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POSITIONING PAPER: DAY 4 – NOV. 24, 2016

ENERGY & SUSTAINABILITY

INTRODUCTION

To create a framework for Crowdsourcing Week Europe 2016, people from various backgrounds formed a work-group to reflect on the way to accelerate energy transition and the move to a more sustainable society. On the back of global warming, the topic is increasingly high on the agenda of a number of politicians. Besides, and probably more importantly, there seems to be a growing awareness on the long list of negative consequences of the so-called carbon economy; health problems, mobility issues, deforestation, species extinction, thawing of the polar ice caps, population displacements, geopolitical conflicts...

Although there are moves in the right direction, the most significant probably being the signing of the COP21 treaty in Paris in December 2015, the challenge remains huge, with booming demography in developing countries and a dramatic surge in energy consumption, also attributable to new technologies. This paper strives to popularize a complex topic, and highlight the brakes still restraining a Green Revolution.

UNDERSTANDING WHAT IS AT STAKE

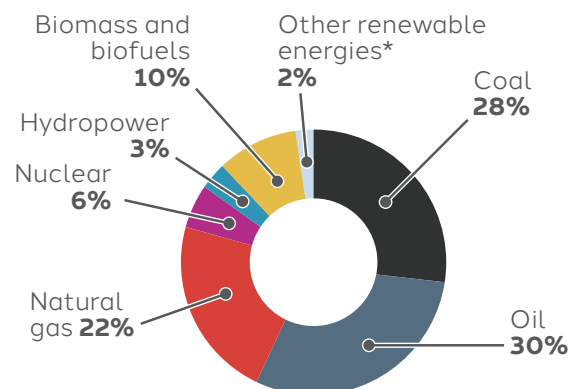
Understandably, one of the main hurdles to tackle on energy and environmental issues is its complexity. There is much confusion, and most people miss the big picture.

1. Energy Mix and Carbon Emissions

First it is important to bear in mind the global energy mix, and the impact of each energy source on carbon emissions. As one can see below, fossil fuels (i.e. coal, oil and natural gas) account for approximately 80% of the world's energy consumption. And as one can see on the second chart, fossil fuels are the energy sources that by far produce the most carbon emissions. It is important to note that electricity is just a fraction of energy consumption (+/- 20%); meaning that even countries that have invested heavily in nuclear reactors are still very dependent on oil; indeed **oil accounts for 98% of our mobility needs**.

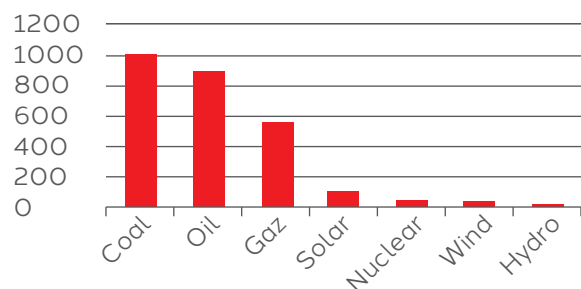
Global Energy Mix in 2020

(source International Energy Agency)



Carbon Emissions (grams per kWh)

(source Intergovernmental Panel on Climate Change)





2. The Carbon Economy

It is a fact that our development model for the last two centuries has been highly dependent on fossil energy - first coal, then oil and gas. Quite logically, priority has been given for a long period of time to economic development, with little concern about environmental consequences.

The oil crisis in the 1970's was an eye opener on Western countries' energy dependency, not to mention Middle East geopolitical tensions more or less directly linked to it.

Even so, little was said at that time about the fact that carbon emissions trapping solar energy in the atmosphere raises temperatures. The problem is aggravated by the fact that carbon dioxide persists for decades, meaning reversing the situation will take a huge amount of time. The direct consequences of this temperature rise are:

- Rainfall dramatically increasing in some areas, polluting drinking water supplies
- Wildfires, droughts and tropical storms, causing devastation and destruction of infrastructure
- Rising sea levels with floods and angerous consequences on shorelines
- Changes in growing conditions of food crops, reducing yields and increasing food prices

For humanity, these consequences can only result in population displacements, starvation, diseases and conflicts.

LONG-TERM VISION VS. SHORT-TERM INTERESTS

The shift to a low-carbon economy requires a long-term vision – a change of paradigm hampered at both individual and organizational levels.

