BRATISLAVA INTERNATIONAL SCHOOL OF LIBERAL ARTS

The design ethics of electric composters according to Borgmann's device paradigm and focal things and practices.

Bachelor Thesis

Bratislava 2018 **Haniah Závodská**

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Declaration of Originality

I declare that this bachelor thesis is my own work and has not been published in part or in whole elsewhere. All used literature and other sources are attributed and cited in references.

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Haniah Závodská

Signed:.....

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Abstract

The main idea of this study is to analyze design ethics of composting machines. Albert Borgmann is an American philosopher, with the main aim on philosophy of technology. In his book Technology and the Character of Contemporary Life, Borgmann talks about the limitations of technology. Borgmann focuses on replacement of classical cultural habits of people to modern technology. In Borgmann's language, focal things and practices were replaced by device paradigm. Contact with daily activities changed and slowly disappeared. People use machines and technology tools in everyday lives, instead of doing things by themselves without any care of nature. Today's world is about pushing a button and observing how the thing is done by the machine. Just a few hundred years ago, there had to be hours of manual work done by people to achieve the same result as nowadays by pushing a button. Composting machines are an example of technology, about which people have to care, because it is helping environment. On one hand it is automatic machine, where only a button has to be pushed – device paradigm, but on the other hand it is necessary to care precisely for the machine, and also the machine is cultivating care – focal things and practices. Some devices might restrict connection between people and nature, but at the end they are more beneficial for the environment.

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Abstrakt

Hlavnou myšlienkou tejto štúdie je analyzovať etický návrh elektrických kompostérov. Albert Borgmann je americký filozof s hlavným zameraním na filozofiu technológie. Vo svojej knihe Technológia a charakter súčasného života, Borgmann hovorí o obmedzeniach technológií. Borgmann sa zameriava na nahradenie klasických kultúrnych návykov ľudí modernou technológiou. Podľa Borgmanna boli nahradené "praktické postupy" modelom "paradigma zariadenia". Kontakt s každodennými aktivitami sa zmenil a pomaly sa vytráca. Ľudia používajú stroje a technologické nástroje v každodennom živote, bez akejkoľvek starostlivosti o prírodu namiesto toho, aby robili veci vlastnoručne. Dnešný svet je o stlačení tlačidla a o tom, ako to urobí stroj namiesto ľudí. Len pred niekoľkými stovkami rokov ľudia vykonávali hodiny manuálnej práce, aby dosiahli rovnaký výsledok ako v dnešnej dobe stlačením tlačidla. Kompostovacie stroje sú skvelým príkladom technológie, o ktorú sa ľudia musia starať, pretože je založená na biologickom živote. Na jednej strane je to automatický stroj, v ktorom je potrebné stlačiť tlačidlo –paradigma zariadenia, ale na druhej strane je potrebné postarať sa o žijúce organizmy v kompostéri – praktické postupy.

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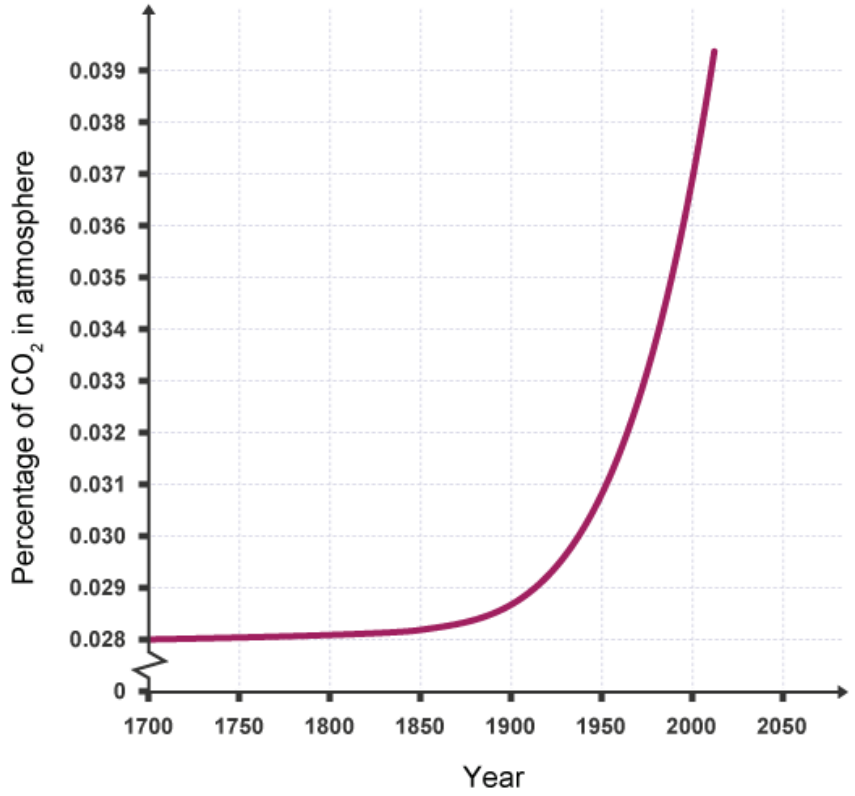
Introduction

Nature has its own, still evolving system, which was working and functioning without people's presence and without any human intervention into it. In other words, the Earth does not need humans. However, there is no such an animal species which influences Earth as much as people. People have power over the nature. Human activity on the Earth affects almost every part over the nature, on the earth, under the earth and in the atmosphere. As everything is related to everything, every human intervention in nature somehow reflects the human's activity. We can already see devastating consequences of human activity in, for example, releasing emissions into the air and creating ozone hole, excessive mining and quarrying of natural resources which destroy whole ecosystems, deforestation, and massive waste production ending in the ocean and on landfill. As Steffen says: "*Taken together, these trends are strong evidence that humankind, our own species, has become so large and active that it now rivals some of the great forces of nature in its impact on the functioning on the Earth system."* (W. Steffen, 2011)

Since people have reached one of the highest points of evolution, meaning that creativity and ingenuity of people have improved, the environment began to feel the burden that people have created. The problem started to be visible, and very serious in the previous century, when the biggest technological and industrial boom began. The question is only when the official start of this period, called the Anthropocene might be.

