

Overview – The Austrian Example on biomass energy

Welcome to Biomass Thermal Energy Council’s podcast series. In our monthly podcasts, BTEC interviews key decision makers and pioneers of the biomass energy industry. This project is made possible by a grant from the U.S. Forest Service’s Wood Education and Resource Center.

In our first broadcast, we will discuss biomass energy in Austria.

Austria is a fine example regarding the use of biomass for energy. The share of biomass amounts to 12% of all energy consumption in Austria, and in states like Upper Austria, biomass heating provides more than 40% of all heating needs.¹

In the federal state of Upper Austria, the Upper Austrian Renewable Energy Agency has been responsible for this impressive achievement. Therefore, it is a great honor to welcome Christiane Egger, deputy manager of the Upper Austrian Renewable Energy Agency.

Ms. Egger is an energy policy expert. She is also the co-author of numerous energy plans and position papers on national and regional policies in the field of energy efficiency and renewable energy.

Welcome, Ms. Egger, and thank you for your time! The first renewable energy programs in Austria were started in the 1980’s. Ms. Egger, what were the reasons behind the early interest in renewable energy and who supported the initial development?

Biomass has always been an important source of energy, traditionally in Austria, but also in an innovative and modern way. In the 80’s and even dating back to the 70’s it became clear that fossil fuel energy sources would not be the optimal long term solution for securing the energy supply in our country. A main driver though at that time, of course, was not climate change considerations, because the word climate change was not even known at that time, but in fact the most important driving force came from the forestry sector and the farming sectors. Farmers and forest owners realized that just from food production alone economic survival would become more and more difficult, so they looked for new ways to secure their livelihood and they started becoming “heat entrepreneurs”; they started providing biomass fuel for heating. So the forestry sector was one of the first and important drivers. Then we had innovative entrepreneurs who are looking for ways to automatize (automate) biomass heating. So they want to get away from labor intensive, dirty ways of heating and to find ways to use biomass in a full automatic way so that it could compete from the user convenience and cost perspective with oil and gas. So these innovative entrepreneurs were the second important driving force in that process and thirdly, especially state policies for example in the state of Upper Austria, realized the economic possibilities biomass heating was offering; because, of course, fossil fuel energy sources have to be imported and what we don’t spend on importing fossil fuels creates added values and jobs here in the state and in the county. So I would say these three groups, the farming and forestry sector, the creative entrepreneurs, and state policies together started rethinking biomass heating policies, so

¹ RES-RL

the main driver did not come from climate protection, but from economic development and from the forestry sector.

Austria has made it a policy priority to reduce the reliance on fossil fuels, and that debate is going on in the U.S. as well, but the American policy debate is heavily centered on renewable electricity legislation.

Heating and cooling, which constitutes roughly 1/3rd of the energy consumption in the U.S., does not play a significant role in that debate. In your region in Upper Austria, 45% of all heating is renewable, with the lion's share of 95% met by renewable biomass. What has been the driving force behind that remarkable success in addressing renewable heating?

Well, one is certainly pure economic considerations. If you look at the cost for investment and for operations its very clear that if you look at avoiding costs for importing fossil fuels and you look at the different sectors, how much does it cost to replace fossil fuels in transport, fossil fuel in heating, and fossil fuels in electricity, it becomes quite clear that replacing heating is the cheapest option in terms of investment costs and in terms of operation costs. I would say the reason for the focus on electricity is mostly because it is maybe more visible, it's maybe more evident to people what they spend on the electricity bills and it's also a culture question, in colder climates, heating would play an more important role than in warmer climates where of course electricity for example for cooling but also for other applications is more at the focus of attention. What is also interesting when we looking at Europe is to see that mostly in larger countries, like in Germany, in France, in Spain, the focus was from the very beginning more on electricity production from the renewables where it's in smaller countries like Austria, or the Nordic countries they put more focus on renewable heating. What also becomes very clear in the policy debate we lead in the European Union is that absolutely we need both, we need renewable electricity and we need renewable heating, so every member state now has to make their own strategy how to split their renewable energy target and portfolio standards into the sectors: electricity, heating and transport. I think it's very interesting also in the US to make the calculation for replacing one kilowatt hour or one energy unit of electricity with biomass or with another renewable energy source or with replacing one kilowatt hour of heating with biomass and I'm very sure that the result of this calculation will be very much the same. That the costs for renewable heating are lower but of course this is not always reflected in the public support programs and of course these very much drive where the market goes in the substitution process so it is worth a while to have a look at the absolute costs and then to see how public programs change the economics of these substitution processes and to discuss also in policies whether it would not be worthwhile to also support renewable heating and not only electricity.

