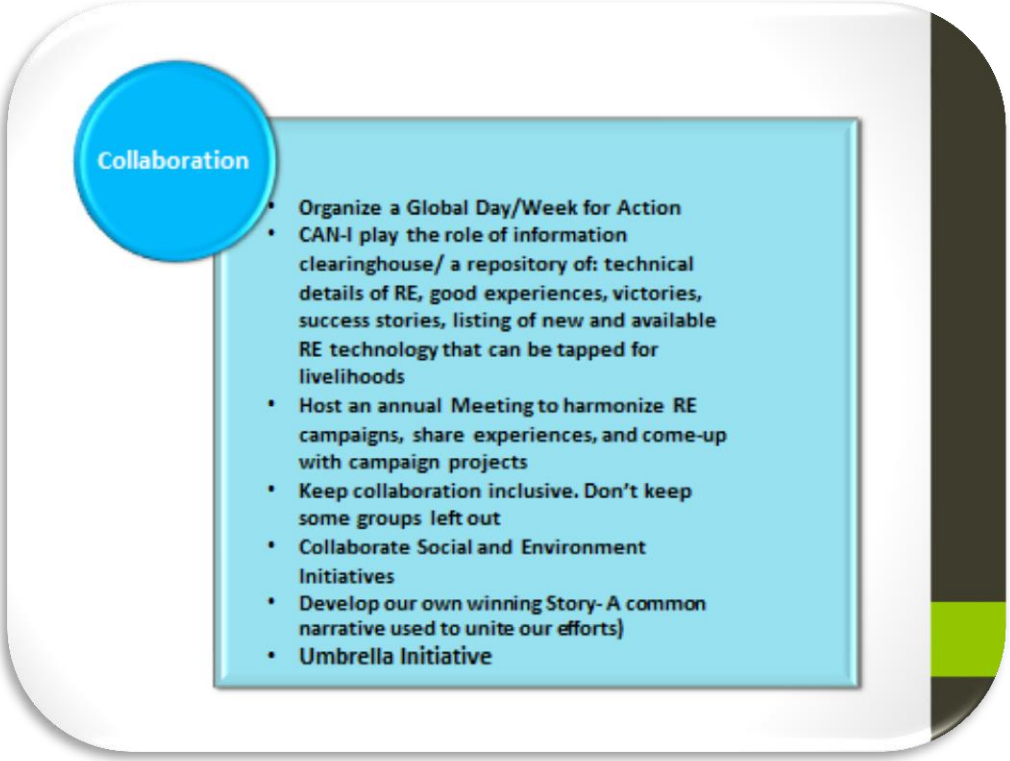

Shared Solutions Matrix
Strategies to Overcome Barriers Focusing on International Policy and Processes
Strategies to Overcome Barriers Focusing on National Policy and Processes
Barriers & Gaps of CSO Work
Opportunities
Strategies and Campaigning opportunities


Strategies
Victories
Barriers
Campaign Opportunities
Collaboration


Barriers
Government
• Corruption
• Lack of Capacity
• Lack of Knowledgeable Politicians and Governments about RE Potential
• Lack of Political Will
• Need for Systemic Change
• Centralized Authoritarian Planning
Society
• Knowledge- Lack of Concrete and Concise Information, i.e.: Potential for Job Creation
• Lock in of Mind Sets/Perception
• Communities Stranded on the Grid (i.e.: Disadvantaged)


Barriers Cont.
NGO's Barriers
Communication
Lack of Visibility
Fragmented and Uncoordinated Efforts
Utility Companies Resisting Change/ Interests of Fossil Fuel Lobbies
Fossil Fuels still make an Economic Difference
Need to Gain Momentum- Challenge BAU
Scarce Resources in terms of Financial and others


Victories
IT Sector goes 100% RE in India
The Telecom Revolution India
Jeepney
Scotland NGO-Business Partnership Vision 2020, Scotland has 100% RE Electricity Target
Ontario Fight to End Coal
German Energiewende Story is "Power to the People"
Word Bank, US, UK, Scandinavia Ending Funding to Coal Power (Need to Direct This To RE)
The scale up of RE in Nepal; Energy Access, 10K Micro-Hydro, 100K+ Biogas
Palawan, Philippines
Canary Island
Banks and Pension Funds are beginning to talk about Energy Investments
National 100% RE Targets Adopted AT, PK


Collaboration
Organize a Global Day/Week for Action
CAN-I play the role of information clearinghouse/ a repository of: technical details of RE, good experiences, victories, success stories, listing of new and available RE technology that can be tapped for livelihoods
Host an annual Meeting to harmonize RE campaigns, share experiences, and come-up with campaign projects
Keep collaboration inclusive. Don't keep some groups left out
Collaborate Social and Environment Initiatives
Develop our own winning Story- A common narrative used to unite our efforts)
Umbrella Initiative

