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Field of work Bioenergy technology- and economy

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Background

3N The Competence Centre Lower Saxony – Network Renewable Resources (3N) is the state advice centre which carries out consultations, concepts and projects in the field of renewable resources.

Project VitaalEems The project VitaalEems focused on wood from maintenance work of hedgerows on banks and analysed more in detail the amounts of produced wood, processing capabilities, costs and utilisation. The project was carried out by 3N on behalf of the county Leer and in collaboration with the Dienst Landelijk Gebied in the province of Groningen in the Netherlands.

With the municipality Uplengen (county Leer), which already operated a wood heating plant with landscaping material in a kindergarten, it was worked closely in the framework of VitaalEems. In addition, two sites (small settlements) in the province of Groningen were involved in the project.

In these three places the potential of landscape maintenance wood from hedgerows on banks was examined selectively. Typical maintenance work was monitored and the wood harvest, quantities and qualities observed. The wood chips obtained were examined by 3N in the laboratory at the University of Göttingen and in a further step pressed into pellets, which were also analysed in detail. Accordingly, different uses of this landscape maintenance material were regarded.

Used harvesting methods At the project sites in principle two harvesting methods are applied. Either the biomass is chopped immediately after harvesting and the wood chips are stored and dried in a different place, or, and this is especially the case in the Netherlands, the material is left next to the hedge for a longer period and is chopped at a later date.

In the first case the municipality Uplengen already ran a small wood heating system before the start of the project and there the wood chips were covered in a barn but stored ventilated. With that amazingly low water contents are obtained, which could be confirm by measurements of 3N.

In the second case the material usually lays not along a road but in a field next to the hedge, which is located on a narrow track and from where it is taken up by the chipper with a large grabber. While this represents an additional operation step, it



saves drying costs and the workflow can be organised more independent. However, the wood chips generally still must be stored temporarily because of logistical reasons.

Currently, mostly large plants are operated in Holland, so power plants that do not necessarily need very dry wood. Because of this, the effect of pre-drying was not as crucial for the work in the VitaalEems project.

Legal regulations

During the project no regulations prevented the utilization of the wood from hedgerows on banks in Uplengen. On the contrary, at the level of the municipality the interest was very high to do the maintenance work of the hedges on banks, what is why 3N has also been invited to make the project at this location.

Model according to nature protection

When maintaining and conserving hedges there are always legal regulations from nature protection by which the work is directed (e.g. harvest period). However, there are no special conditions that dictate a specific approach.

Nevertheless, 3N has created a model for VitaalEems, which builds on principles of nature conservation and basically says that not too many kilometres of hedges should be cut in a short time. This wouldn't be conducive neither to nature protection nor public acceptance. Instead, it is recommended every ten years to harvest one tenth, hence to remove one percent of the stock per year. This was the approach that was used for the project.

Definition as waste

During the project period of VitaalEems the question about the waste definition of wood maintenance work of hedgerows on banks has not risen and accordingly was not further investigated.

Easter fires in de county Leer

In the long term it is the goal to decrease the size of the Easter fires in the county of Leer. However, since at the moment there is no great harvest of wood from hedgerow on banks, this is not a pressing topic. The municipality Uplengen as well as the county of Leer want to better organise the hedge maintenance work. This will then surely cause that the produced woody biomass no longer ends up in Easter fires, but is rather used cost-effective and environmentally friendly for energy production.

Federal Emission Protection Directive

With the new, more stringent immission protection regulation for wood furnaces in Germany a discrepancy is particularly striking. In Lower Saxony many small fireplaces are installed; about 1.1 million individual, not automatically fed furnaces. This number of individual fireplaces presents with regard to high pollution values certainly the much larger problem. This is because in these fireplaces a simple combustion technology is applied, not always the optimal wood is burned and many of these furnaces are often used incorrectly. Strangely, this is relatively little criticised. But if large plants are to be built, it is immediately argued with high dust emissions.

In connection with wood from hedge rows no problems have arisen in this respect, but with different wood types 3N has been faced with concerns about the immission. Often, these can then be invalidated with an excursion to an existing plant.

The new legislation is rather unfair because for large systems very low pollution limits are required. Individual fireplaces however, are tested at the factory under

the best conditions only once and then the user is free on how to handle the system. It would be desirable if the strict values for large plants are milder, but this is difficult. Therefore, it is a more realistic approach to treat the small fireplaces also more severe. Would this be implemented much woody biomass could be processed to wood chips or burned in boilers for logs instead of being used in small stoves. Such a development, however, is of course difficult to predict.

In this context, it would also be important to raise awareness that not everything can be thrown into the small fireplace. This in turn stands and falls with the supervision of the regulations. With 891 sweep districts in Lower Saxony where 3000 chimney sweepers are working, the control depends on many individuals which judge sometimes more, sometimes less severe.

