

# Public perceptions of renewable energy solutions

Noora Miilumäki

University of Oulu, NorTech Oulu

12.8.2013

## Introduction

This report compiles the perceptions of Finnish people on four different renewable energy solutions - wind energy, solar energy, hydro power and bioenergy - were studied by observing the discussions in social media. The main focus is on bioenergy. Forums from the following web pages were studied:

- ✓ Tiede  
(<http://www.tiede.fi/keskustelut/>)
- ✓ Tekniikan Maaailma  
(<http://tekniikanmaailma.fi/keskustelu/>)
- ✓ Suomi24  
(<http://keskustelu.suomi24.fi/debate/5606>) (Renewable energy -section)
- ✓ Keskisuomalainen  
(<http://www.ksml.fi/yhteiso/keskustelu/posts/list/12681.htm>)
- ✓ Ilmastofoorumi  
(<http://www.ilmastofoorumi.fi/foorumi/>)
- ✓ kalastus.com  
(<http://kalastus.com/keskustelu/kaikkea-kalastuksesta-arkisto-2009/vesivoimasta-luopuminen>)
- ✓ Savon Sanomat  
(<http://www.savonsanomat.fi/lukijoilta/keskustelupalsta/posts/list/8010.htm>)

Also two studies on the perceptions of Finnish people were examined (see References):

- ✓ Suomalaisten Energia-asenteet 2012 (Energiateollisuus ry.)
- ✓ Mitä suomalaiset ajattelevat tuulivoimasta (Mikkonen & Aarni)

The report was written to support the WARES project.

## Perceptions of wind energy

When searching discussions concerning renewable energy, wind energy is the first technology to appear. It is also discussed the most frequently. However this is not a positive thing; the discussion is negative, putting wind turbines in bad light. Wind turbines are criticised because, according to the writers, they are aesthetically unpleasant and because they cause noise and shadow flicker. Also the financial support for wind energy is criticised; some people find that the only reason why wind turbines are still rotating is the financial support and that the financial support does not make wind energy sustainable. Still, it comes to mind if this negativity could be explained by the fact that people who are against the wind turbines are louder than the ones who are in favour of the turbines?

Most of the negative statements seem to be written by people who have first-hand experience of the adverse effects of wind turbines as they live or have lived in the vicinity of wind turbines. At the same time people who diminish the effects seem to have only seen them from afar not having personal experience, forming their opinions only with information from the media or other sources. Some people remind the latter group, who are in many occasions referred to as “green people”, that the adverse effects are known by authorities and should thus be acknowledged by all.

People also find wind turbines to disturb their ability to enjoy nature. One person writes that in nature the things that calm and relax you - the stillness or just the nature's own movement - are lost because of the rotating wind turbines. The writer also states that money should not rob us the most valuable experiences which the calm, natural nature provides us. From this it can be concluded that some people do not find wind turbines as natural, even though wind energy has been marketed as a pure and natural source of energy.

People have also mentioned the electricity contracts in which electricity companies say to provide the customers with electricity produced purely with wind energy. Electricity produced this way is more expensive than other alternatives. One person states with amusement that will the company then cut the electricity from their house if there is no wind? It seems that people have not found this contract as a reliable way to use renewable energy and would like to see more concrete solutions to be sure that the electricity they use is purely produced with renewable energy.

While most of the people seem to be against wind energy, some still remind that the disadvantages such as noise and shadow flicker can be avoided by constructing the wind turbines far from residential areas. Places such as seashores are suggested. Some also suggest vertical rotors instead of the horizontal ones as a quieter alternative. One writer, a quite active proponent of renewable energy, also reminds the others that wind (or solar) energy is not planned to be used as the only source of electricity still for a long time.