1. At an individual level

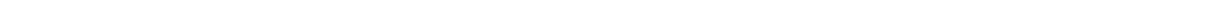
One of the elements that makes the shift to a low-carbon economy extremely challenging is the fact that, for the vast majority of people, the problem is totally invisible:


- It is cumbersome to understand precisely what we pay for, what amount of energy we consume
- The environmental costs related to our energy consumption are not taken into account
- Most people don't suffer (yet) the consequences of our excessive carbon emissions

In fact, as long we don't really feel the pain, environmental issues and its consequences listed above remain a low priority for the vast majority of the population. Awareness is necessary but so far seems much less efficient than financial incentives or coercive measures.

2. At the organizational level

For institutions, corporations, governments etc., tackling environmental issues is made very





complex by the necessity to adopt a long-term perspective, as opposed to pursuing short-term interests. For example, investing in renewable energies means heavy capital expenditures and in many cases giving up cheap fossil resources and scaling down industries that employ thousands of workers, all difficult moves for industrialists and governments.

If we consider that time horizons for governments are generally around 5 years, for industrialists around 2 years, and even shorter for financiers, obviously adopting measures with a vision and a return based on a 30 to 50-year horizon is extremely challenging.

THE WAY FORWARD

1. Solutions Exist


Amongst the numerous **renewable energies**, wind and solar photovoltaics are currently the fastest-growing sources. Between 2008 and 2015, the average cost of land-based wind decreased by 35% and that of solar photovoltaics by 80%. A "next generation" phase of deployment is emerging in resources that are both technologically mature and economically affordable. Some interesting innovations in these fields could accelerate further potential; for example, scientists are currently developing high-altitude wind turbines capable of harnessing stronger and more consistent winds higher in the atmosphere.

Despite these advancements, many experts agree the biggest potential lies in **energy saving**, or energy sobriety. As of today, our economic model and our standards of living tolerate or even encourage (1) people to use cars that weigh +/-1.5T to commute every day, (2) planned obsolescence of electronic devices, (3) purchase food from overseas. Examples of energy saving are countless; appliances on standby consume the equivalent of several European scale nuclear reactors' energy production, and inefficient thermal insulation can mean heating represents over 50% of a household's overall energy consumption.

However, renewables and future savings will not be of any help to remove the carbon accumulated in the atmosphere during the last century. For this, it seems that trees are the best solution to reverse global warming, and once again the potential is considerable.

2. A Global Challenge That Requires Global Solutions

As intergovernmental decisions appear a pre-requisite to any impactful change, to avoid unfair commercial competition that would give an economic advantage to any of the biggest polluters, the **Paris Agreement** (COP21) in 2015 is a milestone. Indeed, world governments finally forged an agreement to limit carbon emissions to keep global warming "well below" a 2°C rise above pre-industrial levels, and possibly below a 1.5°C rise. In order to achieve this we must reach carbon neutrality by the second half of this century.



Governance at supra-national level is increasingly important for global issues. The **European Union**, one of the most advanced supra-national integration projects in the world, and a key player that has been at the forefront of energy transition, should continue to play a leading role in the coming years with the Paris Agreement being a first step to many other efforts to come.

3. Empowerment

Last but not least, **empowerment** is absolutely essential. In the end, to overcome such a gigantic challenge, inducing massive disruption of existing industries, individual behaviours will make the difference. Empowerment primarily means **decentralisation of energy production**. Until now, energy policies have been driven by top-down approaches that (1) have failed to involve end-user citizens, (2) have in most cases been influenced by other objectives and interests.

The benefits of bottom-up approaches are significant: it boosts awareness among populations, it creates grass-roots movements and initiatives, and it ultimately builds-up a demand for greener solutions that make them economically viable. The **wave of innovation** we are undergoing should accelerate further decentralisation, with renewable energy produced by small units and even individual households. In the future, prosumers (producers and consumers) could become the norm, in a **distributed and interconnected system**.

CONCLUSION

In the end, the challenge is **cultural** as much as **technical**. A genuine switch to sustainability for the benefit of our planet and humanity will require the involvement of individuals as much as institutions; a mix of coercive measures to overcome those who are resistant to change and those who defend short-term personal interests, and empowerment to boost the emergence of solutions that will benefit all of us in the long-term.

Find on **Wooclap** the work-group's [concrete proposals](#) to address the challenges explained in this positioning paper. Everyone is invited to contribute with his/her own opinions and ideas.



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Disclaimer: The views and opinions expressed in this positioning paper are those of the individuals working as a group and do not necessarily reflect the official policy or position of any company or institution they represent. This paper is lead by CSW/CSW2 and its partners and is scheduled to be delivered and presented at CSW Europe 2016.