Influence of the government

Not changeable are the legal specifications from nature protection, especially the timeframe for harvest, and the immission regulations, which apply to all types of wood. Thus, the beginning and the end of the production chain are basically set. In between, there are not necessarily opportunities to take influence at the top level, i.e. at the federal level, but rather at the local level.

Municipal level

It is important for municipalities to know how the maintenance work and further utilization can be organized and how the individual players can find each other properly.

The influence of the municipality, for example, on biogas plants can be very different. In an agricultural area, the community certainly has a role in the steering of such projects; however, many farmers will not want to be led in their decisions. They are entrepreneurs and don't want necessarily to be patronized by the local authority. Usually, the municipalities also have an interest that the local agriculture continues to go well, but then they also want to benefit and then support heating networks in town.

3N has realized approximately 50 heat utilization concepts and it has been shown that without the support of the municipality, the implementation is difficult. Not only because the cable cannot be laid into the road, but also because then not all people can be connected. And if, for example, an outdoor swimming pool can further be economically operated with energy from a new plant, it is very important, that the municipality communicates very clearly that it supports such a project. In this respect, the municipality does have an influence on the implementation of energy projects.

Public acceptance

Public acceptance of the project VitaalEems and the subject of management of hedgerows on bank was generally very good. The municipality Uplengen had taken good care of where the cuttings took place and in Holland the locations were anyway very isolated.

Public information events VitaalEems

In Holland no public information sessions were held on the subject. The involved nature conservation association had no interest and a local resident, who liked to activate his neighbours, could not implement it due to personal reasons.

In Germany, around April 2016, i.e. after completion of the project, an event for the

farmers and the owners of the areas and hedgerows on banks will take place. In this context the municipality would like to raise the awareness of the farmers that as owners they should manage the hedges and can sell the wood. It will be shown that the community has an interest in ensuring that the hedges are maintained and that the farmers carry out this work.

Situation in other projects In most cases people understand the concerns of projects in the field of sustainable energy.

In another project, the University of Göttingen has performed a detection of the stock of hedgerows on banks with a laser scan in the county of Göttingen. This is very complicated and could only be done because there are few hedges in the county. In this southern region of Lower Saxony the public perception of hedgerows on banks is different than in the north, where they have an important tradition. Because of this more communication had to be done in this project.

For projects related to biogas plants, modern agriculture affects a large part of the conflict. The public debate always depends quite strongly on what is already operating in agriculture and livestock farming in a given region and how that changes with a new project.

Difficulties & barriers in the project VitaalEems

Coordination The coordination of hedgerow owners, maintenance companies, chipping entrepreneurs and end users with the aim to obtain the best possible workflow was difficult.

Cost allocation The distribution of costs is related to the coordination of the actors involved. In extreme cases, nature protection argues that with the burning of the landscaping material such great savings of heating oil are achieved, that the transport, chipping, drying and maybe even cutting can be paid through it. The actor, who uses the biomass energetically at the end, however, argues the reverse. Since the hedges have to be cut anyway and the material must be transported away, for which it should be so chopped, he pays just the last transport. To find a fair limit is certainly still to be negotiated. 3N has made a proposal which said that the maintenance, cutting and transporting away are the responsibility of the hedge owner, and transporting to the heating plant and chipping are then the responsibility of the energy producer. This was now stated in a first step and has yet to be discussed with the farmers.

Message

- Legal regulations*
- When maintaining and conserving hedges there are always legal regulations from nature protection by which the work is directed (e.g. harvest period). However, there are no special conditions that dictate a specific approach.
 - Proposed model for hedge maintenance by 3N for the VitaalEems project: harvest one tenth every ten years, hence remove one percent of the stock per year.
- Immission*
- Concerns about immission from wood firings can often be invalidated with an

regulations

excursion into an existing plant.

- Would the immission values of individual fireplaces in Lower Saxony also be more severe, much woody biomass could be processed to wood chips or burned in boilers for logs, rather than in small stoves. Such a development, however, is difficult to predict.
- It is important to raise awareness of the proper use of fireplaces (not everything can be burned in it).

Influence of municipalities

- Not changeable are the legal specifications from nature protection and immission regulation. The beginning and the end of the production chain are thus set.
- It is important for municipalities to know how the maintenance work and further utilization can be organized and how the individual players can find each other properly.
- Without the support of the municipality, the implementation of a project is difficult (e.g. lay cables into road but also connect all people).
- If public establishments (e.g. swimming pool) can continue to be operated economically with energy from a new plant the municipality should clearly communicate its support.

Public acceptance

- In most cases, people understand the concerns of projects in the field of sustainable energy.
- Traditions and culture have an important impact on the acceptance of the people when working with certain landscape features (e.g. hedgerows on banks in the south or in the north of Lower Saxony).
- The public debate always depends quite strongly on what is already done in a particular region so far and how the situation changes with a new project.