

Barriers in Sweden that prevents the renewable energy to develop in an optimal way

Sub-project in the EU project "Keep-On-Track"

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ELECTRICITY

Summary

For electricity, has many obstacles to particularly expansion of wind power emerged. In many cases, the legislation has not kept pace with developments and is in great need of being updated. Electricity prices have fallen sharply in recent years. Should we reach the target of 30 TWh of wind power by 2020, there must quickly be changes in applicable legislation. It is therefore important that the conditions for wind power in Sweden are investigated as quickly as possible to get a long-term but flexible legislation.

The transmission capacity for electricity to neighboring countries is insufficient, which is one of the main causes of today's low electricity prices. It is therefore important to investigate how such a development can best be done, and ensure that the necessary political decisions for this can be taken.

There is also a problem that those who produce electricity on a small scale, usually only on a limited extent can store the electricity produced on the grid for later consumption. It would be good if small-scale electricity producers could store electricity on the grid by example a net debit system. The proper functioning of such a system is important for the expansion of solar power production. Unfortunately proposed by the Net Debit Inquiry (SOU 2013: 46) was that the net debit system should not be introduced when such a system would come into conflict with the VAT Directive. The Inquiry also did not see that any of the exemptions contained in the VAT Directive can be used in such systems. The Inquiry suggested instead that the micro electricity producers would receive a tax credit which roughly corresponds to the amount the producer would have earned in a net debit system.

1. Inefficient Certificate System

Description of the barrier:

The electricity certificate system in Sweden is not as effective as the feed-in system (minimum price, SEK/kWh) is in e.g. Germany, United Kingdom, Ireland and Finland. The system has led to a rapid expansion for some years, but the risk is now high that the rate of development of renewable energy in Sweden is hampered because of low prices of the electricity certificates with subsequent poor profitability.

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The Swedish electricity certificate system has led to small and medium sized companies that are investing in renewable energy, risk being eliminated.

Small-scale energy technologies are primarily affected, in particularly wind power and solar cells. The problem has increased during the latest three years caused by falling electricity prices.

Competent authority or body:

The Parliament and the Government, the Swedish Energy Agency and large corporations. Their unwillingness to adjust the electricity certificate system worsens the situation for producers of renewable electricity in all areas.

Causes of the barrier:

The Parliament and the Government are responsible of the electricity certificate system. The Swedish Energy Agency has demonstrated a high inertia on the issue. It is likely that large corporations had a significant impact. Sweden's former Government has lacked ambition in terms of renewable energy and sustainable development because they have had too much emphasis on nuclear power.

Consequences of the barrier:

The expansion of renewable energy in Sweden might soon get to an abrupt stop. The electricity certificate system does not work at all for achieving progress, with major implications for small-scale energy technologies.

Small and medium-sized enterprises that are investing in renewable energy risk getting shut down. The expansion of renewable energy goes down dramatically. Only large companies with good access to equity can continue to invest in projects that are loss-making, but with the hope of future profits.

It is difficult to obtain bank loans for investment in facilities that produce renewable energy, as one can not predict the value of the certificates in the future. The certificates adversely affect all types of renewable energy. The electricity certificates forcing banks to expensive loans, with high risk premiums, shorter repayment period and higher down payment, for investors of renewable energy.

Recommendations:

The quota levels, in the electricity certificate system, can be increased almost immediately to increase the demand for certificates. Provide electricity intensive industries a certain quota, which they currently lack, to graze the huge surplus of certificates. This quota obligation for electricity-intensive industries can be increased gradually so that a continuous adaptation can take place. Follow-up continuously how well the electricity certificate system work and make continual, if necessary, adjustments to the regulatory framework. In the longer term (1 year or more), should a Swedish feed-in system (minimum price, SEK/kWh) for new investments in renewable power

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generation, according to Finnish/Irish/UK/German model be introduced. Introduce a guaranteed minimum price at a level that makes investments profitable and secure.

Information source:

Name: Olof Karlsson, Göran Bryntse, Gunnar Grusell

Organisation: SERO

2. Too low price of electricity from renewable energy due to surplus of electricity from e.g. nuclear power plants

Description of the barrier:

Too low price of electricity from renewable sources affecting all levels and process steps, but mainly wind, solar and wave energy. The low price is due to the fact that the Government and the Parliament allows a surplus of electricity produced by primarily the large producers, e.g. by old nuclear plants. Sweden exports electricity due to the surplus. These exports were 7 TWh in 2011, 20 TWh in 2012, 10 TWh in 2013 and 16 TWh in 2014.

Competent authority or body:

The Swedish Government and the Parliament are ultimately responsible along with Vattenfall and other owners of e.g. nuclear power plants. Their decisions and positions affect the situation for renewable energy.

Causes of the barrier:

The former Swedish Government lacked ambition in renewable energy and sustainable development because they had too much emphasis on nuclear power.

Consequences of the barrier:

Too low price of electricity from renewable energy leads to profitability problems for such power generation, and as a result, reduced new investments.

Recommendations:

Introduce a fixed price system for all plants that use renewable energy. Let the market phase out nuclear power, to get rid of excess leading to extremely low electricity prices. Expand electricity transmission capacity to neighbouring countries to enable increased export of surplus power to other markets.

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Information source:

Name: Carl Olov Persson, Peter Danielsson, Göran Bryntse, Gunnar Grusell
Organisation: SERO

3. Military resistance to wind turbines

Description of the barrier:

The Swedish Armed Forces are questioning the wind turbines in southern Sweden (50% of Sweden's land area is affected) and believes that they among other things can interfere with important radio communications during major accidents (e.g., a serious nuclear accident). The details of this barrier are secret of defence technical reasons.

Competent authority or body:

The Government and the Swedish Armed Forces.

Causes of the barrier:

The Swedish Armed Forces believes that wind turbines in southern Sweden among other things may interfere with essential radio communications during major accidents (e.g., a serious nuclear accident).

Consequences of the barrier:

The expansion of wind turbines in southern Sweden is severely hampered. The Swedish Armed Forces' restrictions on wind turbines are a serious threat to achieving the target of 30 TWh of wind power in 2020.

Recommendations:

The Government should quickly adapt the Swedish regulations so that they conform to the standards of other EU countries. Investigate what the Swedish Armed Forces actually need for restrictions on the radio in major accidents, and find out what could be done to solve the problem, e.g. by giving the Swedish Armed Forces the right to, at a serious accident, shutting down the wind turbines they believe could lead to problems. E.g. Denmark has clearly defined the areas where it is OK to build wind power, and the areas where it is not OK.

Information source:

Name: Göran Bryntse, Gunnar Grusell
Organisation: SERO

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4. The Government's unwillingness to aim high

Description of the barrier:

Sweden already, 2012, reached 50% of RES as they have set as a target for 2020. To get started with reasonable discussions of policy instruments for RES, as well as increased investment and technology development, the Swedish Government has to raise the targets to a sensible level.

Competent authority or body:

The Government and the Parliament. Their low ambition degrades the position of all renewable energy in Sweden.

Causes of the barrier:

You cannot get any reasonable explanation to why the Swedish former Government has set the relatively low target for 2020.

Consequences of the barrier:

In Sweden we have a very good capacity to achieve over 70% renewable energy by 2020. If the Government is satisfied (for the next 6 years until 2020) with not making any further efforts, all development and new installation of RES will be reduced. It also means that the Government do not need to make efforts on the issues that are barriers to RES today.

Recommendations:

The Government should urgently raise the target for renewable energy so that it aims to a level that corresponds to what Sweden actually is able to deliver, i.e. 70% or higher in 2020. By 2030, 100% or even higher, renewable energy can be exported, technology expertise can be built up and be exported. Renewable energy comes to more than the environment, in the long term the Swedish high-tech industry must be preserved for future Swedish prosperity. Renewable energy and environmental technologies is an opportunity that must not be Swedish Industry and Sweden by. This is a chance we should not miss. It is important to have challenging targets that are constantly raised in line with the developments taking place. It is important that the politicians here have good foresight. Challenging targets spurs. This is something that must be continually investigated and updated.