You've mentioned the public support programs, and one of your favorite tag-line to describe them is the stick, carrot and tambourine approach, which refers to legal measures, financial measures and information activities. Please elaborate on this three pillar approach and what makes it so successful.

These stick, carrot and tambourine approach takes the picture of a donkey and the donkey by itself may not be very interested in moving along, in changing, so you apply the stick so that's the legal and regulatory measures; you apply the carrot, that's the financial incentives; and you apply the tambourine – information, training and awareness raising - and with all these three different instruments together the donkey or the change in the market will happen a lot faster as if you apply only one of those. It's quite easy also if you think practically and we all have seen examples like that, you have a wonderful funding program but not enough people know about it, so it will be a lot less effective as if people understood that it exists in how it works. You have a very useful regulatory measure but again people don't know about it, they don't understand it, so it also is less effective. And of course you can do the best information and awareness raising measures but without any financial measures, progress will be a lot slower, so in fact by applying two or three of the pillars at the same time - so to simulate demand for renewable heating and at the same time also support supply - that is what makes the market change a lot faster, because we don't have too much time. We are already lagging behind in many respects in changing away from fossil fuels for heating, so a good way to speed up market transformation is by using these three pillar approach.

In your presentations you have been talking about the end of the oil-era in Austria. In the last decade, the share of oil-heating appliances has fallen from 36% to less than 1 % of all new installed appliances in Austria, whereas renewable energy technologies make up more than 85% of new heating appliances. How has that been possible and have you experienced resistance to this structural change?

Of course no change is without resistance. That is very clear, but what also becomes very clear if you have a policy framework in place where you take a step by step approach, you have financial incentive for more innovative, for the more advance measures; you have regulatory measures to set minimum requirements; and you have information and awareness raising measures to explain why this is a good thing. We found that if a home owner understands that a biomass heating system is a better solution for him in the short and long term, most of them will be prepared to change over to biomass. It's only if people don't understand or they don't have the right information at hand when they are taking a decision – it's not very useful and interesting to give someone information about biomass heating one year after he has bought a gas boiler - so the information has to come at the time when an investment decision is being taken anyway and it has to be explained well, what are the benefits, what are the drawbacks, and then we find that a large majority of people are willing to take the right decision, the one for renewable heating.

In 2030, Upper Austria is targeting to provide 100% of space heating from renewable energy. The Northeast and Northwest in the U.S. have a fairly similar heating pattern and availability of biomass resources. What would you advise your U.S. colleagues in state governments on the best approach to increase the share of renewable heating in their state?

I think the first thing is to understand the current situation, the resources, the present heating pattern, and then set a target. We find that it's very important over the last 20 years to have a target, a business plan if you want - every company should have a business plan, so should every state government - to have a business plan for renewable heating that tells: We want to be at the percentage of x by the year of y. So first to have a target and at the same time to develop measures, instruments, how to achieve that target. One important sector is public buildings - not an easy sector because money is short in public institutions around the globe, but nevertheless I think leading by example is very important in that field; so it's important to look at the own state buildings, to look where are buildings where we really consume a lot of heat, where are buildings where we need to replace the heating system anyway in the next years, does our state government for example also have own forestry resources and then to see can we do some pilot projects, can we have a learning process in state governments how to use biomass heating and then to move on from there. So first is leading by example for setting a target, leading by example in the public sector; then to see whether powerful coalitions with important actors in the state can be found. For example, in our country the whole farming and forestry sector has been a very important ally in all the discussions, because by using more biomass for heating, by having a better prices and stabler markets for forestry residues, we also support in an important way the local farming and forest owners community, so they can be a very important ally in this process. And then to look what are possibility to financially support renewable heating in the private and in the commercial sector, that depends of course the specific situation, and also, do we have in our portfolio the possibility to implement regulatory measure. So, for example, for Upper Austria, in our state, there is a law, it's an obligation, that any new building larger than 10,000 square feet, when its new constructed, has to be heated by renewable energy sources. Clearly, you need to have well developed supply chains and structures to implement such a regulation, but nevertheless there comes a time in the market development where this also can be considered, so look at the possibility you have in stick, carrot, and tambourine policies; fix a target and then try to get there with the instruments that are possible in your state.

