

# GREEN REVOLUTION AS A DEEP “HEART TRANSPLANT”: SWEDEN CASE

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 Analysis

Is economic crisis the only global problem we face in our lifetime, like the collapse of Lehman Brothers in 2008? Have you ever witnessed anything like the recent tragic flood after record rainfalls in Iran, days after their New Year (Nowruz) that caused devastation of cities in the country? Will this phenomenon become a global problem just like the Lehman Brothers’ collapse? Or why does U.S Representative Ilhan Omar advocates for national emergency on climate change, instead against Trump’s discriminating border wall, despite the U.S President’s denial of climate change?

According to a recent United Nations report, extreme weather events displaced 2 million people in 2018 alone. As a young climate activist, 16 year-old Greta Thunberg said during her speech at the 2019 World Economic Forum that ‘our house is on fire’. The IPCC

(Intergovernmental Panel on Climate Change) states that we are less than 12 years away from not being able to undo our mistakes. During that time, unprecedented changes in all aspects of society need to have taken place, including a reduction of our CO2 emissions by at least 50%.

In the context of climate change, there are many recommendations presented to defeat the devastating effects of climate change as it affects our life as tough as the economical crisis. It affects our homes and our families. Every country and individual accepts that fundamental changes are needed in order to conduct our economic system with both an ecological a social conscience. But, unfortunately only very few states and decision makers have taken logical and concrete steps, when in fact, governments worldwide are responsible to future generations and to the biosphere.



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## A Solution to the Climate Change: Clean Energy

In the geopolitics of the 20th century, energy played an important role and it continues to do so today. But the politics of renewable energy has remained largely confined to national boundaries and has had few international ramifications. Is this set to change? What is and could be the role of implementing renewables in energy diplomacy?

World-renowned economics Professor Jeffrey Sachs wrote in his book titled *The Age of Sustainable Development* that “The entire world economy has grown up as a fossil fuels based economy and yet fossil fuels are at the core of the climate change crisis...we must undertake a kind of ‘heart transplant’ replacing the beating heart of fossil fuel energy with an alternative based on low-carbon energy!” He stressed the importance of replacing fossil fuel energy with clean and pure energy as fossil fuels do substantially more damage than renewable sources by any measure. About 67 percent of the electricity generated in 2014 was from fossil fuels (coal, natural gas and petroleum), according to the U.S. Energy Information Administration. In producing electricity, fossil fuels dumped millions of tons of carbon dioxide, arguably the prime reason for global warming, into the atmosphere.<sup>1</sup>

Renewable energy (‘renewables’) has been listed as the priorities of national energy policies over the last decade. As a concrete step, renewables definitely help reduce the world’s dependence on climate-damaging, CO2-emitting fossil fuels-which currently meet around four-fifths of the world’s energy needs - and can also contribute to security of supply by helping to diversify energy sources.

Therefore, in this article, as a case country, Sweden’s renewable energy efforts will be reviewed in terms of defeating climate change and setting a new global agenda. Does this country aim on establishing climate diplomacy to leave a sustainable life for the next generations?

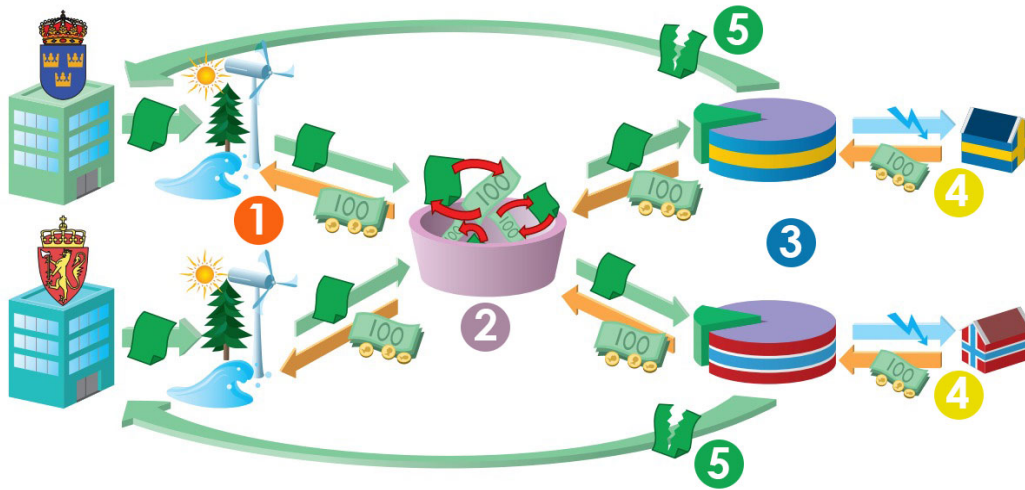
## Sweden: Leading the Renewable Energy Revolution

While it is common knowledge that the Scandinavian countries are worldwide leaders in sustainable development, Sweden is at the top of the list in 2018. In December that year, Swedish utilities and power generators have already installed so many wind turbines that the Nordic nation is on course to reach its 2030 renewable energy target late last year. The Swedish Wind Energy Association’s report *Svensk Vindenergi* writes on the quarterly edition about the statistics and forecasts for the Wind Power Market as it covered data from turbine manufacturers and wind power developers on the Swedish market (estimated coverage is 100 percent respectively 95 percent of the total Swedish market).