What is interesting is that while discussion in renewable energy forums is mainly negative when it comes to wind energy, a study on people's perceptions (Mikkonen & Aarni 2013) suggests that 50 % of Finns think very positively on wind energy as an energy source. Over 50 % would even want to increase the use of wind energy compared to the current situation. The study also indicates that over 50 % of people living in municipalities which do not yet have wind energy projects would think positively about a project. The same results have been obtained when asking about the municipalities where people have their summer cottages; over 50 % would think positively about a wind energy project in the municipality where they have their summer cottage. (Mikkonen & Aarni

2013) Another study, conducted by Energiategollisuus, supports these results; according to the study 87 % of Finns would increase the amount of wind energy. (Energiategollisuus ry 2012)

In conclusion, wind energy does not get support in the Finnish discussion forums. People who live or have lived close to wind turbines describe the adverse impacts to be noise, shadow flicker and the unpleasant view created by the big construction. It is suggested that these adverse impacts could be overcome by building the turbines to uninhabited areas such as seashores. The fact that wind energy is financially supported seems to also be an aspect which is seen in a negative light. However, the discussions and studies presented are in contradiction. Could this be explained by the fact that only a small number of people have experience on wind turbines and the people who have not lived in the vicinity of wind turbines - the majority - support them? Or is the reason simply that the opponents are more eager to get their thoughts through?

## Perceptions of solar energy

The discussion on solar energy is mainly concentrated on sharing information between people about the equipment related to solar panels. People are interested in installing solar panels, mostly to their summer cottages, and want to know how big panels they need and how sufficient they are; could the electricity needed for their cottage be solely produced with solar energy. People do not see selling excess electricity as a viable option and are mainly interested in producing enough energy for their own needs.

One big issue in the discussions about solar energy in Finland concerns the long, dark winters. People are not convinced that solar energy is a good source for renewable energy in the north, because when heat is needed during the winters the sunny periods are short and on the other hand during the sunny summers not as much energy is needed. However, people who have solar panels and have observed them write that even though the months between November and February are too dark to get much power, the power obtained starts to increase after February. Thus only few months of the year are not favourable for producing energy.

Even with the discussions about the harsh winters people seem to be truly enthusiastic about solar energy. One person writes that they would like to see solar panels on the roofs of terraced and detached houses saving energy. They acknowledge that other sources of energy are needed - solar energy cannot be the sole source - and most suggest wood as another source of energy as well as using electricity. One person acknowledges that the repayment period can be long but is more willing to put their money into the panels than to for example oil.

Overall, the discussion about solar energy is positive. People are aware of the difficult conditions Finnish winters cause, but are not taken aback by this fact. They understand that solar energy cannot be the sole source of energy and that the repayment periods can be long, yet their enthusiasm makes them able to overlook these hindrances. A study by Energiateollisuus supports this conclusion; it is presented that 91 % of the respondents would increase the use of solar power in Finland. Of all energy sources, the respondents would increase the use of solar power the most. (Energiateollisuus ry 2012) The results and discussions go to show that solar power is the renewable energy source that Finnish people support the most; people would like to test the technology themselves and learn how solar energy can be efficiently used. Solar power is seen as a viable renewable energy solution which should be further explored in Finland.

## Perceptions of hydro power

In the social media hydro power is seen in quite a negative light. According to people writing in forums, the plants have an adverse impact on the movement and breeding of fish as well as on the natural cycle of water. The discussion is not as frequent compared to for example wind turbines and solar power, which is most likely due to the fact that hydro power plants have been used for such a long time and the other two are developing technologies, but a clear negative attitude can be noticed from the discussions found. Fishermen seem to be the main group to oppose hydro power.

The ones to write negative statements about hydro power have personal experience on the adverse effects of hydro power plants. They are fishermen or other people living near the plants who are exposed to the effects such as changes in water level and ice thickness. The tone of the discussion is angry at some points as the people affected by the plants do not find that they are being heard; they see that everybody else in Finland is thankful for the “clean” energy provided with hydro power as they do not live near the plants and are thus blind to the adverse impacts. They are frustrated that hydro power is presented as a natural and green energy source while the negative aspects are left unmentioned.

The most frequently discussed matter is the impacts hydro power plants can inflict on fish populations; the fish are not able to breed naturally and the changes in the water levels destroy their eggs. They are also worried about waters getting murky as the plants prevent waters from changing naturally. People would like to see improvements in the fish ladders in Finnish rivers; in their opinion the ladders in other countries such as Sweden are more developed than in Finland.