Information source:

Name: *Mariell Mattison*

Organisation: *SERO*

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5. Municipal veto against the establishment of larger wind projects

Description of the barrier:

The one who will build wind power must have an Environmental Impact Assessment (EIA), and on this basis, confer with the municipality and other parties (community associations and groups, often resistance groups). The municipality provides building permits for smaller wind power projects. For larger projects the county administrative board gives permit under the Swedish Environmental Code. The municipality can basically stop the project without justification. It is a problem that municipalities often waiting unnecessarily long to give notice. If the municipality late does not permit the project, this causes large unnecessary costs to the corporate promoter.

Competent authority or body:

The Government, the Parliament, county administrative boards and municipalities.

Causes of the barrier:

Municipalities take unnecessarily long time to respond to requests for the establishment of wind power.

Consequences of the barrier:

Wind power projects are delayed unnecessarily. This often leads to projects must be stopped. Many larger wind power projects suffer from very late notification or rejecting without justification.

Recommendations:

The Government and the Parliament decides that the county administrative board may add a penalty of the municipality if the response has not been received within 4 months from the time when the municipality and the county administrative board have received all the documents in the case.

Information source:

Name: *Olof Karlsson, Gunnar Grusell*

Organisation: *SERO*

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6. Withdrawal of permission for establishment of wind power and the withdrawal of building permission for the erection of wind turbines

Description of the barrier:

Permission for establishment of wind turbines and building permits for the construction of wind turbines appealed after a long time (in some cases years) leading to, at amended decision, that in operation wind turbines and wind farms need to be dismantled. Because of this, wind power planners are discouraged from planning new wind power. The Swedish Armed Forces has the right to demand by the county administrative boards and municipalities that already given permission and a building permit is withdrawn afterwards with the justification that the Swedish Armed Forces is not informed.

Competent authority or body:

The Government, the Parliament, the Swedish Armed Forces, county administrative boards and municipalities.

Causes of the barrier:

The county administrative boards and municipalities may withdraw already granted permissions for the establishment of wind power and building permits for the construction of wind turbines if the ruling has formal deficiencies. The Swedish Armed Forces may require the county administrative boards and municipalities to withdraw already given permissions for the establishment of wind power and building permits for the construction of wind turbines afterwards with the justification that the Swedish Armed Forces is not informed.

Consequences of the barrier:

Started or completed construction of wind power must be dismantled because of withdrawn permission for the establishment or building permits. This leads to very high costs for the planner/owners, as well as discourage planners from starting up new wind power projects.

Recommendations:

The Government and the Parliament must legislate so that the owners/planners of wind power will be entitled to fair compensation for a started or completed construction of wind power if it has to be dismantled because of withdrawn permissions for the establishment or building permits.

Information source:

Name: Olof Karlsson, Gunnar Grusell

Organisation: SERO

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7. Poor support system and lack of regulatory framework for establishment

Description of the barrier:

Sweden lacks clear support systems and ambitious targets for establishment of renewable energy. This leads to delay of new establishment of renewable energy. Solar, wind and biogas are most affected. The barrier has become increasingly relevant in recent years.

Competent authority or body:

The Government, the Parliament, the Swedish Energy Agency, as well as municipalities and county councils.

Consequences of the barrier:

It causes a delayed and uneven establishment of new RES facilities.

Recommendations:

The Government should establish clear and ambitious objectives and interim objectives, and further more adapt legislative and regulatory framework to achieve the objectives.

Information source:

Name: Göran Bryntse, Peter Danielsson

Organisation: SERO

Name: Lars Andrén

Organisation: Solar Energy Association of Sweden (Svensk Solenergi)

8. Increased taxation of small-scale electricity production

Description of the barrier:

The Government has proposed increased taxation for small scale electricity generation. This mainly affects small producers of wind power, hydro power and solar power. The tax exemption that now is applied for these electricity producers is proposed to be significantly impaired. The following are suggested:

a) for wind power: The ability to be freed from electricity tax if you use the entire production yourself ceases for new power plants built after 1 July 2016. Power plants of up to 80 kW can get relief from

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the electricity tax. For power plants taken into operation before 1 July 2016 continues the current rules for the exemption to apply.

b) for hydro power: The limit of 100 kW is reduced to 32 kW for the tax exemption for self-produced electricity. No electricity will then be allowed to be sold or supplied to the grid. If you want to sell excess electricity, you will be liable of taxation on the entire production, including the use of yourself. State tax revenues are expected to increase by 47 million SEK by the second half of 2016 and to be 94 million SEK from 2017 due to these changes in electricity tax exemption. Owners of small hydropower plants can be hit particularly hard.

c) for solar power: So far there has been no power limit for electricity tax exemption for solar power. Now proposes a power limit of 144 kW. The requirement that no electricity is allowed to be transferred to the grid to get electricity tax exemption stops/prevents share owned solar power.

Competent authority or body:

The Government and the Parliament.

Causes of the barrier:

The Government has proposed increased taxation for small scale electricity generation.

Consequences of the barrier:

Reduced profitability for small producers of wind power, hydro power and solar power.

Recommendations:

a) The power limit for possible tax exemptions for wind power is increased from the proposed 80 kW to 250 kW.

b) Any self-produced and self-used electricity is electricity tax exempted up to 100 kW.

c) The power limit for electricity tax exemption, for solar power, will be raised to 450 kW and the prohibition of the transit of electricity over the grid at electricity tax exemption is removed. This should also be applied to wind power. A shareholder could then take home their own electricity tax exempted electricity.

Information source:

Name: Olof Karlsson

Organisation: SERO

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9. Lack of political plan for solar power in Sweden

Description of the barrier:

Really small scale production of electricity, e.g. solar power PV, is not enjoying the same support from the Swedish authorities as much as the larger scale electricity producers. As an example, there is no support from the authorities in Sweden, covering issues such as economic investment, training and research grants. This energy source has great potential and needs a sound support system to be able to be developed.

Competent authority or body:

The Swedish Government and the Parliament.

Consequences of the barrier:

It causes a delayed establishment of new PV solar power.

Recommendations:

Introduce support measures for solar electricity in Sweden, covering issues such as economic investment, training and research grants. This is to as quickly as possible to develop this energy source with great potential and need of a good support system. Introduce net debit, which is based on those who produce and sell their own electricity will settle that amount of electricity that they buy at a different time, without paying energy tax and VAT. Net debit thus becomes a system that makes it more profitable to produce own renewable electricity.

Information source:

Name: Peter Danielsson

Organisation: SERO

Name: Lars Andrén

Organisation: Solar Energy Association of Sweden (*Svensk solenergi*)

10. Unreasonable interpretation of tax for wind cooperatives

Description of the barrier:

Uncertainty about withdrawal tax has slowed the development and installation of wind turbines with cooperative ownership. Therefore is wind turbines primarily owned and operated by large companies. This also leads to a decreasing acceptance of wind turbines generally among "ordinary"

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people. Reduced acceptance may also affect smaller wind farms. Withdrawals tax is unique to Sweden.

Competent authority or body:

The Parliament, the Government and Skatteverket (The Swedish Tax Agency).

Causes of the barrier:

Skatteverket has an unreasonable interpretation of the tax laws for wind cooperatives. The Parliament and the Government have done nothing to solve the problem.

Consequences of the barrier:

The expansion of wind power gets more difficult and especially wind cooperatives are hampered. Acceptance among "ordinary" people is not being promoted, when wind turbines are owned and operated largely by big companies.

Recommendations:

Legislation regarding withdrawal tax on wind turbines with cooperative ownership should be urgently reworked, and this tax should then preferably be abolished.

Information source:

Name: Göran Bryntse, Gunnar Grusell

Organisation: SERO

Name: Anonymous Swedish wind power consultant

11. Not sufficient grid infrastructure in Sweden

Description of the barrier:

The Swedish national grid has insufficient capacity for a rapid expansion of wind power. In many places in the Swedish countryside is the grid capacity too poor to today's large wind turbines should be able to be connected to the grid without first strengthening it. This delay or prevent the development of many wind energy projects. In addition there are costs to strengthen the grid before expansion can take place, which make the wind projects more expensive. It can also lead to that wind farms are forced to pull down the effect and release past wind at good wind conditions.

Competent authority or body:

The Government, the Parliament and grid companies.