For Steffen, The Anthropocene has started only lately in 1950s and 1960s with great acceleration and progress of Industrial Revolution, which went before the great acceleration, but the acceleration was interrupted by two World Wars. However, for the purpose of this bachelor thesis, the beginning of The Anthropocene will be recognized as the start of the industrial revolution in 1760s, starting mainly in Britain. It is this time that leads into: "*The Industrial Revolution, with its origins in Great Britain in the 1760, or the thermos – industrial revolution of nineteenth century Western civilization marked the end of agriculture as the most dominant human activity and set the species on a far different trajectory from the one established during most of the Holocene" (Wellcome to the Anthropocene)*

One of the major results of the industrial revolution was seen in increasing amount of carbon dioxide in the atmosphere. *"For example, atmospheric CO2 concentration was 277 ppm (by volume) in 1750, 279 ppm ion 1775, 283 ppm in 1800 and 284 ppm in 1825, all of which the range of Holocene variability of 2690 – 285 ppm."* (W. Steffen, 2011) Concentration of carbon dioxide in the air is by the time still raising and it represents the biggest environmental problem so far. In the last measurement concentration of carbon dioxide in the atmosphere reached 406,58 ppm. The figures are showing that the rise of the carbon dioxide in the atmosphere is clear indicator that the Anthropocene arrived in 1760s. (For latest results see appendix C.) Rise of the carbon dioxide in the atmosphere is not something that shows up from the day to day. From 1700s it has accumulated in the air, until it started to be recorded. Later on in the 1900s, carbon dioxide rise and indicate that the end of agriculture as the most dominant human activity stopped, and was replaced by purely technological devices.



The Borgmann's concept of device paradigm, which will be discussed later, also depends on Industrial Revolution and whole technological boom, because it shows how the care of the nature due to the technology disappeared. For example, farmers began to be able to produce much more wheat, due to the agricultural machines, which speeded up the whole process of the cultivation of grain. On one hand, such technology has brought more production opportunities, but on the other hand it has caused loss of the care about the product itself, but about the quantity of the product. The quality of the product is related to the care of farmer toward the product. However, production and cultivation began to be a matter of quantity not quality. Borgmann´s categories, device paradigm and focal things and practices, touch the problem of losing cultivation of the care of people towards the nature. Technology, or in his words device paradigm replaced manual work, focus and care of things, as his focal things and practices explain.

The word technology comes from the word *techne*, which means art, technique, or craft and logos, which means word, law or even language. Technology as such is understood as human activity based on empirics. The processes of technology are being used through exact technique for different human needs. The processes of technology are being used through exact technique for different human needs. Technology mainly simplifies human work. For example, communication between people has been mostly replaced by use of telephones, which are technique to a human need which is communication. Technology is a major progress and step forward for humanity, with many advantages. People no longer have to spend time by, for example, heating a room, or taking care of the warmth. Many steps were replaced by only one step, for example, the pushing of a button.

In the current situation, in Slovakia, interviewed people from the industry, which deals with the waste and technology for reducing the waste, agreed on fact that people should care more about environment and nature, even though technology creates important part of people's lives. For example, CEO of waste management company, Peter Krasnec answered the question whether people should care about the environment following: "*Certainly yes. The care of environment, in my point of view, is one of the most important tasks of humanity. If we irretrievably pollute the environment, we can endanger the life of not only humanity, on our planet."* Technology as such is simplifying work, which is on one hand efficient. On the other hand by simplifying and accelerating things, people to stop thinking about consequences technology brings. Technology is used to make things easier, without any care of the nature, or without people thinking what the use of certain technology can cause. Manual work was changed by pushing the button, what caused that people to stop thinking about various things. For example, people stopped thinking about the device as such, how it was designed, what it actually does, and what are the consequences of the device. Also technology that simplifies people's activities caused that people do not care about the environment and nature.

Case study of this bachelor thesis seeks to determine if, one such technological device for environmental concerns, composting machines, cultivates care of humans towards the nature. Design ethics of these machines will be discussed according to Borgmann's theories of device paradigm and focal things and practices. Electric composters were taken as an example, because of its ability to reduce waste and carbon dioxide emissions. The waste would otherwise end up on the landfills, where it will by rotting exhale carbon dioxide into the air.

Chapter one: The Anthropocene

The term the Anthropocene explains the Earth's newest geologic time period. Geological epoch, called the Holocene, which started around 10,000 years ago and during which humans have evolved and the Earth was relatively stable, ends in 17th century. This epoch is called the Holocene and it has been replaced by the Anthropocene. During the Holocene geological epoch several phenomena occurred. For example, movement of the tectonic plates diminished, climate was stable with no big fluctuations and fauna and flora have not evolved much etc. However the sea level rose a little after post-glacial rebound, yet it can be said that the Holocene was a calm geological epoch. At the end of this epoch, human era began, the Anthropocene begun. As Hans Jonas puts it: "*After the first-degree power directed at a seemingly inexhaustible nature, has changed into a second-degree power which wrested control of the first from the user's hands, it is now up to a third-degree power to enforce the self-limitation of the rule that carries along the ruler, before it shatters on the barriers of nature."* (Jonas, 1984)

The biggest feature of the Anthropocene is the influence of the human race to nature. It can be explained as the period of geological time, which was created by human activity. As it is claimed *"Anthropocene is based on overwhelming global evidence that atmospheric, geologic, hydrologic, biospheric and other earth system processes are now altered by humans. […] The Anthropocene is distinguished as a new period either after or within the Holocene, the current epoch, which began approximately 10,000 years ago (about 8000 BC) with the end of the last glacial period."* (Wellcome to the Anthropocene) Human activities in the last two centuries are finally reflecting on the environment and nature around us. Technological and industrial progress has brought an amazing improvement and new possibilities for people. Traveling and transportation of goods and material have become faster, mining and building have become easier, medicine progressed, communication has taken on new dimensions, and many more other field recorded a great step forward.

On the other hand, all of these were focused only on progress in technology, not nature and consequences that it will have to face. Nature has not been taken into account at all. Serious environmental issues appeared in global sense, such as climate change, melting ice, rising sea levels, bigger ozone hole, the extinction of certain animal species, and decreasing amount of natural resources, such as oil, or even water. One of the biggest signs that the Anthropocene has arrived is mainly visible rise of carbon dioxide in the air.

The Anthropocene as a new epoch created by human activity is important field to study and extend, if life on Earth wants to be returned to normal condition. If the importance of the Anthropocene is ignored, it will not take long until the environment becomes so devastated, that the Earth will be no longer habitable for people. In the case of an excessive pollution, deforestation and extraction of natural sources human race will come to the end of its existence. In the worst scenario air might become unbreathable, and water undrinkable. If these two, the most important and most needed factors will be violated, human race will have without a doubt hard time with surviving.