However, there are people who try to remind the others that even though hydro power causes adverse effects, it is a cheap, environmentally friendly and a flexible way to produce energy. They acknowledge that environmental issues need to be addressed but at the same time they ask others to remember that people need to live, the society needs to function and companies need to produce goods. For these actions energy is needed and hydro power is still a good alternative.

In the end, hydro power is seen in quite a neutral light. The ones presenting negative impacts are still quite a small part of the population. Most of the discussions are between fishermen; people who are in contact with the plants and their effects almost daily. According to a study by Energiategollisuus, 71 % of the respondents would still like to increase the use of hydro power in Finland (Energiategollisuus ry 2012). It seems that the same conclusion can be drawn as with wind power; the ones most vocal about hydro power are the ones that have concerns about the adverse effects. They are the ones to discuss about their findings more eagerly than people who support the projects.

## Perceptions of bioenergy

The word 'bioenergy' is a red flag in Finnish social media; the topic provokes discussions for and against the utilisation of different sources of bioenergy. Some sources are mainly seen as positive and some negative while some, such as peat, arouse heated debates both ways. Still, the discussion is quite neutral when compared to for example wind energy, which is the most frequently highlighted topic in Finnish social media. This could be explained by the fact that bioenergy is not as visual. It also seems that Finns are not always aware what can be categorised under bioenergy.

The first glance at the forums shows that some people find the use of bioenergy to be the detriment of nature. Cutting forests for wood and using cultivated land to produce energy crops is not seen as a sustainable solution for replacing fossil fuels. Also the CO<sub>2</sub>-emissions of bioenergy have brought on some discussion about whether bioenergy can bind the same amount of carbon as it releases while it is transformed into energy. However, some forms of bioenergy are welcomed eagerly as people want to participate in the production of cleaner energy in their own homes with their own work.

### Fire wood, chips and pellets

Fire wood, chips and pellets are used in many Finnish homes for heating. They are frequently discussed in many forums; people want to know which one is the best and cheapest energy source for their homes and what kind of technical solutions are required. However, it seems that people do not classify these three under 'bioenergy'. They are merely seen as a means to heat homes as has been the tradition for many years.

When asked about why people on one discussion forum use wood for heating, the three answer options getting most votes were 'I want to affect the heating expenses with my own work' (27.1 %), 'It is a cheap form of heating (24.6 %)' and 'I have an own source of wood' (20.1 %). Only 7 % of the respondents answered 'Because it is ecological and environmentally friendly'. (Puulämmitys.info 2011) This supports the concept that Finnish people use wood for heating because they see it as a cheap and easy solution and because they can also influence the heating costs more directly, not because it is a renewable energy source.

### Peat

Peat is not categorised under renewable energy in Finnish energy politics. This seems to make peat a hot topic in Finland; the main issue under discussion is whether peat should be categorised under 'renewable' or 'non-renewable' and why peat is non-renewable in Finland, but renewable in Sweden. Some think that peat and bogs should be kept as the natural carbon sinks they are while others find the use of peat being acceptable if the use matches the growth. Some are also concerned about peat lands polluting nearby waters.

The ones supporting the use of peat in Finland justify their opinion by stating that in Finland peat grows faster than it is used and thus it can be seen as a carbon sink. The supporters are astounded that in Finland peat is seen as bad as coal or even worse than coal when it comes to emissions. The big question is why Finland has such a different approach than Sweden where peat is categorised under renewable energy and its use is financially supported. One person suggests that peat industry could be given financial support also in Finland in order to be able to use peat from already trenched

areas where carbon will be in any case released. However, the same person states that they do not support the use of bogs which are in natural state, binding carbon. Another person admits that the use of peat may not be the best option in the long run but states that it still is a better option than fossil fuels.

People supporting the use of peat see it as a way to make Finland less dependent on imported energy. Peat is seen as a source of domestic energy and a means to make Finland a big energy producer. One person states that there is no better fuel to produce district heat and electricity in Finland than peat. The same person also writes that the setbacks in the past should not mean that peat cannot be used in an environmentally manner today. People paint a picture of Finland being the world leader in the skills and knowledge of utilising peat. One person indicates that peat could be the next Nokia which will put Finland back on the map.