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Causes of the barrier:

The Swedish electricity network has insufficient capacity.

Consequences of the barrier:

The expansion of wind power is hampered and delayed in many places.

Recommendations:

The Government and the Parliament should establish objectives for a rapid expansion of the electricity grid in areas with good wind resources. Introduce legislation that obliges grid operators to expand electricity grids in these areas. Do analyses of what can be done to make electricity grids smarter and where/how electricity can be stored. Evaluate how the best way to build out the electricity transmission and distribution networks in order to take full advantage of existing and future wind power, but also solar, wave power etc. Moreover, in such an investigation include how electricity grids can be made smarter by steering the use of electricity to times when large amount of electricity is produced, and where/how electricity can be stored e.g. in central batteries and/or in electric cars. Introduce investment aid, development aid and research support to the development of the electricity networks in terms of capacity and smartness. Continuously adapt legislation if necessary.

Information source:

Name: Anton Steen

Organisation: Swedish Wind Energy Association (Svensk Vindenergi)

12. Insufficient transmission capacity to neighbouring countries

Description of the barrier:

The transmission capacity to neighbouring countries, such as Poland, Germany and the Baltic countries, is insufficient when there is surplus electricity. When the supply of hydropower due to abundant rainfall is good and while the weather is windy, Sweden needs the capacity to export large amounts of electricity to neighbouring countries. This problem also becomes greater over time as wind energy is being built, but also to other renewable electricity such as solar and bioenergy. Increased transmission capacity means that electricity prices will increase due to the fact that it will be easier to deliver electricity to other markets with higher electricity prices. This allows increasing profitability for the Swedish electric power, which enables additional investment in renewable electricity. It gives also greater opportunities to fully utilize wind power and hydroelectric power when it is available.

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Competent authority or body:

The European Parliament, the Government, the Parliament and large grid companies.

Causes of the barrier:

The transmission capacity to neighbouring countries is insufficient.

Consequences of the barrier:

The expansion of mainly wind power but also other renewable electricity production is hampered when the profitability is not sufficient.

Recommendations:

The European Parliament and governments in the EU area should introduce legislation that forces network operators to expand transmission capacity between the countries of Europe and in particular between the Nordic countries and Central Europe. Set targets how quickly this will go. Investigate how the transmission capacity between these countries can be built out in the best way. How much capacity needs to be, which countries are most relevant and what technology should best be used for this. If necessary, introduce support and facilitation legislation.

Information source:

Name: Anton Steen

Organisation: Swedish Wind Energy Association (Svensk Vindenergi)

13. Environmental and habitat issues

Description of the barrier:

These issues are connected to the protection of bats and birds of prey e.g. eagles. These birds and bats are more and more common in Sweden and rules protecting their habitat are quite strict. It is very difficult to localise a wind project in an area where birds of prey or bats have their habitat.

Competent authority or body:

The Parliament, the Government and county administrative boards.

Causes of the barrier:

Bird and bat habitats in areas with good wind conditions.

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Consequences of the barrier:

The expansion of wind power gets more difficult because bird and bat habitats have to be included in the planning.

Recommendations:

The Government should give the county administrative boards the task to identify where wind power sensitive bird species, such as birds of prey, nest and where bats have their habitat. Then make this information easily accessible to those who plan wind power. Are there areas that have a high value beauty, they should also be protected and clearly marked on the maps. For hydropower, it is important that the streams where valuable fish migrates get mapped and that this is clearly presented and easily accessible. It is important, that in the best possible way, to prevent scandals such as many of the wind turbines slain birds, bats or similar, and that people see that hydropower disrupts an existing fish migration. Knowledge of this is not that difficult to obtain if the will is there. It is very important that renewable energy has a good reputation, and that people know they can trust that this is built out on ethically good reasons.

Information source:

Name: Anton Steen

Organisation: Swedish Wind Energy Association (Svensk Vindenergi)

14. Complicated administrative procedures

Description of the barrier:

Hydro power is threatened by the way the authorities handle the interpretation and implementation of the Water Framework Directive, RFD. This threat has been around for the past five years, affecting small hydropower.

Competent authority or body:

The Government, the Swedish Agency for Marine and Water Management, Kammarkollegiet and county administrative boards.

Causes of the barrier:

The Government is ultimately responsible for the above mentioned authorities, interpretation and management of the Water Framework Directive (ramdirektivet för vatten, RFD), which affects producers of small-scale hydropower.

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Consequences of the barrier:

By authorities forcing small-scale hydro power operators in lengthy and costly litigation preventing both increases in production and measures to improve conditions for flora and fauna in the water.

Recommendations:

Rebooting/restarting for the interpretation and implementation of the Water Framework Directive, an established governance plan, where measures are implemented in the proper order of politicians and authorities at the right levels, development of national strategy and the coordination of environmental objectives, should give a more correct and economically responsible management and a functional licensing process for water operations. This also gives opportunities to exploit the potential to streamline the existing small-scale hydro power plants and restart the closed small-scale hydropower plants, which should give a new production of about 7 TWh/year.

Information source:

Name: Gunvor Axelsson

Organisation: Swedish Hydropower Association (Svensk Vattenkraftförening)

15. Local opposition to establishment of wind power plants

Description of the barrier:

A barrier of growing importance is the local opposition to wind power plants. Public opposition is not strong. As regards the question of the Swedish people's favourite energy sources wind power is located in second place (right after solar). Nevertheless the Swedish regulations allow even a very weak and small group of opponents against wind power plants to stop or cause a delay in the establishment of wind power projects. Opposition can demand to stop the establishment of wind power projects even if the corporate promoter already has gathered all necessary permissions.

Competent authority or body:

The Government, the Parliament, County administrative boards, Authorities, and large and small wind power companies.

Causes of the barrier:

The locals are afraid of wind power to become noisy, reduce the value of their houses or estates, spoil the view, interfere with bird life, etc.

Consequences of the barrier:

The establishment of certain wind projects to be delayed or stopped.

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Recommendations:

Distribute information to the public about wind energy. Establish clear rules and specifications of requirements for the establishment of wind power. When planning new wind power require the planner to this at an early stage goes through all obstacles to the establishment and reports these. Require collaboration between wind power planners, local authorities and environmental organizations at the planning. All information must, from the beginning, be readily available to all parties. Inform the local population at an early stage. Let the locals get the opportunity to go in with part ownership of new wind power projects.

Information source:

Name: Anton Steen

Organisation: Swedish Wind Energy Association (Svensk Vindenergi)

Name: Erik Dahlquist

Organisation: Mälardalen University Sweden (Mälardalens högskola)

16. Incentives to save heat and electricity throughout building and industrial systems is lacking

Description of the barrier:

One could save a lot of electricity and heat energy by getting whole systems in buildings and industries to function more optimally. E.g. need ventilation system not go fully in an unpeopled room, also needs such a local not as much heat or cold when no one resides there. The heat does not need to chase the ventilation system, etc. The same applies to many production processes in the industry. Much energy could be saved if such systems would be optimized for such a low heat and power consumption as possible. Moreover, among other things, lighting can be controlled up so as unpeopled rooms has extinguished lights, incentives must be to ensure that for new installations "the most efficient" equipments are selected, control equipment must be user friendly so people can easily use it as intended, and energy consumption in the form of electricity and heat must be made visible for tenants in an pedagogical way. All this together makes the need for economic incentives in order to get to the optimization of energy-using systems in buildings and industries, both in Sweden and in the EU.

Competent authority or body:

The European Commission, the European Parliament, the Swedish Government and the Swedish Parliament.

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Causes of the barrier:

There are no Incentives to save heat and electricity throughout building and industrial systems.

Consequences of the barrier:

Building and industrial systems consume more electricity and heat than necessary.

Recommendations:

Some form of grants, such as energy- or eco-rot (for repair, maintenance, refurbishment and extension) should be introduced for the optimization of energy-using systems, in buildings and in industries, that depend on the result achieved. That is to say, a part of the grant is paid out first when the allowance recipient have been able to show how much energy he/she saved by the measures taken.