In particular, when fossil fuels were discovered as a source of energy for industrial production, human activity towards the nature rose rapidly. "*The result of these and other energy – dependent processes and activities was significant increase in the human enterprise and its imprint on the environment."* (W. Steffen, 2011) This discovery of fossil fuels, such as oil or coal, mark the beginning of the Anthropocene, and also beginning of the first and second degrees of power that Jonas is talking about in his book.

The discovery of these fossil fuels, such as coal mark beginning of the Anthropocene, and also the start of Jonas theories of second and third degree power. "*This third degree means power over the second- degree power, which was no longer man's but power's itself to dictate its use to its supposed owner, to make of him the compulsive executor of his capacity, thus enslaving man instead of liberating him."* (Jonas, 1984) Jonas is firstly focusing on the relationship between humans and nature in the sense of comparison of today's man and antic man. First big intervention of the antic man towards the nature was creation of the city, but it had not such an impact on the nature. It was the first step of progress that humanity, not only in the political or moral way, but especially in the field of technology and ethics. Jonas claims that man is over the nature, and always was, with only one difference. There is also a challenge that at the time of the antiquity the man was still tolerant and the nature was just keen to control. Antic man did not damaged the nature nevertheless was using it for his needs.

Human race never had to care about what impact he or she has towards nature, because the nature interventions have been minimal. Man was simply not so powerful over the nature that he had to think about the consequences of his actions. In the past, technology and progress have served humanity as needed and short-term actual goals. For example, the roofs, under which people sleep. It was made by people and with care. But there is a difference in the assumption of ethics. While in the past has been about presence, today ethics is focused on the future and collective responsibility.

In the past, the nature was too unpredictable and powerful, so the people were not able to have power over it. Over time, it has changed. People have gained power over nature. Jonas is trying to find for the duty of mankind, instructions on how to proceed. Therefore, it is urgent to find a way to morally advance the technical progress. Anthropocentric ethics has never forced us to think about whether or not nature has any moral claim to us. Jonas is focusing on the responsibility of humans not only towards the nature, but also towards the next generations. The power people have taken over the nature due to the technology lately causes massive climate changes and the responsibility of people increases.

Third degree power literally means gaining power over power, power over the human powers over the powers of nature. The technological progress of today's world gained power over the human race, which has power over the nature. Technological progress is moving forward rapidly that even their creators, humans, cannot stop it. Technology means to create devices which are restricting relationship between man and nature. Technology is replacing real human care of nature by pushing the button and not caring at all. That is the biggest limit of technology for Borgmann.

As Hans Jonas in his book called The Imperative of Responsibility argues, humans have no power over the nature, but yet people act like it. People are fully responsible of destroying Earth, what is in some point ironic, because they need Earth and nature for their own living. Jonas claims that: *"The power has become self-acting, while its promise has turned into threat, its prospect of salvation into apocalypse. Power over the power is required now before the halt is called by catastrophe itself the power to overcome that impotence over against the self-feeding compulsion of power to its progressive exercise."* (Jonas, 1984)

The Anthropocene, as the new epoch, which brings into people's life new possibilities in the form of technology, brings also the question whether technology limits cultivating of care in human lives towards the nature. That is discussed later, with Borgmann's theories and the design ethics of electric composters. The biggest sign of the start of the Anthropocene is a visible increase in carbon dioxide in the air. The same substance which is in large amounts released into the air from the landfills where waste is collected. This certain issue will be also discussed later.

Relationship between nature and humans

Interaction between humans and nature means that they are in certain relationship. History shows us that we belong to nature and that the environment is something that affects us and we affect it. The human activity and interference of human towards nature has been here since the beginning of human era for millions of years. Fulfilling basic living needs, such as hunting or harvesting, or swimming in the lake on the purpose of cleaning up are activities so little and natural that environment can easily handle it without humans hurting it. There is no evidence of human race harming the planet with any consequences.

Industrial Revolution time ripped open a bag of ideas mainly in industries, science, and technology as such. Activities which people did by themselves were replaced by the technology which did it instead of them. Now, everything what earth gave to people starts to be misused and environment is starting to suffer. People are using washing machines which is wasting a lot of water and using many chemicals that leach into the nature. Also the production of waste, at industrial, commercial, and individual levels, increased so much that landfills started to be created. These landfills produce carbon dioxide emissions. Inside of the landfill body many processes and changes are taking place, such as releasing of gases, for example, methane and carbon dioxide. Released landfill gases have a negative impact on the surroundings of the landfill, and because of the air flow, pollutants can reach even greater distances.

However, there is still a chance that technology as such does not have to pose a danger. It is important to study the design ethics of devices. Borgmann gives us categories by which we can assess these designs. Borgmann argues with his category of device paradigm that technology erases care and interest of the environment and the nature. Jonas argues that human´s power over power of the nature is being replaced by technology power over humans. Landfills contribute into the increasing carbon dioxide emissions. The design ethics of the modern technology needs to be improved to cultivate care of people towards the nature and the environment.

Landfills

Simple definition of landfills is that it is the place where things, mainly waste, are being collected. It is one way of collecting and reducing waste which is very common in Slovakia. Although there is much legislation about landfills, and government is trying to make them safe for the environment by doing certain steps, there are many risks. For example, intensive chemical processes are taking place in the landfill. These processes release gases of different chemicals into the air. These released landfill gases have a negative impact on the surroundings, because it can travels far due to the air flow. Some gases, such as methane and carbon dioxide, make a significant contribution to creating a greenhouse effect and changing the earth's climate.

Harmonization of European land cover databases for the creation of value added services defined landfills as: *"Landfilling is currently the most used way of disposing of waste. Landfills represent the last article in the waste disposal chain in the waste management system. It is a device that serves for the final disposal of waste taking into account hygienic, geological and environmental aspects so as to avoid environmental hazards. As of 2009, 136 landfills were operated in Slovakia."* (HLanData) Every legal landfill is a place which must have a machine for disposal of waste. Waste on landfills is then embedded into the ground or onto the ground. Landfill is only there, where the waste is being processed not stored. Waste on the landfill has to be processed or reduced by the machine. So it is because landfills are mainly supposed to be intermediate stop between households and processing the waste, for example, by the machine. Mentioned number is the number from the databases of legal landfills. Illegal ones were never counted, because many of them are hidden.