There is also the group which opposes the use of peat; they justify their opinion by stating that peat bogs are binding more carbon than forests and if peat is dug out the carbon will be released into the atmosphere. They see the use of peat being comparable to the use of coal when it comes to the emissions and see that it renews itself too slowly to be a renewable energy source. They state that even if trees were to be planted to the areas where peat has been dug out, it would not be as good of a carbon sink as peat. Also the impacts on waters caused by the use of peat are seen as an important reason why the use of peat should be decreased. Impacts such as increased levels of humus and heavy metals have been listed by people living near peat bogs that are being utilised by industry. One person seems to sum up the thoughts of all the others opposing the use of peat: "The place of peat is in the bogs, pollution of waters and air by digging up peat and burning it is not sustainable development".

In the end, people cannot seem to come to a conclusion whether peat should be seen as a renewable energy or not. People seem to be eager to get more information on peat; whether it produces more CO<sub>2</sub> than binds it and whether it really is sustainable and a better solution than fossil fuels. One person presents that a better solution to classify energy sources than to say they are 'renewable' or 'non-renewable' would be to look into the regrowth rates of the fuels. They state that every source could be used, including oil and coal, as long as the use is limited so that the fuel has time to regenerate.

## Biogas

The view of biogas in social media is quite positive and supportive; people find it to be a viable option as a renewable energy source. It is even said to be a great possibility "as it is in truth the only bio fuel which creates 0 g/km carbon dioxide emissions". Another person describes biogas to be "one of the best environmental acts". Unfavourable opinions are rare.

Biogas is seen as a great opportunity for Finland; according to people discussing in forums the production of biogas would create new jobs and make Finland more self-sufficient on energy. One person also writes that the technology developed in pursuance of the implementation of bioenergy could be sold to other countries instead of paper machines. People living in the countryside seem to be the group of people most interested in biogas as they could produce it at their own farms. Most of their discussions are focused on explaining techniques they have found to be functional in their farms. One person sees biogas as a solution to keep Finnish countryside thriving. In addition to

biogas being produced in farms, people also discuss the matter of producing biogas from waste water sludge and bio waste. Some people have tried to produce biogas in mini and small-scale reactors in their apartments and like to discuss how other people's experiments have worked out. People seem to be eager to learn about the production of biogas - whether small or big scale - and how it could be utilised.

People do not seem to have many negative opinions about biogas and only a few drawbacks are mentioned. One of these drawbacks is that the production of biogas is decentralised in Finland; small amounts of biogas are being produced here and there and those sources are too small to be used on their own. Other drawbacks are related to the use of biogas as a fuel for vehicles; one person describes that biogas needs to be cleaned and pressurised before it can be used as a fuel whereas if the biogas was to be burned it could be used as it is. They suggest that a better way would be to use diesel in cars and use the biogas in power plants instead of coal. They add that this might not be as 'media sexy' as if the gas was to be used in city busses but that this would assure more effective use of biogas.

When it comes to the use of biogas as a fuel for cars and busses, some do not see it feasible yet but some say to already drive a car fuelled with biogas. One person to use biogas as fuel for their car states that they would use biogas even if it was as expensive as petrol because it is domestic and renewable.

Of all the bioenergy solutions biogas appears to stimulate the most interest and people seem to be able to classify it under bioenergy more easily than for example wood. People see biogas as a viable option for producing energy for everyday life, not just a means to prevent emissions. It is said to be a renewable and domestic source of fuel.

### **Liquid bio fuels**

The negative tone of discussions concerning liquid bio fuels cannot be unnoticed; people are direct when describing their opinions about for example bio ethanol and bio diesel. On one forum bio fuels are even described as "a green bubble and an illusion".

The main concern about using liquid bio fuels is their production. People find that the production of bio fuels from energy crops causes famine in poor countries as the crops take room from edible plants. They mention that there are many things which can affect the creation of starvation and bio fuels are one of them. Even if we are not able to influence the other factors, we can affect the production and use of bio fuels. One person even states that the use of food to produce bio fuel is immoral and that they cannot find a reason why liquid fuels should be used.

