Czech University of Life Sciences Prague

Faculty of Economics and Management

Department of Economics

Diploma Thesis

(SUMMARY)

Comparison of Solar Energy Situation Between Czech Republic and Germany

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Abstract

Solar energy is very important and relevant topic to current world. The fact that current energy resources are negatively impacting the very environment that humans live in forces us to take action in finding clean energy resource. One of such resources is solar energy. The aim of the diploma thesis is to compare the situation of solar energy in Czech Republic and Germany. The diploma thesis is divided into two parts. The first part is theoretical and describes relevant topics and problems as well as introduces basic terms a problematics. The second part is practical and is based on descriptive and comparative methods. It is focused on comparing various fields between Germany and the Czech Republic like installed solar energy capacity, electricity price, production and consumption of electricity. Based on founded results is formed the conclusion.

Keywords: Czech Republic, Germany, Photovoltaics, Renewable Energy, Solar Energy

1. Objectives and Methodology

1.1. Objectives

The aim of this master thesis is to conduct an in-depth analysis and evaluation on what different types of energy are there currently utilized by mankind with special focus on renewable energy, mainly solar energy and photovoltaics and compare them between the Czech Republic and Germany. Therefore it is vital to analyse and study current energetic and photovoltaic situation to set both countries into the right context.

This means a great focus is paid to electricity production, installed capacity, consumption and others done for all present resources with the focus on photovoltaics for both countries so they can be accurately compared. This includes comparing technologies and even state future plans for both countries and their research as photovoltaics is a still developing field.

1.2. Methodology

This master thesis uses mainly comparative and descriptive methods. Methodology is based on the study of relevant literature, publications of solar energy organizations around the world and various internet resources.

The first part is theoretical. This part is mainly based and focused around studying and exploring existing literature that deals with relevant topics which are necessary to

understand the topic of this thesis. Then it is formed to informative segments that are dedicated to bringing the reader closer to the topic and drawing him in. It clarifies basic terms and introduces the reader relevant topics and certain problematics tied to solar energy.

Second part is analytical. This part uses mainly comparative and descriptive methods. Main part of this chapter is comparing various aspects of solar energy that are current or historic for the Czech Republic and Germany. Evolution of current situation is very important to determine current existing situation and also predict possible future development in these various aspects of solar energy. The focus is mainly on evolution of production, evolution of installed capacity and others. This is done by using graphs that help to compare these data between the Czech Republic and Germany. After the comparison the Author forms a conclusion based on the results and data given.

2. Main Findings and Conclusion

Solar energy industry has been growing worldwide for several years now and the amount still increases every year even though the possibilities of using solar power plants vary a lot. It is very dependable on the geographical location and what kind of weather rules there. That is why countries that are located far to the South or to the North are not suitable for solar energy production compared the countries located near the Equator.

However Germany and the Czech Republic are located right next to each other and even though they are much different in size, they have still very comparable solar conditions. This means that the amount of average solar radiation that falls in both countries is pretty comparable (both countries have average annual sum around 1050 kWh/m^2) with the only exception being very south of Germany where the solar radiation fall is greater (around 1200 kWh/m^2). Nevertheless the overall potential in terms of radiation fall is comparable.

It is also important that both countries are part of the European Union. This means that both countries have similar obligations. The European Union wants every country to reach certain limits like reducing greenhouse gases and certain share of energy from renewable resources. There are targets for 2020, 2030 and 2050. These targets apply for every European country. Even though they may seem difficult to fulfil, they are not, for certain countries that is. Germany has already exceeded some of these targets and even set more ambitious ones for themselves, while the Czech Republic is still far from reaching them.

The reason Germany can easily reach those targets is, because they their history of renewable energies is much longer than in the Czech Republic and not only that. They are willing to generate clean energy if it means higher costs. Germany has set for themselves

to build 2.5 GWh of solar panels every year to increase their renewable energy production, which they are generally holding up to. The amount of solar panels and solar power plants is steadily increasing over many years now which as a result increases the overall capacity and the power generation. They are already so far that in 2016 the renewable energy supplied around 33% of all electricity needed. Which is really great number considering the amount of people living in Germany.

Big event for Germany happened in 2011, when a natural disaster destroyed Fukushima in Japan, which resulted in a public resentment towards nuclear power in Germany. It was so strong the government had to reintroduce nuclear power plants shut down plan. They actually shut down several of their power plants which meant they had to generate that missing power somewhere else and renewable energy is the exact right source. From that point in time Germany invested lot of resource to increase their renewable resources power generation which meant they also had to invest a lot in research since the technology of photovoltaics was lacking a lot at that time.

On the other hand the situation in the Czech Republic was completely different. There were almost no solar panels prior to 2008. However after the Czech government set up a support for new solar power plans basically within two years more than 95% of all Czech solar capacity was built. In such a short time every big or small company build a solar power plant, however the government soon found out that the set up help was too high and not sustainable for a long time and they cancelled it very shortly after. Since then there are almost no new solar panels built or planned even though the Czech Republic is still far from reaching the targets set up by the European Union.

Overall while Germany is trying hard to build new solar power plants and develop new technologies in this field Czech Republic does basically nothing at the moment. It seems government it satisfied with a low solar energy production which is one of the lowest in the EU and does not really care about fulfilling targets given by the European Union. On the other hand Germany is one of the top countries in solar technology research and world solar capacity instalment, which clearly shows their dedication in this matter. Even though it means they will have to improve their transmission and distribution grids, which are already one of the best in the world.

However since photovoltaics is a decently young and not enough developed technology, it means that there are some drawbacks when investing heavily into it. Since Germany has so many solar power plants and renewable energy power plants in general it makes their electricity much more expensive. It actually is one of the most expensive ones in the world which is a result of a really big Renewable Surcharge fee which is around 24% as of now in increasing every year. On the other hand the electricity price in the Czech Republic as well as the Renewables Surcharge is much lower.

However where does this drive come from? What is the core difference? The Author of this thesis thinks the core difference in in people that live in these two

countries. While German people seem to really care about their environment to such an extent that they are capable of doing public demonstration against nuclear power and even paying more for electricity because of more expensive renewable power, the people in the Czech Republic seem to not care at all. It is very simple, because the government in Germany is pushed by the public opinion against the nuclear power so much that they had to fully commit and invest into renewable and solar energy. German people are willing to do small sacrifices to have clean energy, that the German government tries really hard to provide. On the other hand there really is nothing happening in the Czech Republic except maybe plain words from government about reach the European limits, but in reality these cannot be reached if there is no effort to do so at all.

Overall the solar energy situation is much better in Germany than in the Czech Republic from every single aspect like technology, research, production, installed capacity and others. However there is also a big difference in the mind-set of people and government between these two countries. One seems to really care about future of the Earth while the other only about their profits.

It is actually surprising how big the gap between the Germany and the Czech Republic is there. If there is a chance for the Czech Republic to catch up to Germany even closely, it will take many years to do so.

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