The correct landfill in accordance with the law should be not harmful for the environment. These landfills are following certain rules, which secure cleanness. Minimization and optimization of landfills secure smaller odor and dust emissions, smaller amount of wind-fed waste, smaller noise and traffic, protection of birds, insects and other animals, fire protection. The people or these small companies simply take their waste and throw it on random place in the nature. This is the sign of losing care about the nature. People are supporting illegal landfills by themselves without caring about consequences it can cause to the nature. Unknowingly but directly they destroy their own homes. People and nature come into contact every day. However, the care people used to have towards nature is disappearing up to the point that people do not even care about their own places where they live.

According to the fact that every legal landfill must have a machine for disposal of waste a solution in the form of electric composters appears. These electric composter, discussed and explained later on, are able to reduce biological waste up to 90% so the amount of landfills after processing the waste will end up on the minimum. By using electric composting machines, the waste which ends up on landfills will be reduced. The outcome would be that the amount of carbon dioxide, which is released from landfills, will decrease. If the machine is design in the way that people do not have to think about it and it is enough when they push the button, then the technology is not ethically design according to the Borgmann, because it is not cultivating the care. Electric composters according to three later mentioned examples fulfill the Borgmann´s categories. What's more, these machines were not design only for particular place, building, industry, or for example landfill. These electronic composters can be located anywhere, where the place meets the conditions that will be specified later.

The aim of this bachelor thesis is to argue that the electric composters are ethically designed according to the Borgmann's categories. It might be not fully in alignment with focal things and practices, but due to the three aspects on which will be focused later, the electric composters still cultivate care. Even though the electric composters are closer to the Borgmann´s category of device paradigm, they help people bring focus and attention of their actions and interest of the environment and the nature.

Waste on the landfills is created by rotting and decomposition carbon dioxide emissions, which then contribute to climate change. Electric composters are ethically designed machines, providing reduction of the waste on landfills and in the final result, also reduction of carbon dioxide emissions. These electric devices are progress, which at the same time helps people cultivate care of the environment. Electric composters are able to reduce waste on landfills, which means space utilization, limitation of overall air pollution, and creation of final product which has further use. The goal of the implementation of the electric composters might be absolute reduction of the landfills at the minimum.

Chapter two: Electric Composters

According to the new regulation for Slovakia from 2017 towns and villages must establish separate collection of biological waste (for details, see appendix A). That means that biological and waste cannot be collected with municipal waste. It is simply because municipal waste usually ends up on landfills. Food (kitchen) waste does not degrade but rot. By rotting it is understood that biological waste will compost itself due to the external influences. Also the process of rotting, is slower than process of composting. It is so, because the electric composter has the ability to mix the waste, aerated it, and also stabilize the temperature. By degrade is understood that non biological waste will eventually decompose itself into the smaller and smaller fractions. Degrading and rotting attracts pests such as rodents, or other animals. And what's more, rotting food (kitchen) waste releases substances polluting the environment. If the waste will not be processed it will be taken to legal or illegal landfills where it will rot and degrade and cause pollution. After setting a regulations there is still serious problem with applying it. Towns and villages do not have budget and infrastructure for machines that will process the waste. In other words, law is faster than implementation by statuaries (mayors). This drives people back to the illegal landfills. The waste which should be processed end up on landfills, because even though there are certain regulations, Slovakia is still missing application of these regulations in to practice.

Electric composters are technological devices, which were created on the purpose of protecting the environment and the nature. The design of these machines is ethical, because there is zero pollution of air, land, or water. The waste which would end up on the landfill and which will pollute the air goes into the machine, which reduced and composted the waste and filtrated gas. These electric devices are supposed to make reducing of the waste better, while they are saving the environment and the nature. Electric composters are devices constructed to reduce food (kitchen) waste. These machines are able to reduce waste by 90% of all embedded food (kitchen) waste. After composting process an unadulterated and certified substrate (compost) is created.

The focus here will be on GreenGood composters. "*GreenGood is an innovative technology to allow waste from being processed on location, in restaurants, hotels, schools, supermarkets, etc." (Dekos R)* There are seven basic types of composting machines (for details, see appendix B). Each composting machine is working on the same basis; the only difference is in the size, technical specification and the volume of the waste reduction in kilos, which can change between two and five hundred tons per year.

Location of the electric composter

While the restaurant, hotel or town decides to have a composter, the right place has to be chosen. The electric composter needs to be under the roof, so it does not rain on it, or in does not freeze. The electric composter must be placed on the stable floor. Also it needs access out, so it can drain filtered air.

There are several steps and rules which have to be kept, while instilling the electric composter. User needs to reckon with the fact that the lightest electric composter weights about 25 kilos. It is recommended to move the electric composters by more people. Heavier machines have wheels, but it is still recommended to be moved by more than one person. It is important for the machine to be installed inside of the building. By that user will avoid two possibilities for the electric composter to be damaged. First reason why the machine has to be in the interior is possibility of rain. The electric composter cannot get wet. Second reason why the machine has to be in the interior is temperature. The electric composter cannot be placed somewhere were temperature drops under the zero degrees.

The electric composter has to be installed on the stable floor so that does not shake while using. The room has to be well ventilated and with the access outside. The electric composter needs little bit more space around so the operation, manipulation and use of the composter are easy.

Next step while placing the electric composter is installing the exhaust hose. The exhaust hose cannot be bend while manipulation with it. It is because the exhaust hose might get damaged and also because the air, or steam which comes out can condensate and return back to the composter as water. The exhaust hose should be faced towards the ground to prevent it from anything that can fall inside.

As follows the device is plugged into electricity, heated to the minimum 40 degrees and filled with microorganisms. After this, the electric composter can be fully used. Food (kitchen) waste can be put inside, so that it does not exceed maximum, which is indicated by mark inside of the composter.

Composting Process

Once is composter plugged in, and a filter is installed a starting dose of microorganisms is delivered, without which the composting process cannot start. This step is not repeated, because microorganisms continue living inside the composter for many years, if the user respects operating rules.

At the end of the day, when restaurant or hotel closed, trained employee takes produced food (kitchen) waste and put it into the electric composter. This step is repeated from five to ten days, depending on the type of the machine, until the composting machine is filled up. The first dose of waste is composed and reduced in twenty four hours. The employee chosen to use the electric composter is trained by a professional who works with these machines. This professional explains and teaches everything that is necessary for the user to know about the machine.