### Green Certificate Market

Sweden has to deal with the biggest disadvantage of renewable energy, which is its high cost. Renewable energy is the way more expensive than hydrocarbons and nuclear power. Apart from direct subsidies, the Swedish government has also come up with some smart solutions, which enables it to support renewables without spending the state budget. In the heating sector, Sweden introduced the “carbon tax” in 1991, which is levied on CO2 emissions. And then in 2003 the government also established the “**green certificate market**” to support renewable power struggling producers with low electricity prices. The idea of the “market” is that green power producers would receive a “certificate” for every MWh of renewable electricity that they produce, while electricity suppliers are obliged to buy such certificates.

The main objective of the Swedish electricity certificate system is to increase the production of renewable electricity with 25 TWh by 2020 compared to that in 2002.<sup>2</sup> Between 2002 and 2011, the production of renewable electricity increased by approx. 13 TWh, principally by means of bio power and wind power. In 2012, Norway joined the same system and together



## HOW “THE RENEWABLE ELECTRICITY CERTIFICATE MARKET” WORKS BETWEEN SWEDEN AND NORWAY.

- 1** The energy producers receive one electricity certificate for each megawatt hour (MWh) of renewable energy produced, over a maximum 15 years.
- 2** The electricity certificates are sold in a market where prices are determined by supply and demand. In this way, the producers receive extra income in addition to the energy price.
- 3** Demand for electricity certificates arises in that energy suppliers and certain electricity customers are obligated by law to buy electricity certificates corresponding to a certain proportion (quota) of their calculation-relevant electricity consumption.
- 4** The electricity end user pay for the development of renewable energy production because the cost of the electricity certificates is included in electricity bills.
- 5** Every year, the market participants with quota obligations must cancel electricity certificates in order to fulfil their quota obligation.

**Source:** The Norwegian-Swedish Electricity Certificate Market - Annual Report 2015

the two countries built a joint certificate system. Electricity certificates represent a form of financial support for the production of electricity from renewable energy sources in Norway and Sweden. The electricity certificate system is market-based and is intended to increase energy

production from renewable energy sources in a cost-effective manner.

### *Fighting Against the Climate Change*

Climate change poses an unprecedented threat to our lives and societies. It has immense

consequences for human security across the globe. It is obvious that the way we organize our society and the way we use natural resources are having a global long-term impact on the ecosystem of our planet. The old model of achieving wealth through excessive use of natural resources has proved to be outdated. Some may argue that the call for a paradigm shift of development is too challenging. Sweden, however, sees a land of opportunities in transforming itself and the world towards sustainable development.

The Swedish parliament decided in 2009 that Sweden was to have a fossil independent vehicle fleet by 2030. In 2018, in a press release, Sweden announced to take a positive view of the level of ambition in the strategy, with its aim of net-zero greenhouse gas emissions by 2050.<sup>3</sup>

In the Sweden's Seventh National Communication on Climate Change report, it is stated that emissions of greenhouse gases in Sweden - excluding emissions and removals from land use, land use change and forestry (LULUCF) - fell by 25% over the period 1990–2015 and are expected to continue to decrease. As part of the EU-28, Sweden takes on a quantified, economy-wide emission reduction target jointly with all other Member States both under UNFCCC and the Kyoto Protocol for the period 2013–2020. The Swedish energy system is partly based on domestic sources of renewable energy such as water, wind and bio fuel.<sup>4</sup>

According to the International Energy Agency, the Swedish goals in the energy and climate area by 2020 are:

- 50 % share of renewable energy of the total energy usage.
- 10 % share of renewable energy in the transport sector. The target for the transport sector should be seen in the light of the Government's long-term ambition that Sweden should have a vehicle fleet that

is independent of fossil fuels and with no net emission of greenhouse gases into the atmosphere.

- 20% increase in the efficiency of energy usage. The target is expressed as a cross-sectoral target for reduced energy intensity of 20% between 2008 and 2020.
- 40 % reduction in greenhouse gas emissions. The target applies to the sector outside the European Emissions Trading System (EU ETS) and is equivalent to a reduction in greenhouse gas emissions of 20 million tons compared to the 1990 level. Two-thirds of these reductions will take place in Sweden and one-third in the form of investments in other EU countries or in flexible mechanisms such as the Clean Development Mechanism (CDM).<sup>5</sup>

## Conclusion

In the 21st century, climate change is one of the greatest challenges that we have to face. Especially following the signing the Paris Climate Agreement in 2015 within the United Nations Framework Convention on Climate Change, dealing with greenhouse-gas-emissions mitigation, adaptation, and finance, starting in the year 2020, countries start to change the paradigm of their climate diplomacy and policies for focusing on advancing the implementation of the Paris Agreement.

Humanity needs a green new deal for many reasons, most obviously due to the climate crisis and insecurity on extreme weather conditions. Each new climate report describes the severe consequences of climate change with increasing alarm and the window of opportunity for action is closing. It should be said that replacing fossil fuel-based electrical generation with renewable energy sources is a critical step in slowing and ultimately stopping the global warming. Let us not witness - if not become the victims of - worse rainfalls and floods, to say the least.

## Endnotes

- <sup>1</sup> TRI Global Energy, “Fossil Fuels: The Core of the Climate Change Crisis”  
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<https://www.iea.org/policiesandmeasures/pams/sweden/name-21727-en.php>
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