Information source:

Name: Charlotte Kullander

Organisation: SERO

Name: Anders Forsbom

Organisation: SERO/SWECO Environment AB

17. Lack of information to inhabitants

Description of the barrier:

The knowledge of renewable energy among inhabitants is not sufficiently widespread today. This means that demand for renewable energy is held back, which in turn holds back the development of RES. The barrier has always existed and affects all types of RES in all sectors.

Competent authority or body:

The Government, Agencies and big corporations.

Causes of the barrier:

Decision makers have not yet found the right way to distribute information, when it comes to reaching out to the general crowd with correct information.

Consequences of the barrier:

For ordinary people, it is not obvious to invest in renewable energy, because they have not yet understood the importance of sustainable development.

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Recommendations:

Sweden has direct mailing to almost all households with different types of community information. Use that channel to spread useful information that is easy to understand. Spread even more information to school students so that renewable alternatives are a matter of course when they reach adulthood.

Use social media to get information out to people and have an ongoing dialogue with them.

Keep inspiring and fun debates on television and in newspapers, with talented speaker who reaches out to listeners. Do not use politicians who refuse to answer a direct question.

Launch a national website with information that is written and then run by those who are professional writers - not bureaucrats, and make sure to launch it properly!

You cannot make the right decision if you do not get proper information – if you get proper information, you cannot avoid making the right decision!

Information source:

Name: Mariell Mattison

Organisation: SERO

18. Unnecessary costs for small-scale electricity producers

Description of the barrier:

Small-scale electricity producers can now set off their production to consumption, without unnecessary costs - but only if the electricity is used directly. If you want to use electricity equivalent to production at a later date, you must pay value added tax, energy tax and certificate fee.

If the customer, the small-scale producer of electricity, produces more electricity in a year, than is consumed, they should also pay an additional measurement cost.

Suggested tax credit of 60 öre/kWh lies to the Parliament, investigation is in 2013 (SOU 2013:46), and a proposal submitted by the Government to the Parliament in 2014. This is a so good suggestion that one can get when net debit is not allowed due to legislation on value added tax (VAT) in the EU. However, the Government proposal is an improvement but does not solve the problem. The suggested tax reduction system is more complicated and more difficult to understand for the electricity producer than the recommendation below.

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Competent authority or body:

The Government and the Parliament.

Consequences of the barrier:

Small-scale electricity producers will be hampered.

Recommendations:

Small-scale electricity producers should be able to "save" their electricity into the grid for a month, readily a quarter. During this month, electricity - equal to what has been produced, can be used for personal consumption without extra charges.

When the self-produced electricity is out, customers can buy electricity from the electricity trading company, with the usual taxes and fees. In this way, the customer can influence their electricity costs through investment, which favours the growth on many levels. The model should be optional for the small-scale RES electricity producer, but an obligation for the electricity supplier to offer. Current legislation is being revised, so that the barriers to the above net debit system for electricity, is eliminated.

Information source:

Name: Johan Ehrenberg

Organisation: Egen El

Name: Lars Andrén

Organisation: Solar Energy Association of Sweden (Svensk solenergi)

19. Small wind turbines do not meet the legal requirements

Description of the barrier:

Some small wind turbines are sold even though they do not meet legal requirements. This provides a competitive situation, which is unhealthy. It provides an unfair competitive situation affecting small-scale wind power and could give a negative impact on the entire wind power industry.

Competent authority or body:

The Swedish Work Environment Authority and the National Electrical Safety Board. It seems that they do not intervene until after an incident has occurred.

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Causes of the barrier:

The Swedish Work Environment Authority and the National Electrical Safety Board are not doing much to stop some small wind turbines from sales, even though they do not meet regulatory requirements.

Consequences of the barrier:

Sales of wind turbines that do not meet regulatory requirements, creates an unfair competitive situation for the companies that are more reputable and fulfil the laws and requirements in Sweden. It also provides a risk of breakdowns, which in turn could have negative consequences for the entire wind power industry.

Recommendations:

The Swedish Work Environment Authority and the National Electrical Safety Board should more fully stop the most unsafe products from being sold on the market. The regional aid that is available for investment in small wind turbines should also be linked to quality, preferably by requiring consumer labelling in the first step and also third-party certification in a second step.

Information source:

Name: Anonymous Swedish wind power consultant

20. Questionable companies and "wild inventors"

Description of the barrier:

Sweden, early in the modern wind power history, invested heavily in technological development of wind power. Unfortunately, an attempt to create a market for the products failed, which led to several companies in the wind energy industry, could not survive in Sweden. The knowledge thus has not been managed and in some cases, non-serious enterprisers and wild inventors have embarked on the production of mainly smaller wind turbines.

Competent authority or body:

The Government and the Parliament. Questionable companies and wild inventors have a responsibility, which cannot only be blamed on the authorities.

Consequences of the barrier:

The development of wind power in Sweden is hampered in several ways, and this leaves room for non-serious companies and wild inventors, which introduce malfunctioning wind turbines. Resources are spilled on wrong things that lead to great disappointment.

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Recommendations:

The authorities should do more thorough quality checks before project support is granted. The Government and the Parliament should adopt tougher rules regarding quality assessment of new projects.

Information source:

Name: Anonymous Swedish wind power consultant

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HEATING

Summary

The energy requirements for new buildings are now too low because the legislation has not complied with the technical development that has taken place. It is therefore important that current legislation is updated so that we get an energy efficient and long-term cost-effective building stock. Moreover, there is no incentive to save heat and electricity throughout the building and industrial systems.

Therefore, some form of grants, such as energy- or eco-rot (for repair, maintenance, refurbishment and extension) should be introduced for the optimization of energy-using systems, in buildings and in industries, that depends on the result achieved.

It is a problem that so many small houses today have direct electricity for heating. Since it is very costly to replace these heating systems towards more flexible waterborne systems, and therefore there is a need for some form of financial support for such measures. This requires political decisions that make such development possible.

The low price of electricity and electricity certificates can sometimes be a barrier to the expansion of combined heat and power from biomass producing district heating. There is a potential to increase electricity production in bio-based district heating production from the current 10 TWh to 30 TWh.

There is a strange legislation which in some cases forcing property owners, who do not want to do this, to connect to district heating networks. This legislation is a barrier to the introduction of any other renewable energy.

1. The energy requirements for new buildings are too low

Description of the barrier:

In Boverket's (The Swedish National Board of Housing, Building and Planning) Building Regulations (BBR) are the energy requirements too low which leads to that the energy use of newly built houses will be unnecessarily high. The knowledge available to build energy efficient is not fully exploited. The construction requirements for "near zero houses" are also too low which leads to the construction companies are reluctant to invest in skills development in energy-efficient construction and new building systems for low energy houses. Energy use of a building is very important for its lifetime economy (life cycle costs), then the amortisation period for a building is very long, often

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more than 50 years. It is worth noting that energy use to construct a building gets an increasing impact on the building's lifecycle costs when the building's energy use decrease. It is therefore important to take into account system and materials choice when buildings are constructed.

Competent authority or body:

The Government and the Parliament.

Causes of the barrier:

The energy requirements for new buildings are too low. Sweden's former Government did not think there was enough evidence to indicate how energy requirements will be tightened.

Consequences of the barrier:

The newly built will get unnecessarily high energy use with consequent worsening economy. Construction companies are reluctant to invest in knowledge and new technology. The construction industry will be unsure of Sweden's level of ambition. The targets for improving energy efficiency for buildings are at risk, and may not be reached unless the new construction requirements and requirements for nearly zero energy buildings are tightened.

Recommendations:

The Government and the Parliament must tighten the energy requirements of the building regulations and clearly show what requirements will be applied in the long term. It is important that these reflect the technological development taking place and ensure that the newly built is long-term energy efficient and cost effective. It is important to obtain uniform and stricter building regulations on energy for the whole country to avoid confusion. The energy requirements of the construction regulations should be revised, both in terms of what should be included and requirement levels. It is important that the Government and the Parliament set clear energy requirements for near-zero houses to drive development towards more energy efficient buildings.