The first important step in training of the user of the composter by the professional is safety and health at work (BOZP). It means learning basic manipulations of the machine, and dealing with critical moments in case of failure. The next step is about filling the machine with the food (kitchen) waste. It is important to know how much can be insert in, and also what type of the waste. The amount depends on the technical specifications of the type of the composter. The quantity comes out of the composer's name, (corresponding number, for example GG-02 to 500). The number in the name of the electric composter significates tons per year, which can be composted. After that process of the hygienization follows. This process is about acquisition temperature of the 70 degrees. Due to the high temperature all pathogens are killed. After all of this compost is made and can be removed. While it is removed, it is warm and needs to rest in the open bin.

It is necessary to mention the general principle of composting and that is humidity. The electric composters are equipped with a moisture meter, which means that the program or the control unit can determine whether heat or not to heat it. That is why the composting machine has a program with which it can save energy at low humidity, while the material/ waste is already composted. It is important to water over dried material in the composting machine. If the waste is too humid or wet, the composting process is prolonged and the composting process has to be supported by dry materials (pastry etc.). If it is too dry, water, soup or other liquids are usually poured into the composting machine. It is easy to find out what the material inside the composter looks like, only according to waste which is put inside, or by looking inside the composter through the door. The addition of wet or dry materials accelerates the composting process, saves money for energy, and promotes the life of the composting machine.

Another aspect is mixing. For this purpose, the device is fitted, or inside the device there is a shaft on which the blades are anchored and the program of the device (the control unit) monitors the stirring system. All components include blades, engine, chain and heater rods, are made of high quality materials and stainless steel. The inner stainless steel tub is sufficiently coarse and rigid to withstand friction when it is agitated to withstand the mass of the mass in the compost. This system converts bio mass, microorganisms and subsequent compost into the certain algorithm.

Mixing goes a few minutes in one direction, a few minutes in the other direction and a few minutes in a stable position. This program also works when you turn on the "hygiene" program. The hygiene program will raise the temperature to 70 ° C – (Regulation 1069/2009) when the compost will become unadulterated at 70 degrees or more for one hour, when all germs, pathogens, and so on are removed. The resulting product is compost which has to be mixed with the usual form prior to use (fertilization), hence neutralizing it, but the resulting compost from the compost is no longer harmless. – add more info about compost

Once the composter machine is full and machine needs to be empty, trained employee pushes the button for hygienization process. After this hygienization process starts, no one can touch the machine for hour and half, until the process is done. When it is done, pure certified compost without any bacteria and in smaller amount then waste, is pulled out up to the mark. Certification of the compost is given by Central Agricultural Control and Testing Institute (UKSUP). Certification of compost means that due to the whole heating and composting process inside of composter, product that comes out is without any bacteria and it is full of nutrition.

Some of the compost (starting dose of microorganisms) has to stay in composter, because on that basis another composting process can start. Selected compost is warm, so it has to rest for a while in the open bins. Then the compost can be used as fertilization, gardening, or any other land changes, but it has to be mixed with soil. Otherwise it will burn the plants. This is usually mixed in proportion 1:10. (Dekos R)

Microorganisms

The microorganisms live and they need certain care of the user of the composting machine. These thermophilic microorganisms are bred especially for processing the food (kitchen) waste within 24 hours. The microorganisms need optimal conditions to work properly. Minimal needed temperature is 40°C, but the microorganisms can handle also 100°C. Already at 40°C microorganisms can multiply and break up the food (kitchen) waste into small fractions. In simplicity, the microorganisms eat the food (kitchen) waste, digest it, and exclude.

These microorganisms do not necessarily need intensive care, but still the user of the composting machine has to be careful, because there is possibility of drowning, or drying the microorganisms while adding water, or not adding water inside of composter. User of the composting machine needs to know the machine, needs to know what he is putting inside it, and also needs to know what he gets out of it. All is in the connection to the microorganism and their order to live and compost.

The organisms inside of the composting machine, which are helping composting process, are living organisms. It means they need certain thing to live, so the users have to take care of them. For heating the machine heat rods are used. They secure the circulation of the oil that is heated to a certain temperature in order to get the optimum heat in the machine. The most important aspect is the access of air, which is sucked in and subsequently expelled from out of the device, through the filter out. Air access is indispensable for microorganisms to aerobic fermentation. Aerobic fermentation means that these microorganisms as another living organisms need air to reproduce and to decompose substances. In translation aerobic, mean access of the air, and fermentation is decomposition of substances.

Chapter three: Focal things and practices vs. device paradigm

At the beginning of the book, Technology and character of contemporary life, Borgmann is dealing with his category of the device paradigm. He is trying to understand technology in terms of devices. It simply means that the way how machine or device works is affecting our life probably more than it should, and probably more then we realize. Unknown can be understood to the way machines works. For example, phone or computer user, use it only for what they need and not for everything what machine can do and what the machine offers. Also when the device breaks, user has no idea how to repair the thing. There has to be some sort of specialist focused rather on computers, phones or any other electronic device called, who will solve the problem. The device paradigm is a simplification of activities people do every day, but also as losing the connection with nature.

Borgmann's other category is focal things and practices. More ideally it cares about environment. To care means to really do the things. To go and cut the wood, to scratch stones and make fire is to care. Prior to modern technology, people had to care about things they were doing, for example, because if they will not pay attention while cutting the wood, they might cut their finger off. People had to focus on their activities, because they were doing it manually. Now people do not care about anything when they push the button, because the machine does all work without them. As Borgmann says about modern technolog: *"Something is avaible in this sense if it has been rendered instantaneous, ubiquitous, safe and easy."* (Borgmann, 1984)

His statement is not that technology is inherently bad or harmful to humans. His point is that we do not care for the things at hand when technology is based on the device paradigm, breaking the relationship between people and nature. Borgmann offers the example of warmth, which very gently explains his idea of the device paradigm. By only one button being pushed, or by turning the heather heats. People lose the contact with the nature, by easing daily activities. For example, hundred years ago, several steps had to be taken, before the day even started. The trees had to be chopped, the wood had to be cut, and the fireplace had to be prepared. People also had to take care of the fire otherwise it will extinguish. It is real connection with nature, because

people had to go by themselves to the forest and do the thing. No machine did that instead of them.