Some environmentalists in the U.S. fear that an increase in bioenergy production will lead to clearing of entire forests to meet the demand. With the continuing growth of bioenergy in Austria, how do you address sustainability issues to meet increasing demand over the long run?

Austria has a more than 100 year tradition in sustainable forestry, so, in fact the word in German for sustainability comes from the forestry sector, the word we use in German "Nachhaltigkeit" means you use the forest in a way that your children and grandchildren can make the same use of these forests. So for us this is built on long tradition and we never - it's legally forbidden but it's also against tradition and the culture - to overuse our forests.

Most of the forests are owned by private families, so for them it's quite evident they don't cut the whole forest and then leave nothing for their children, this is not the way this is done traditionally. Of course, it's also important that a respective legal framework for

sustainable forestry is in place to ensure that the rules and the laws are made in a way that sustainable forestry is maintained while at the same time using biomass for heating. The good news is most of our biomass we use for energy is the residues from forestry. If you cut a tree, about half of the tree can be used for timber, 10 to 20 % needs to remain in the forest as fertilizer, but that means about 20 to 30 % can be used for energy purposes. That is just a side product of normal sustainable forestry. We are not at all advocating - and this is not how it is done in Austria and other EU countries - to use the whole tree for energy. We use the valuable part of the tree for timber, for construction, for anything else you need timber for, and only the residues for which there is no market, that is used for energy purposes. We have made a very detailed scientific analysis together with several universities when we set our target for 100% percent renewable heating for 2030 and it's quite cleared that we can reach these targets with our own forest residues, provided that the energy efficiency of the buildings can also be increased at the same time. Because, of course, the better the energy efficiency for the building, the less demand you have for biomass heating.

In the U.S., opponents of biomass project voice concerns that an increase in the use of biomass will have negative effects on human health, especially that particulate matter and other emissions will negatively impact the lung system and create problems for the elderly and children. What is your experience in this regard and how do you address this problem?

In Austria we have very, very strict emission standards for any biomass or for any heating systems. We have done something you can call "driving the market through standards", so every year we have set standards for the efficiency of the appliance and for the emissions and these standards have been tightened every few years over the last 1 ½ decades. So today biomass heating systems are very high efficiency and are low emissions. So we are in a position to say that modern biomass boilers will have no negative impact at all on human health and they can compete in terms of emissions with gas and modern oil boilers. What is, of course, important is not to use old technologies that is not efficient, that has high emissions, because definitely this is a way to ruin a biomass heating market, because it is not good for your health and it's also not good for the sustainability of the market development. So to have tight emission and efficiency standards for biomass heating system is a core element of any renewable heating policy for a country or a state to ensure that biomass heating is healthy and not only good for the environment but also good for the health of the user.

In the U.S. heating with biomass is often perceived to be too expensive to be competitive with natural gas or heating oil. How have you been able to overcome that perception?

I think it is important when you look at the heating system to look at the lifecycle costs. So to look what are the costs over the lifetime of this appliance and these costs consist of course on the one hand of the investment costs for the appliance and the fuel costs. And when comparing different heating systems it is important to compare life cycle costs of different installations of the oil heating system, for example, and an automatic pellet heating system. We find that, and the oil prices in Europe are still lower than they are in

the U.S. at the moment, that over the lifetime of a heating system, a pellet heating system can easily compete with an oil heating system, because the investment costs are about a third higher, but the fuel costs over the lifetime are 50 % lower than for heating oil and we are still at the moment not at the peak of the oil prices but in a medium level. So it's important to compare lifecycle costs and to compare investments and fuel costs. So that is one element, the second element about the tambourine is that the people do understand that it makes a difference for their society, for their country, whether they use fossil fuel which are imported from far away countries where there is no profit to anyone in the country, except a tiny little bit for importing and distributing fossil fuels, or whether they are using a local fuel which is not only better from in terms of transport, but which is also a lot more secure. So energy independence is a very important argument for consumers, because they understand that importing fossil fuels may not always be secure in the future, but having local biomass gives them the assurance that the fuel will be available for the next 10 or 20 years.

Thank you, Christiane. Further information on Christiane Egger and the Austrian biomass strategy can be found at www.oec.at/en. More resources, including interviews and archived webinars on the biomass industry are available on the BTEC website at www.biomassthermal.org. Thank you so much for listening.