Information source:

Name: Johan Mossling

Organisation: VVS Företagen (The Swedish Association of Plumbing and HVAC Contractors)

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2. Incentives to save heat and electricity throughout building and industrial systems is lacking

Description of the barrier:

One could save a lot of electricity and heat energy by getting whole systems in buildings and industries to function more optimally. E.g. need ventilation system not go fully in an unpeopled room, also needs such a local not as much heat or cold when no one resides there. The heat does not need to chase the ventilation system, etc. The same applies to many production processes in the industry. Much energy could be saved if such systems would be optimized for such a low heat and power consumption as possible. Moreover, among other things, lighting can be controlled up so as unpeopled rooms has extinguished lights, incentives must be to ensure that for new installations "the most efficient" equipments are selected, control equipment must be user friendly so people can easily use it as intended, and energy consumption in the form of electricity and heat must be made visible for tenants in an pedagogical way. All this together makes the need for economic incentives in order to get to the optimization of energy-using systems in buildings and industries, both in Sweden and in the EU.

Competent authority or body:

The European Commission, the European Parliament, the Swedish Government and the Swedish Parliament.

Causes of the barrier:

There are no Incentives to save heat and electricity throughout building and industrial systems.

Consequences of the barrier:

Building and industrial systems consume more electricity and heat than necessary.

Recommendations:

Some form of grants, such as energy- or eco-rot (for repair, maintenance, refurbishment and extension) should be introduced for the optimization of energy-using systems, in buildings and in industries, that depend on the result achieved. That is to say, a part of the grant is paid out first when the allowance recipient have been able to show how much energy he/she saved by the measures taken. Inducements in the form of e.g. white certificates may be needed. Energy performance certificates for energy-efficient buildings that provide tax benefits are another possibility.

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Information source:

Name: Charlotte Kullander

Organisation: SERO

Name: Anders Forsbom

Organisation: SERO/SWECO Environment AB

3. Large proportion of small houses with direct electric heating

Description of the barrier:

Single-family homes in Sweden are to a large proportion provided with direct electric heating. Houses with this type of direct electric heating was built mainly during the 1980s and 1990s during or shortly after the time when nuclear energy, in Sweden, was expanded. Houses, which were built before 1975, used to be heated with oil or firewood and then have waterborne heating which is easier to change to heat with different origin. Electrically heated houses are expensive and complicated to rebuild on to another type of heating, then this requires that buildings be equipped with a brand new heating system. In addition, these houses are often not prepared for the piping that this requires.

Competent authority or body:

The Government and the Parliament.

Causes of the barrier:

Sweden has a large proportion of houses with direct electric heating.

Consequences of the barrier:

It is hard to replace the heating in these houses with another heat from renewable sources when a change requires a large investment. It often becomes too expensive. The expansion of renewable heat is prevented in this way.

Recommendations:

Investment grants should be provided for conversion of existing direct electrically heated houses for heating with renewable energy.

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Information source:

Source: Energimyndigheten, *Energistatistik för småhus 2012, ES 2013:05. (Energy statistics for one- and two-dwelling buildings in 2012).*

Source: Wikipedia, 2014, *Direktverkande elvärme. (Direct electricity for heating).*

Source: Wikipedia, 2014, *Kärnkraft i Sverige. (Nuclear power in Sweden).*

4. Low prices of electricity and of electricity certificates

Description of the barrier:

Since many district heating plants are combined heat and power plants (so-called CHP), is one of the major factors of feasibility to produce heat at a competitive price, the price of electricity and of electricity certificates. Revenue from the sale of electricity is therefore very important for the profitability of these combined heat and power plants. As a consequence, one of the most severe barriers, also for renewable energy sources used for heating purposes are the low prices of electricity and of the electricity certificates.

According the Swedish Bioenergy Association's (Svebio) calculations, one can through the use of district heating as a cooling circuit, and with high efficiency, increase electricity generation in the country's bioenergy-powered heating plants from today's supplement 10 TWh to closer to 30 TWh.

Competent authority or body:

The Parliament and the Government, the Swedish Energy Agency and large corporations. Their unwillingness to adjust the electricity certificate system worsens the situation for producers of renewable electricity in all areas.

Causes of the barrier:

The Parliament and the Government are responsible of the electricity certificate system. The Swedish Energy Agency has demonstrated a high inertia on the issue. It is likely that large corporations had a significant impact. Sweden's former Government has lacked ambition in terms of renewable energy and sustainable development because they have had too much emphasis on nuclear power. This also leads to lower profitability for CHP that besides heat also depends on being able to sell electricity.

Consequences of the barrier:

Too low price of electricity from renewable energy leads to profitability problems for such power generation and as a result, reduced initial investments. CHP investments that depend on the sale of electricity are postponed or do not get off.

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Recommendations:

The quota levels, in the electricity certificate system, can be increased almost immediately to increase the demand for electricity certificates. Provide electricity intensive industries a certain quota, which they currently lack, to graze the huge surplus of certificates. This quota obligation for electricity-intensive industries can be increased gradually so that a continuous adaptation can take place. Follow-up continuously how well the electricity certificate system work and make continual, if necessary, adjustments to the regulatory framework. In the longer term (1 year or more), should a Swedish feed-in system (minimum price, SEK/kWh) for new investments in renewable power generation, according to Finnish/Irish/UK/German model be introduced. Introduce a guaranteed minimum price at a level that makes investments profitable and secure. Let the market phase out nuclear power, to get rid of surplus electricity leading to extremely low electricity prices.

Information source:

Name: Carl Olov Persson, Olof Karlsson, Peter Danielsson, Göran Bryntse

Organisation: SERO

Name: Annika Johannesson

Organisation: Swedish District Heating Association (Svensk Fjärrvärme)

Name: Lars Andrén

Organisation: Swedish Solar Energy Association (Svensk Solenergi)

5. The Government's unwillingness to aim high

Description of the barrier:

Sweden already, 2012, reached 50% of RES as they have set as a target for 2020. To get started with reasonable discussions of policy instruments for RES, as well as increased investment and technology development, the Swedish Government has to raise the targets to a sensible level.

Competent authority or body:

The Government and the Parliament. Their low ambition degrades the position of all renewable energy in Sweden.

Causes of the barrier:

You cannot get any reasonable explanation to why the Swedish former Government has set the relatively low target for 2020.

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Consequences of the barrier:

In Sweden we have a very good capacity to achieve over 70% renewable energy by 2020. If the Government is satisfied (for the next 6 years until 2020) with not making any further efforts, all development and new installation of RES will be reduced. It also means that the Government do not need to make efforts on the issues that are barriers to RES today.

Recommendations:

The Government should urgently raise the target for renewable energy so that it aims to a level that corresponds to what Sweden actually is able to deliver, i.e. 70% or higher in 2020. By 2030, 100% or even higher, renewable energy can be exported, technology expertise can be built up and be exported. Renewable energy comes to more than the environment, in the long term the Swedish high-tech industry must be preserved for future Swedish prosperity. Renewable energy and environmental technologies is an opportunity that must not be Swedish Industry and Sweden by. This is a chance we should not miss. It is important to have challenging targets that are constantly raised in line with the developments taking place. It is important that the politicians here have good foresight. Challenging targets spurs. This is something that must be continually investigated and updated.

Information source:

Name: Mariell Mattison

Organisation: SERO

6. Poor support scheme and lack of regulatory framework for establishment

Description of the barrier:

Sweden lacks clear support systems and ambitious targets for establishment of renewable energy. This leads to delay of new establishment of renewable energy. Solar, wind and biogas are most affected. The barrier has become increasingly relevant in recent years.

Competent authority or body:

The Government, the Parliament, the Swedish Energy Agency, as well as municipalities and county councils.

Consequences of the barrier:

It causes a delayed and uneven establishment of new RES facilities.

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Recommendations:

The Government should establish clear and ambitious objectives and interim objectives, and further more adapt legislative and regulatory framework to achieve the objectives.

Information source:

Name: Göran Bryntse, Peter Danielsson

Organisation: SERO

Name: Lars Andrén

Organisation: Solar Energy Association of Sweden (Svensk Solenergi)

7. No political plan for solar heating in Sweden

Description of the barrier:

Concerning solar heating, there is no political plan for solar heating in Sweden, covering issues like economical support, educational measures and research investments. This energy source has great potential and needs a sound support system to be able to be developed.

Competent authority or body:

The Swedish Government and the Parliament.

Consequences of the barrier:

It causes a delayed establishment of new solar heating.