For the design ethics or ethical design of the machine to fall under the category of focal things and practices, the ability of the machine to cultivate care of people towards nature or about the machine itself must be taken into account. For the design ethics or ethical design of the machine is considered ability of the machine to cultivate care of people towards nature or about the machine itself. After the massive boom of technology following the Industrial Revolution, the human race quickly jumped into the new epoch, the Anthropocene. A number of novelties in the technology industry have brought people new possibilities how to improve their lives. Technology as such accelerated processes of production, simplified people's life, and even brought entertainment. Continuing lust of going ahead and inventing of the humans caused lack of interest of the nature, environment and design ethics of technology that have been invented. Manufacturing was replaced by technology and care was replaced by disinterest. In other words, setting the fire was changed to pushing a button. While people's ancestors had to go into the forest for the wood to not freeze during the night, nowadays people have it easier. By pushing a button, the heating system heats up the room instead of the people doing it manually.

Indeed, composters are great example of merging Borgmann's two categories. Technology does not have to necessarily present as danger. If the machine is well designed and it cultivates the care of people towards the nature and environment, then the technology might be beneficial for human race and nature. The device paradigm represents a possible risk of losing care of nature and environment. Modern technology is designed to be very complex, yet the developers try to get the use of it as simple as possible. For example, electric composters seem to be complex technological devices where pushing the button and not caring is spotted according Borgmann. However, electric composters are a little bit different kind of technology.

Design Ethics

Borgmann explains that science tells us about the world as it actually is, while technology allows us to transform it into other possible worlds. Science is knowledge. Science is theory proven by experimental practice. It is something what is only enriching, neither hurting nor limiting humans nor nature. Technology, on the other side, is giving us completely new view how to live. The problem, he studies is returning to the limits of technology and the fact that technology affects nature.

Every device needs certain care, but usually the user of the device does not know much about it so the broken device has to be taken to a specialist. That means that people do not really need to care, how the device works. Composter is the device, which requires care from its user. It is mainly because of the living organisms inside, but also because of the natural product which is inserted and also picked out. Another example of the care which is cultivated in humans due to the composters is the fact that it has to be properly placed, for example, inside of the building. In one way, the whole composting process and electronic composting machines are more relatable to the device paradigm. This paradigm stands for loosing care of nature from the people's side. And yet the composters cultivate care. Borgmann claims that technology and progress as such is not a bad thing, but that it disrupts people's contact and relationship with nature. On the other hand, because composting machines are saving and protecting the environment, because they are reducing waste, which would rot and pollute somewhere in landfills or municipal waste collecting yards, it is also keeping the relationship and care between people and nature.

Electric composters are technological devices. However, partly because they have biological basis, they are somewhere in between the device paradigm and the focal things and practices. It is still a machine, modern technology, but it is not operated only by pushing the button. Firstly, the machine cannot be operated by anybody. The person has to be trained. Being trained is the first sign of caring, because there is necessity of knowing the machine properly. It is not only about pushing the button, electric composter has to be manually filled, manually put out and also the program has to be set according to what is inside of the composter. The actual design of the electric composters forces the user to focus and care of the machine and also the environment and the nature. That design of the machine is building the relationship between the user and the electric composter, because it is necessary to care about things. While wisely choosing the right place for the machine user has to count with several circumstances.

Installation of the electronic composter is a process that requires attention, focus, and care. The location of the electric composter is important. It is a heavy machine so it is recommended for the user to move it also with another person. The electric composter has to be placed on the stable floor, and in the interior, so it does not rain on it. There has to be enough space around the machine, so manipulation is not blocked and it is easy to open the lid and put the waste inside it. Another important aspect is exhaust hose. It has to be manipulated with the exhaust hose carefully, so it is not damaged. This exhaust hose has to face the floor, to protect it before things that might fall inside and block it.

Thirdly, the whole composting process depends on living microorganisms. These living microorganisms require and need appropriate conditions to survive and to make the composting process right, so the trained user had to pay attention, focus and take care of them. Living microorganisms need air, moisture and food. Living microorganisms are direct connection of technology and nature. Due to these living microorganisms the user of the machine is cultivating care towards nature. The user is providing all needs to those microorganisms so they do not die, and they process the waste correctly. There are few risks that must be avoided, such as the drowning, drying or choking of the microorganism, in case of inappropriate and careless use of the composer. The machine is designed to create excellent living conditions for these

microorganisms. The machine creates great environment for the microorganisms by cultivating care of humans towards the machine and nature.

Even though there has been, for example, great climate change after industrial revolution and raised of carbon dioxide emissions, modern technology brings the opportunity to correct the mistakes of mankind or to at least alleviate any interference with nature by cultivating care of mankind towards nature. Interviewed people from the industry claim that there is definitely new and modern technology which is cultivating care: ,,*There are many technologies that protect the environment. E.g. filters on chimneys that capture exhaust emissions into the air, waste recycling technologies, waste water treatment plants, economical engines on cars (as well as electric cars), and the like. All such technologies help protect the environment. (Peter Krasnec)* Mentioned technologies, which at the first sign protect the environment and nature, are great examples for Borgmann's device paradigm. These technologies are not cultivating care at all, they function almost without any human intervention.

Jonas's book explains how people are responsible of everything what is happening now with nature and how is ethics important. People should be familiar with this responsibility, as far as their homes are concerned, and ultimately also in their lives. It is ironical that humans are not having control over the third-degree power. That indicates how everything is connected and how we are thus responsible for those connections. It is claimed by Jonas that: *"We need an ethics of the state of crisis, an ethics of responsibility, of conservation, of preservation. Traditional ethics, which govern relationships among human beings, can no longer inform us on the norms of "good" and "evil" to which we must submit."* (Jonas, 1984)

Most of the modern technology is not cultivating care, but due to progress people started to make technology which is caring of environment in the sense of the focal things and practices, such as electric composters, which are an example of such technology. The design of these electric composters is ethical, because it is based on the three important examples. These examples are cultivating care of people towards the nature, because they keep user of the electric composter focusing on the process form the beginning until the end. The electric composters are rare example of modern technology, which encourages human race in taking responsibility for the connectedness of everything, as can be seen through the lens of the machine's design cultivating care.

Conclusion

The care of the nature is necessary. People need to care about their environment. There are several reasons why so. For example, people need nature for their life. They need its resources from simple things as food, up to technological devices which are made of metals etc. There is no way people would survive without nature. But the empty package will not fill itself again. People cannot only take from nature without giving it something back. Caring of the nature and providing better and better inventions, which will secure protection of the environment.