Few discussions concern energy crops in particular. Also in these discussions people are worried about the effect the energy crops can have on poorer countries but do not see it as a problem in Finland. One person suggests planting energy crops in fields that are otherwise unprofitable. Reed canary grass (ruokohelpi in Finnish) is mentioned and a few people say they cultivate it in Finland, but people appear to be uncertain of its benefits.

One person states that bio fuels are simply too expensive and would need financial support and are therefore unable to rescue us from pricy petrol. People also criticise companies producing bio fuels for giving a falsified image to customers on how beneficial and environmentally friendly bio fuels

actually are. It appears that Finnish people see liquid bio fuels as nonsense, a business gimmick to fool people who want to act in an environmentally friendly manner. They do not see liquid bio fuels to be a viable option yet.

### **Studies on the perceptions of bioenergy**

In a study conducted yearly by Energiateollisuus, the attitudes of Finns towards energy are examined. In the study made in 2012 74 % of the respondents would like to increase the use of bioenergy, 15 % think it should be kept at the same level and only 5 % would decrease it. (Energiateollisuus ry 2012) The results do not seem surprising; when observing the opinions of Finnish people in social media, the tone used when discussing about bioenergy is in general quite positive. All in all Finnish people seem to want to increase the use of renewable energy and they find bioenergy, at least some of its forms, to be a good option to realise this goal.

In the study peat has been separated from bioenergy; 26 % think the use of peat should be increased, 26 % think it should be kept the same and 37 % think that the use of peat should be decreased. The percentage of the respondents who would like to see the use of peat decreased has been increasing during the years and in 2012 the percentage was the biggest (observation period was between 1986 and 2012). (Energiateollisuus ry 2012) This result is in line with the perceptions observed; Finns have become more aware of the adverse impacts of peat and do not see it as a sustainable solution to produce energy.

### **Conclusions**

Today, locally produced goods are important for Finnish people. This also goes for energy. Finns are interested in using energy which is produced in their yards, farms, fields or forests. They do not avoid work but want to affect the production of energy they use. Still, it seems that people do not know what can be classified as 'bioenergy'.

Wood, chips and pellets appear to be the most used source of bioenergy in Finland; wood is a traditional way of heating Finnish homes and people appreciate that it is a domestic source of energy. Finns are also willing to welcome new bioenergy solutions; biogas seems to be found a viable option for producing renewable energy. Peat and liquid bio fuels on the other hand do not get support; peat is not found sustainable and liquid bio fuels are seen merely as an illusion.

Finnish people are interested in bioenergy solutions which in their opinion have a real chance in being effective. It seems that they would like to learn more about the possibilities of bioenergy but some are taken aback by the heated discussion concerning all renewable energy solutions. It remains to be seen whether bioenergy proves to be a viable alternative embraced by all or a marginal solution for only some to benefit from.

## References

- Energiateollisuus ry. (2012) Suomalaisten Energia-asenteet 2012. Published in November 2012. Available as a PDF-file: [http://energia.fi/sites/default/files/julkaisu\\_-\\_energia\\_asenteet\\_2012.pdf](http://energia.fi/sites/default/files/julkaisu_-_energia_asenteet_2012.pdf)
- Mikkonen A & Aarni M (2013) Mitä suomalaiset ajattelevat tuulivoimasta. Tuulivoimakysely 2013, a research by Energiateollisuus ry, Motiva Oy and Suomen Tuulivoimayhdistys, executed by Aula Research Oy. Available as a PDF-file: [http://www.motiva.fi/files/7321/Mita\\_suomalaiset\\_ajattelevat\\_tuulivoimasta.pdf](http://www.motiva.fi/files/7321/Mita_suomalaiset_ajattelevat_tuulivoimasta.pdf)
- Puulämmitys.info (2011) Kysely: Miksi lämmität puilla? [web document]. Questionnaire started 23.1.2011 [cited 8.8.2013]. Available: [http://www.puulammitys.info/index.php?topic=53.0;prev\\_next=prev#new](http://www.puulammitys.info/index.php?topic=53.0;prev_next=prev#new)