Recommendations:

Introduce support measures for solar heating in Sweden, covering issues such as economic investment, training and research grants. This is to as quickly as possible to develop this energy source with great potential and need of a good support system.

Information source:

Name: Peter Danielsson

Organisation: SERO

Name: Lars Andrén

Organisation: Swedish Solar Energy Association (Svensk Solenergi)

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8. Prohibition on heat pumps in some municipalities

Description of the barrier:

Some municipalities forcing property owners to accede to the district heating, and thus prevents the property owner to install heat pumps. The barrier affects all renewable energy sources except for district heating. The Swedish Competition Authority has sued the City of Växjö who had such a ban. It is hoped to get an indicative sentence.

Competent authority or body:

The Government, the Energy Agency, the Competition Authority and the municipalities.

Causes of the barrier:

Some municipalities in Sweden believe that heat pumps are a poor choice for the environment, compared with district heating (and pellets).

Consequences of the barrier:

Property owners get more difficult to install heat pumps, as they are forced to invest in a district heating connection, even if they not intend to use that system. Furthermore, the costs will increase when they appeal against such decisions.

Recommendations:

The Government should legislate against this kind of contract. The Competition Authority should prohibit this type of contract. Municipality of Växjö has been sued.

The Swedish Energy Agency and the Environmental Court have acted in the problem. According to a ruling of the Environmental Court, a heat pump installation cannot be said to be less environmentally friendly than district heating.

Information source:

Name: Martin Forsén

Organisation: Nibe

This barrier may be about to disappear. Await judgment against the City of Växjö.

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9. Lack of information to inhabitants

Description of the barrier:

The knowledge of renewable energy among inhabitants is not sufficiently widespread today. This means that demand for renewable energy is held back, which in turn holds back the development of RES. The barrier has always existed and affects all types of RES in all sectors.

Competent authority or body:

The Government, Agencies and big corporations.

Causes of the barrier:

Decision makers have not yet found the right way to distribute information, when it comes to reaching out to the general crowd with correct information.

Consequences of the barrier:

For ordinary people, it is not obvious to invest in renewable energy, because they have not yet understood the importance of sustainable development.

Recommendations:

Sweden has direct mailing to almost all households with different types of community information. Use that channel to spread useful information that is easy to understand. Spread even more information to school students so that renewable alternatives are a matter of course when they reach adulthood.

Use social media to get information out to people and have an ongoing dialogue with them.

Keep inspiring and fun debates on television and in newspapers, with talented speaker who reaches out to listeners. Do not use politicians who refuse to answer a direct question.

Launch a national website with information that is written and then run by those who are professional writers - not bureaucrats, and make sure to launch it properly!

You cannot make the right decision if you do not get proper information – if you get proper information, you cannot avoid making the right decision!

Information source:

Name: Mariell Mattison

Organisation: SERO

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TRANSPORT

Summary

Today, there is uncertainty as regards the introduction of biofuels because of the lack of long-term policy decisions on policy instruments. This leads to a reluctance to invest in facilities for the production of renewable fuels. It is important that these fuels in the long term are tax exempted to make investments in such production to be economically interesting. Those who will invest in the production of renewable fuels must know that these are long-term profitable to invest in the often very costly facilities needed for the production. It is also important that financial resources are allocated for research and development of the second and the third generation biofuels.

EU state aid rules on overcompensation forces a heavier taxation of FAME (transesterified vegetable and animal oils) and maybe even E85 (85% ethanol, 15% gasoline). The reason for this is that these fuels received a tax exemption which led to their price over a period was lower than for the corresponding fossil fuels. This is not allowed under EU state aid rules. One consequence of this is that the biofuels FAME and E85 are at risk of a significantly reduced use. This risks leading to increased emissions of greenhouse gases, in that more fossil fuel is used instead, until the second and third generation biofuels are introduced and have received the same use as the FAME and E85 have now received. Another problem is that within the EU there is a reluctance to arable land is used for biofuel production. This resistance is due to that in some developing countries have e.g. rainforests been cut down for the production of biofuels, which has led to large amounts of greenhouse gases released (e.g. cultivation of oil palm in former rainforest areas for palm oil). Wrongly believed that this applies to all biofuels, although large vast areas of farmland in the EU and neighboring areas lying fallow due to overproduction of food.

1. Obscure policy instruments for biofuels

Description of the barrier:

Bio-energy is the largest source of energy in terms of final energy use in Sweden. But at present there is no clear information about policy instruments for biofuels and that makes investments in new plants stops. This barrier is affecting bio-energy and biofuels in particular.

In connection with the withdrawal of the previously announced quota obligation, the uncertainty that exists on the market regarding the future policy instruments for the transport sector and

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biofuels have now been strengthened. Generally high-blend and pure biofuels remains tax exempted. It has not reported how long the exemption will apply, which means that there is continued uncertainty. However, the Government has proposed that the tax exemption for high-blend FAME (transesterified vegetable oil) is reduced, as well as the reduced tax for low-blend FAME is reduced. The same applies ethanol (E85 and low-blend). This means that all FAME and ethanol, both low- and high-blend, will with this proposal be taxed. For HVO (hydrogenated vegetable oil) it is proposed that this is tax exempted entirely. HVO has previously been tax exempt up to 15 percent blend. In the Budget (Budget Bill 2014/2015:1) will be notified that you should have a new system for biofuels in place 1 January 2016.

It has been opened for imports of ethanol with poor climate performance, leading to the importation of cheap ethanol can enforce a closure of the Swedish bio-ethanol production.

Competent authority or body:

The European Commission and the Swedish Government.

Causes of the barrier:

The entire policy instrument system is under investigation (SOU 2013:84; Fossilfrihet på väg; Fossil freedom on the road), and after this has been presented one has not been able to take the necessary decisions. In the Budget (Budget Bill 2014/2015:1) will be notified that you should have a new control system in place 1 January 2016.

Consequences of the barrier:

There are uncertainties about the conditions for long-term investments. This leads to reluctance to make investments in biofuel production.

Recommendations:

It is of the greatest importance that the Government immediately invites to talks with all parliamentary parties and creates a broad agreement on how the target of a fossil-free fleet of vehicles should be achieved. There is today a broad consensus among transport operators on the framework for how future policy instruments should be designed. The party political talks should be started from the basis of the statements of opinion from the investigation Fossil freedom on the road (SOU 2013:84; Dnr N2014-7434-E). In connection with the statements of opinion management in efforts to introduce long-term targets and policy instruments for the transport sector should also be an industry council established. Biofuels should be long-term tax exempted.

The proposed unilateral removal of the tax credit for FAME (transesterified vegetable oil) and ethanol should be abolished. EU state aid rules on the overcompensation should be revised to clearly allow support for biofuels.

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The authorities are aware of the obstacle but barriers remain and there is an urgent need to fix the problem.

Information source:

Name: Kjell Andersson

Organisation: SVEBIO (The Swedish Bioenergy Association)

Source: Regeringskansliet 2014-07-03. Ändrad beskattning av vissa biodrivmedel. (Changed taxation of certain biofuels).

2. EU state aid rules on overcompensation forces a heavier taxation of biofuels

Description of the barrier:

EU state aid rules on overcompensation forces a heavier taxation of FAME (transesterified vegetable and animal oils) and maybe even E85 (85% ethanol, 15% gasoline). The reason for this is that these fuels received a tax exemption which led to their price over a period was lower than for the corresponding fossil fuels. This is not allowed under EU state aid rules. Not to force the producers to repay this tax with interest, the state must now reduce or remove this tax exemption or even taxing these fuels harder. This means that these fuels are at risk of a significantly reduced use. It would be natural if fossil fuels were taxed with a tax equivalent to their content of fossil carbon. Biofuels should be exempt from this tax. The Swedish Government has requested an extension of the exemption until 31 December 2016. Until then, the Government will consider other ways to support biofuel use, including quotas. The above described state aid rules can reasonably be questioned. Also other biofuels such as biogas can be affected.

Competent authority or body:

The European Commission, the European Parliament and the Swedish Government.

Causes of the barrier:

The biofuels FAME (transesterified vegetable and animal oils) and E85 (85% ethanol, 15% gasoline) have received a tax exemption which led to their price over a period was lower than for the corresponding fossil fuels. This is not allowed under EU state aid rules.