It is probably too late to try to save, what is already damaged. But it definitely is not too late to protect what is not damaged yet. The technology which protects nature and the environment is a great start. Protecting, means caring. In today's advanced times people come up with many great ideas of technology, which protects environment and keeps people in touch with the nature. Of course, there are types of the technology, which does not pollute nature and the environment, but still does not cultivate care. For example, chimney filters reduce pollution which goes into the air, but once these filters are installed into the houses, they do not need any special care from people. They work independently.

Albert Borgmann defines device paradigm as some sort of simplification of activities people do every day, but also as losing the connection with nature. Technology is meant to enrich and simplify lives of the people, more ideally it is also supposed to care about environment. To care means to really do the things. To go and cut the wood, to scratch stones and make fire is to care. People do not care about anything when they push the button. Borgmann offers an example of warmth, which very gently explains his idea of device paradigm. By only one button being pushed, or by turning the wheel the light is on, the heather heats. People lose the contact with the nature, by easing daily activities

Focal things and practices are about caring, focusing, and practicing things. While now, the heater does the work for people, in the previous centuries people had to do the job by themselves. Borgmann´s aim is to keep people connected to nature, which cannot be done if machines do the work instead of them. Focus, as Borgmann claims, has many interpretations in many languages and according to many people. But one is for sure, focus means hearth. Hearth just by its sound shows connection between people and nature.

According to Borgman's theories of device paradigm and focal things and practices, the composters, are somewhere in between. The machine has to be operated by the trained person. Being trained is the first sign of caring, because there is a necessity of knowing the machine properly. It is not only about pushing the button, an electric composter has to be manually filled, manually put out and also the program has to be set according to what is inside of the composter. Electric composters achieved the goal of cultivating care due to three examples. Firstly, the importance of the placement of the composter, because the place has to be wisely chosen. The best place for the composter is inside of the building with possibility to extract filtered air outside. Second example for cultivation of the care of the composter is training of the employee and/or user by the professional. This professional encourages users to be interested in the composter and the care of it. The living microorganisms inside of composters cultivate care too. User is creating the best conditions for life.

In many cases compostable waste ends up on the landfills. There are two types of the landfills. One type is legal landfill, which due to the regulations and laws, protects environment from pollution. There are several steps and rules, which has to be followed, so the landfill is safe. Second type is illegal landfill. These landfills are mostly created by small companies, but also people. Because of the human laziness, disinterest, people do not care about the environment and the nature., not even surrounding their own homes. The creation of illegal landfills is causing number of problems such as water pollution, soil pollution, and even air pollution. Illegal landfills are releasing carbon dioxide into the air, which is than causing climate changes.

The Anthropocene is new epoch, which started in 1700s, in Britain with the Industrial revolution and the great boom of technological improvement. With it new opportunities for human race as well as new problems were created. The progress was so fast that people were not realizing the consequences that were brought by the Industrial Revolution. Nature and the environment started to feel a lot of burden, which people cannot managed. What did not seem to be so serious in the past, has turned out to be very serious today.

Human intervention in nature is nowadays indispensable and any step or move cannot be done without it. However, these steps, which are done towards the nature, must be carefully thought out. It is important to know what is going to happened and what are the consequences of humans actions. Everything is linked with everything, so every step taken towards nature should be carefully thought out so people can prevent from anything bad, in the terms of cultivating care.

Resumé

Spolu so začatím priemyselnej revolúcie vo Veľkej Británii v polovici 18. storočia, začal svet pozorovať veľké klimatické zmeny. Priemyselná revolúcia priniesla boom technológie, kvôli ktorej sa životné prostredie a celkovo príroda začali výrazne zaťažovať. Masívna ťažba nerastných surovín, ako napríklad uhlia a jeho následná premena na tepelnú energiu vypúšťala do ovzdušia enormné množstvo oxidu uhličitého. Vedci nazvali túto novú epochu ľudstva "The Anthrpocene". O presnom začiatku sú mnohé dohady, no pre túto bakalársku prácu je za začiatok "The Anthropocene" považovaná práve priemyselná revolúcia. Podporujúcim argumentom tohto výroku sú viditeľné zmeny, najmä čo sa týka množstva oxidu uhličitého v ovzduší. Vzťah prírody a človeka sa od priemyselnej revolúcie zmenil. Kým pred začatím priemyselnej revolúcie nebola planéta Zem vystavovaná takmer žiadnej záťaži, napríklad v podobe ťažby, počas a po jej začatí už áno.

Celkový vývoj technológie zapríčinil, že záujem ľudí a prírodu a životné prostredie ako také sa pomaly vytráca. Borgmann, v knihe Technológia a charakter súčasného života zadefinoval dve základné teórie. Prvá teória, "focal things and practices", sa zaoberá skutočnosťou, že v minulých storočiach, keď technológia neexistovala, alebo aspoň nemala na ľudstvo taký vplyv ako dnes, sa ľudia viac zaujímali a starali o prírodu a životné prostredie. Borgmann to tvrdí na základe faktu, že ľudia boli omnoho viac spätí s prírodou. Všetky zdroje, či už potravy, či ošatenia pochádzali priamo z prírody, skrz ľudské ruky. Uvádza príklad ohniska, ktoré bolo centrom obydlia a o ktoré sa priamo ľudia museli starať.

Týmto vysvetlením prichádza Borgamnn k jeho druhej teórii s názvom "the device paradigm". Ohnisko, bolo nahradené centrálnym vykurovacím systémom a tak aj spojenie ľudí s prírodou bolo nahradené takzvaným stlačením gombíka. Ďalším vhodným príkladom je televízia. V dnešnej modernej dobe, sa kontakt ľudí a prírody v podobe napríklad vychádzky niekde do prírody, mení na stlačenie gombíka na počítači, či telefóne.

Cieľom tejto bakalárskej práce bolo na základe týchto Borgmannových teórii skúmať etický dizajn elektrických kompostérov. Elektrické kompostéry sú novodobou technológiou určenou na redukciu biologicky rozložiteľného odpadu, bez akéhokoľvek ďalšieho zaťaženia a znečistenia životného prostredia. Nakoľko fungujú na báze žijúcich mikroorganizmoch, o ktoré sa zaškolený užívateľ musí starať, sú tieto elektrické kompostéry v súlade s Borgmanovými teóriami a tvrdením, že technológia nemusí nevyhnutne narúšať spojenie človeka a prírody, či znečisťovať životné prostredie. Elektrické kompostéry redukujú biologicky rozložiteľný odpad, ktorý by inak skončil na skládke a hnitím a rozložením by sa vylučoval oxid uhličitý a znečistil by ovzdušie, ktorého znečistenie ďalej prispieva ku klimatickým zmenám. Výsledkom tejto bakalárskej práce je, že dizajn elektrických kompostérov je etický a v súlade s Borgmanovými teóriami.