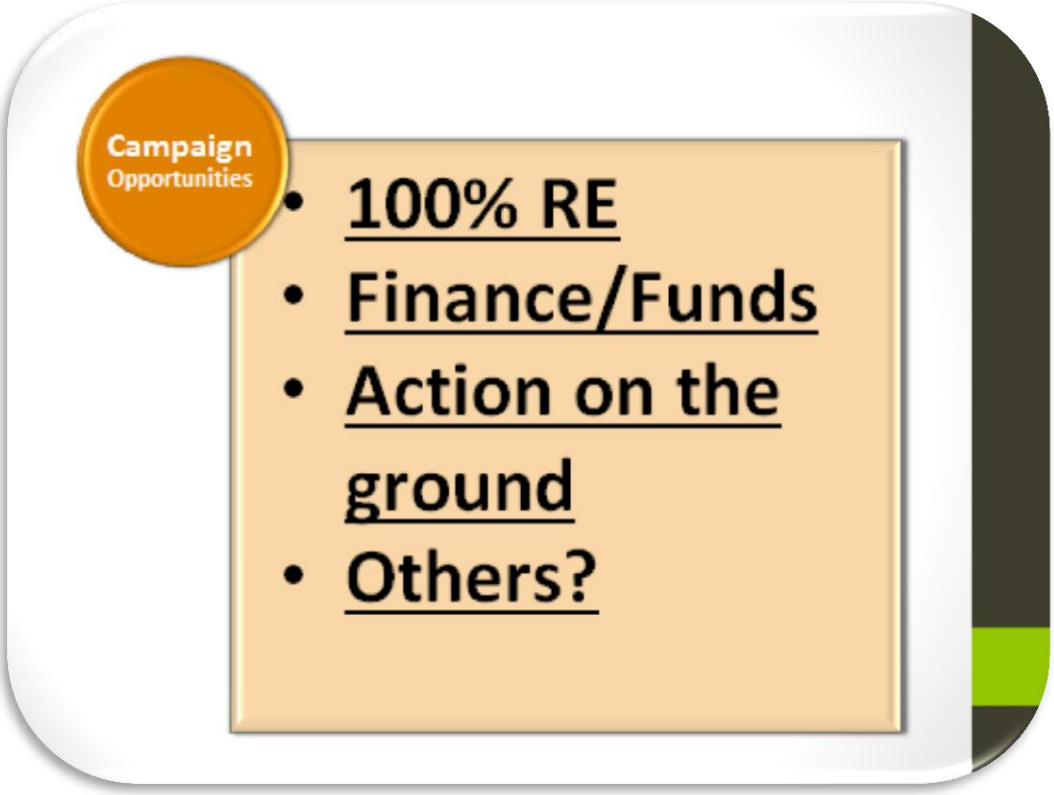

Strategies:
CAPACITY BUILDING
Develop business cases that illustrate a transition to RE that makes financial sense
Prepare a strategy that makes use of quantified co-Benefits to aid in target setting (perhaps carbon pricing)
Crowdsourcing- Greenpeace Greece Strategy/Plan


Strategies:
• NGOs "Walk the Talk" for RE Quality
• Speed-up! How? People Power!
• Make Solar go Viral! Cool! Sexy!
• Micro-Grids on Ground
• Solar Communities/Islands/Cities Cooperate
• Field Visits to RE Projects


Strategies:
INFORMATION
• Library of Resources (business cases, success stories)
RE Capacity Building Academy
• Map Initiatives to Demonstrate Impact
• Share Scenarios/Plans /Economics of 100% RE
• Replicable Business Models
• Increase political pressure and isolate politician's
• Skill Sharing Workshops for RE Campaigning


Strategies:
COMMUNICATION
• You Tube Channel to display Campaign Materials
• Common Communication Platform
• Partner with Local/Regional Language Media
• Online Fundraising for Campaigning/Social Media


Strategies:
CAMPAIGN FRAMEWORK
• Engage in Interpretation of 100% RE Vision to Local Context
• Identify a Champion/Change Maker in your Country
• Making the link from Global to Local (Glocal)
New Strategic Expert RE Group



Working groups

- 100% RE umbrella campaign → Anna
- Pushing for RE in int. processes and fora (SDGs, UNFCCC, IRENA ...) → Allison
- Creating RE pilots to influence governments → Rama
- Shaping existing funds for RE (e.g. BRICS bank ...) + Investment funds→ Yunwen/Stephan
- Creating effective RE support legislation → Ansgar
- Capacity Building --> cross issue TBC

Questions for discussion…

- How could a campaign/campaigns look like?
- What are the opportunities, what are the threats (pros and cons)?