Consequences of the barrier:

The biofuels FAME (transesterified vegetable and animal oils) and E85 (85% ethanol, 15% gasoline) are at risk of a significantly reduced use.

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Recommendations:

Modify EU state aid rules to allow renewable fuels, such as biofuels, may have a tax credit, so their price can be somewhat lower than the fossil counterparts. In addition, the EU state aid rules should be changed so that one should not be forced to tax away biofuels, that during a period due to a tax credit or a support been cheaper than their fossil counterparts. Price competition between biofuels and fossil fuels must be allowed as well as competition between different biofuels.

Information source:

Name: Kjell Andersson

Organisation: Svebio

Name: Sven Bernesson

Organisation: SERO

Source: Dagens industri 2015-03-18. Prischock väntar för miljöbränsle.

Source: Vi Bilägare 2015-03-19. Skatten på E85 höjs vid årsskiftet.

Source: ATL - Lantbrukets Affärstidning 2015-03-20. Bara fossila bränslen gynnas.

Source: Energimagasinet 37(2) 2015 s 6. Regeringen ber EU om förlängd skattebefrielse f biodrivmedel.

3. Resistance in the EU towards agricultural land is used for biofuel production

Description of the barrier:

Within the EU there is a reluctance to arable land used to produce biofuels. This resistance is due to that in some developing countries have e.g. rainforests been cut down for the production of biofuels, which has led to large amounts of greenhouse gases released (e.g. cultivation of oil palm in former rainforest areas in Indonesia for palm oil). There are also reports that biofuels (such as ethanol from corn) has been produced with such high inputs of fossil energy, in such bad conditions so that the fuel in question contributed to more greenhouse gas emissions than their fossil counterparts, but this is not the norm, it is an extreme case. Following these scandals, there has been a distrust of all biofuels produced and especially on arable land. The aforementioned biofuels with poor climate performance are stopped today effectively within the EU by the Renewable Energy Directive (RED). Today, a new production chain must reach 50 percent greenhouse gas reduction, and within a few years (after 1 January 2018 for plants started after January 1, 2017) 60 percent. All biofuels in the Swedish market meet these requirements, the majority by a wide margin. In EU one wishes to put ILUC (Indirect Land Use Change) factors (which are highly uncertain and highly dependent on the assumptions made) against all fuels from agricultural crops such as cultivation of these would make forests (in many cases rainforest) must be cut down in a third country to replace the production of

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food at this arable land that now instead become biofuels. This reasoning is incorrect because in the EU there is an overproduction of food, and in addition there is a surplus of about 10 million hectares of agricultural land that lays fallow of a total of about 130 million hectares. Biofuels grown in the EU mainly affect land use in their local area. Near the EU in Eastern Europe there are also large areas of arable land that is not used. However, it is very important to have control of the biofuels sold. They should not have to originate in countries/arable land where they lead to deforestation, huge emissions of greenhouse gases in the cultivation or are produced inefficiently with high inputs of fossil fuels. Any type of declaration of origin is therefore needed. The use of first-generation biofuels from agricultural crops should not be restricted in the EU, as long as there is a surplus of food and farmland in the EU. It is wrong to impose a ceiling on the use of first-generation biofuels as this stops the introduction of biofuels and leads to increased greenhouse gas emissions due to the continued use of fossil fuels. The use of first-generation biofuels should on the contrary be supported by way of example, tax credits and grants. Both ethanol and biodiesel (transesterified or hydrogenated vegetable or animal oil) can be produced from waste products, ethanol from cellulose-rich ones (e.g. straw, garbage or wood) and biodiesel from used cooking oil. Such raw materials cause definitely no ILUC. Second and third generation biofuels originating in cellulose-rich waste and forest products should of course be supported by tax exemptions and grants. Ambitious targets for the use of these should be added, significantly higher than the 0.5% and 1.5% respectively discussed now. It is important that the infrastructure currently built for the production and distribution of first-generation biofuels may remain and come second and third generation biofuels to the part. This is to quicker get them on the market. It is important to clarify that for Sweden and Finland with large reserves of timber, previously used for paper production, is forest for third generation biofuels an opportunity with great potential to be a future basic industry and to make these countries into world leaders in a future state of the art technology. A large proportion of these biofuels could be exported to other EU countries and thus help them to achieve their environmental targets.

Competent authority or body:

The European Commission, the European Parliament and the Swedish Government.

Causes of the barrier:

Within the EU there is a reluctance to arable land used to produce biofuels. In EU one wishes to put ILUC (Indirect Land Use Change) factors (which are highly uncertain and highly dependent on the assumptions made) against all fuels from agricultural crops such as cultivation of these would make forests (in many cases rainforest) must be cut down in a third country to replace the production of food at this arable land that now instead become biofuels. This reasoning is incorrect because in the EU there is an overproduction of food, and in addition there is a surplus of about 10 million hectares of agricultural land that lays fallow of a total of about 130 million hectares. Biofuels grown in the EU mainly affect land use in their local area.

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Consequences of the barrier:

The use of first-generation biofuels from agricultural crops will be restricted in the EU. There is introduced a ceiling on the use of first-generation biofuels.

Recommendations:

Remove restrictions against biofuels decided within the EU. Introduce any kind of certification that ensures that biofuels sold meet the rigid climate targets. Introduce tax exemption and long-term support for the introduction of second and third generation advanced biofuels.

Information source:

Name: Kjell Andersson

Organisation: Svebio

Name: Sven Bernesson

Organisation: SERO

Source: European Commission. 2012. Brussels, 17.10.2012. SWD(2012) 343 final.

Commission staff working document. Impact assessment. Accompanying the document.

Proposal for a Directive of the European Parliament and of the Council: amending Directive 98/70/EC relating to the quality of petrol and diesel fuels and amending Directive 2009/28/EC on the promotion of the use of energy from renewable sources.

Source: European Commission. 2012. Brussels, 17.10.2012. COM(2012) 595 final.

2012/0288 (COD). Proposal for a Directive of the European Parliament and of the council: amending Directive 98/70/EC relating to the quality of petrol and diesel fuels and amending Directive 2009/28/EC on the promotion of the use of energy from renewable sources.

Source: SLC - Tidningen Landsbygden Folk 2015-04-17. EU-parlamentet röstade för biobränslekompromiss.

Source: ATL - Lantbrukets Affärstidning 2015-03-20. Bara fossila bränslen gynnas.

Source: Dagens Nyheter, Motor, Lördag 14 mars 2015. Sid 27. Tuff slutstrid i EU om gröna bränslen.

Source: Skogsland, Nr 11, 6 mars 2015. Sid 2. De nya EU-besluten riskerar gå upp i rök.

4. Lack of profitability

Description of the barrier:

New installations are held back when the pricing is too poor for renewable energy. The barrier affects biogas and biofuels.

Competent authority or body:

The Government and the market.

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Causes of the barrier:

Inertia in the system causes delays in decisions.

Consequences of the barrier:

Today there are several proven techniques, which are not used due to the inertia of the system. These techniques would be very easy to use in production if the right conditions had existed.

Recommendations:

The Government should introduce some form of financial incentives and stimuli which would lead to the production of renewable fuel is accelerated. This would also mean greater demand for renewable energy installations, which in turn leads to lower production costs. It is also important that there is a long-term perspective on the demand and price - and that it is independent of any political changes.

Information source:

Name: Anders Forsbom, Mattias Nordström

Organisation: SWECO

Name: Ann Segerborg-Fick

Organisation: JTI - Swedish Institute of Agricultural and Environmental Engineering (Institutet för jordbruks- och miljöteknik)

5. The Government's unwillingness to aim high

Description of the barrier:

Sweden already, 2012, reached 50% of RES as they have set as a target for 2020. To get started with reasonable discussions of policy instruments for RES, as well as increased investment and technology development, the Swedish Government has to raise the targets to a sensible level.

Competent authority or body:

The Government and the Parliament. Their low ambition degrades the position of all renewable energy in Sweden.

Causes of the barrier:

You cannot get any reasonable explanation to why the Swedish former Government has set the relatively low target for 2020.

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Consequences of the barrier:

In Sweden we have a very good capacity to achieve over 70% renewable energy by 2020. If the Government is satisfied (for the next 6 years until 2020) with not making any further efforts, all development and new installation of RES will be reduced. It also means that the Government do not need to make efforts on the issues that are barriers to RES today.

Recommendations:

The Government should urgently raise the target for renewable energy so that it aims to a level that corresponds to what Sweden actually is able to deliver, i.e. 70% or higher in 2020. By 2030, 100% or even higher, renewable energy can be exported, technology expertise can be built up and be exported. Renewable energy comes to more than the environment, in the long term the Swedish high-tech industry must be preserved for future Swedish prosperity. Renewable energy and environmental technologies is an opportunity that must not be Swedish Industry and Sweden by. This is a chance we should not miss. It is important to have challenging targets that are constantly raised in line with the developments taking place. It is important that the politicians here have good foresight. Challenging targets spurs. This is something that must be continually investigated and updated.

Information source:

Name: Mariell Mattison

Organisation: SERO

6. Poor support scheme and lack of regulatory framework for establishment

Description of the barrier:

Sweden lacks clear support systems and ambitious targets for establishment of renewable energy. This leads to delay of new establishment of renewable energy. Solar, wind and biogas are most affected. The barrier has become increasingly relevant in recent years.

Competent authority or body:

The Government, the Parliament, the Swedish Energy Agency, as well as municipalities and county councils.

Consequences of the barrier:

It causes a delayed and uneven establishment of new RES facilities.

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Recommendations:

The Government should establish clear and ambitious objectives and interim objectives, and further more adapt legislative and regulatory framework to achieve the objectives.

Information source:

Name: Göran Bryntse, Peter Danielsson

Organisation: SERO

Name: Lars Andrén

Organisation: Swedish Solar Energy Association (Svensk Solenergi)

7. Discrimination subsidization

Description of the barrier:

The development of biofuel is slowing down when fossil fuels are subsidized in to an excessive degree. This is a barrier for all bioenergy, but mainly complex systems for biogas and biofuel suffer.

Competent authority or body:

The European Parliament, the Government and the market.

Causes of the barrier:

Globally, fossil fuels are 6 times as much subsidized as biofuels, leading to the fact that the Swedish Government and the Swedish market not completely overall can affect the price of renewable fuel.

Consequences of the barrier:

Poor subsidizing renewable fuel causes the development of renewable fuel to slow down. Particularly affected areas are immature systems with a complex technology.

Recommendations:

There should be a system that takes into account different degrees of maturity, where less mature technology get better support, in form of increased subsidization.

The fossil oil, which is a very mature technology, should not be subsidized at all. Stimulus should be designed in such a way that the market demands renewable fuels. Information should be provided so that it becomes a broader thinking, making the populace understands the need to pay more for non-renewable energy.

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Information source:

Name: Anders Forsbom, Mattias Nordström

Organisation: SWECO

8. There is not enough of charging stations for electric cars

Description of the barrier:

There is not enough of charging stations for electric cars. This slows the introduction of electric cars. Charging stations that can charge electric cars quickly is required to make it possible for these to be used over longer distances. One normally does not have time to wait for a slow charging of an electric car when you want to go a longer distance. Although if the car is used for business purposes it is required that it can be charged quickly. In both cases, it must be charged during a normal break that is 0.5-1 hours. This requires a well-developed network of reliable rapid chargers scattered all over the country and even within the EU. It is also appropriate that these are related to the places where people normally rest, as service areas along roads, roadside restaurants and petrol stations. For this to be realized are governmental investment grants for the construction of public charging stations for electric cars required.

Competent authority or body:

The Government, the Parliament, the European Commission and the European Parliament.

Causes of the barrier:

There is not enough of charging stations for electric cars.

Consequences of the barrier:

The introduction of electric cars is slowed down.

Recommendations:

Introduce any form of state aid for the construction of public charging stations for electric cars.

Information source:

Name: Sven Bernesson

Organisation: SERO

Source: Ny Teknik 2013-01-25. EU-krav på tankstationer för alternativa bränslen.

Source: Ny Teknik 2014-04-16. Bristen på laddstationer bromsar elbilen.

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9. There are not enough hydrogen fueling stations for fuel cell cars

Description of the barrier:

Today, there is one mass production car powered by hydrogen via fuel cells. Several other manufacturers are also underway in the near future. For these vehicles to be introduced in the market it requires a network of hydrogen filling stations is being expanded. It is important that these filling stations covering the whole country and even the EU for that the fuel cell technology will have a wide spread. For this to happen, any type of investment grants for the construction of these filling stations is needed. It is also important that development aid/support is introduced for developing the technology surrounding both the storage of hydrogen at filling stations and how the filling stations should be performed.

Competent authority or body:

The Government, the Parliament, the European Commission and the European Parliament.

Causes of the barrier:

There are not enough hydrogen fueling stations for fuel cell cars.

Consequences of the barrier:

The introduction of fuel cell cars is slowed down.

Recommendations:

Introduce any form of state aid for the construction of hydrogen fueling stations for fuel cell vehicles. Introduce development aid/support for the development of the technology on both the storage of hydrogen at filling stations and how the filling stations should be performed.

Information source:

Name: Sven Bernesson

Organisation: SERO

Source: *Ny Teknik* 2013-01-25. *EU-krav på tankstationer för alternativa bränslen.*

Source: *Dagens industri* 2015-05-02. *Så imponerande är vätgasbilen.*

10. There are not enough filling stations for biogas cars

Description of the barrier:

Today there are about 200 places, mainly in southern and western Sweden as well as in Mälardalen where you can refuel biogas. This is not sufficient for vehicles that can run on biogas will get a wider

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spread. This despite the fact that the passenger cars which are intended for biogas also has a smaller petrol tank and can run on petrol when there is no biogas available. It is therefore important that some type of aid/support is introduced for the construction of filling stations for biogas in Sweden, but also in the EU. It is important that the filling stations are available throughout the country. For there to be access to biogas for vehicles, it is also required to aid/support are introduced for the costly upgrading plants of biogas. Support/aid is also needed for the construction of biogas plants in order to get as large a spread as possible of this environmentally friendly technology. For the best performance (with low gas losses), it is of course important that the best technology is used both in biogas plants and the upgrading plants. Older plants may need support/aid to upgrade to newer and better technology.

Competent authority or body:

The Government, the Parliament, the European Commission and the European Parliament.

Causes of the barrier:

There are not enough filling stations for biogas cars.

Consequences of the barrier:

The introduction of biogas cars is slowed down.

Recommendations:

Introduce any form of state aid for investments for the construction of filling stations for biogas cars. Investment aids are also needed for the costly upgrading plants, new biogas plants and for upgrading older plants with newer, better and more environmentally friendly technology.

Information source:

Name: Sven Bernesson

Organisation: SERO

Source: Biogas.se 2015-05-02. Biogas nära dig – tankstationer tunt om i Sverige.

<http://www.biogas.se/ombiogas/tankahar>.

11. Lack of information to inhabitants

Description of the barrier:

The knowledge of renewable energy among inhabitants is not sufficiently widespread today. This means that demand for renewable energy is held back, which in turn holds back the development of RES. The barrier has always existed and affects all types of RES in all sectors.

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Competent authority or body:

The Government, Agencies and big corporations.

Causes of the barrier:

Decision makers have not yet found the right way to distribute information, when it comes to reaching out to the general crowd with correct information.

Consequences of the barrier:

For ordinary people, it is not obvious to invest in renewable energy, because they have not yet understood the importance of sustainable development.

Recommendations:

Sweden has direct mailing to almost all households with different types of community information. Use that channel to spread useful information that is easy to understand. Spread even more information to school students so that renewable alternatives are a matter of course when they reach adulthood.

Use social media to get information out to people and have an ongoing dialogue with them.

Keep inspiring and fun debates on television and in newspapers, with talented speaker who reaches out to listeners. Do not use politicians who refuse to answer a direct question.

Launch a national website with information that is written and then run by those who are professional writers - not bureaucrats, and make sure to launch it properly!

You cannot make the right decision if you do not get proper information – if you get proper information, you cannot avoid making the right decision!

Information source:

Name: Mariell Mattison

Organisation: SERO

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