Aj napriek tomu, že táto bakalárska práca sa nezaoberá a netýka priamo politológie, rozoberaná téma je s politológiou úzko spätá. Ministerstvo životného prostredia neustále aktualizuje novely, nariadenia a legislatívu ohľadne elektrických kompostérov a snaží sa o ich implementáciu do čo najväčšieho množstva zariadení. Európska Únia podporuje členské štáty, napríklad formou operačných programov kvality životného prostredia (OPZKP). Taktiež vyhlasuje rôzne výzvy na predkladanie žiadostí o nenávratné finančné prostriedky (NFP), napríklad envirofondy pre školy. Tieto školy si následne za poskytnuté finančné prostriedky môžu zaobstarať elektrický kompostér a získať tak titul zelenej školy. Ak mi to bude umožnené, plánujem vo svojej diplomovej práci pokračovať v rozoberanej téme a obohatiť ju o legislatívu a celkovú politiku elektrických kompostérov, ktorá je nadmerne zaujímavá, no obšírna a komplexná.

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Another data, which was cited or paraphrased in this bachelor thesis, were used only with permission of JRK Waste Management (JRK Slovensko, s.r.o.) and Dekos R. These companies distribute electric composters into the Europe. They helped me to get the necessary information about electric composters and composting process.

Appendicies

Appendix A:

In this appendix I am showing the reader one of the most important paragraphs from the law about waste management. I consider this interesting and also important for this bachelor thesis in the sense of understanding that waste should be not ignored or taken as unimportant. Originally it is in Slovak language, this is all my translation.

§ 11 vyhlášky MŽP SR č. 371/2015 Z. z.

Facilities for the recovery of biodegradable waste	
composting facility	**biogas station**
Composting / aerobic process **A process, when from the biodegradable waste,** **due to the microorganisms and macroorganisms,** **a compost is created.**	**Anaerobic process** **It is controlled by microbial, mesophilic or remodeled decomposition of substances without air access. Biogas and digestate are produced**
Place **Waste - minimizing odor emission** **Ladfills - action against devaluation of the organic component and the rotting process of the requirement for the composting process**	

§ 11 vyhlášky MŽP SR č. 371/2015 Z. z.

Zariadenie na zhodnocovanie biologicky rozložiteľného odpadu	
kompostárne	bioplynové stanice
kompostovanie proces, pri ktorom sa činnosťou mikroorganizmov a makroorganizmov za prístupu vzduchu premieňa využiteľný BRO na kompost	anaeróbna digescia je riadený mikrobiálny mezofilný alebo termofilný rozklad organických látok bez prístupu vzduchu, pri ktorom vzniká bioplyn a digestát
miesto odpad – ostatný minimalizácia emisií zápachu skladovanie – opatrenie proti znehodnoteniu organickej zložky a hnilobným procesom požiadavky na samotný proces kompostovania	

§ 81 ods. 24 zákona o odpadoch

Obec je povinná umožniť tomu, kto vykonáva zber, prepravu, zhodnotenie a zneškodnenie biologicky rozložiteľného kuchynského a reštauračného odpadu pre prevádzkovateľa kuchyne, na jeho náklady a v súlade s platným všeobecne záväzným nariadením obce

a) zaviesť a prevádzkovať na jej území systém triedeného zberu biologicky rozložiteľného kuchynského a reštauračného odpadu,

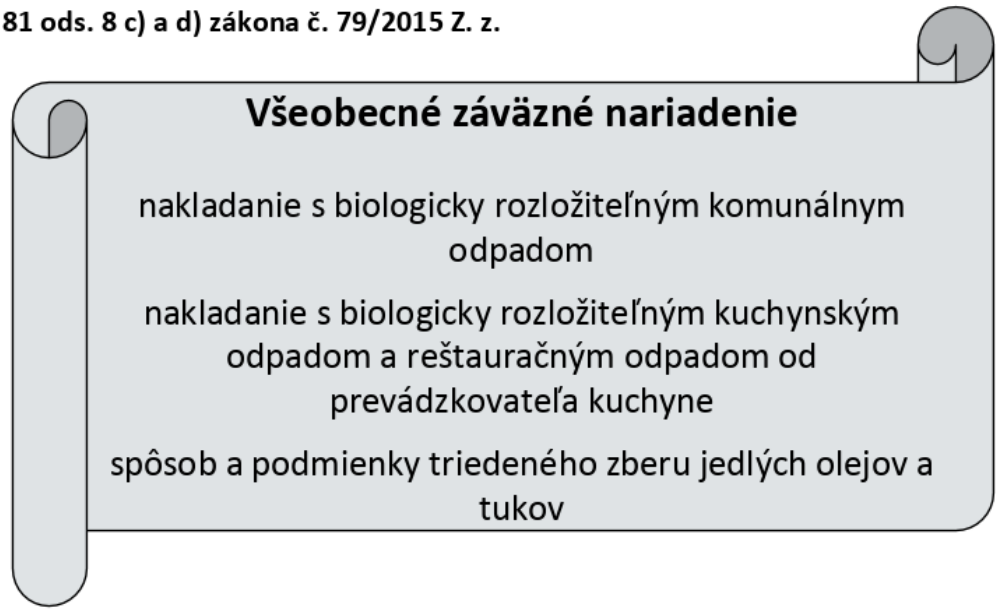
b) užívať v rozsahu potrebnom na tento účel existujúce zariadenia na zber komunálnych odpadov

The town has an obligation to allow the one who collects, transport, recover and dispose the biodegradable food (kitchen) and restaurant waste, for the kitchen operator at his expense and in accordance with the generally applicable town regulations.

a) Establish and operate on town´s territory a system of separate collection of biodegradable food (kitchen) and restaurant waste,

b) Use, to the extent necessary for that purpose, existing municipal waste collection facilities

§ 81 ods. 8 c) a d) zákona č. 79/2015 Z. z.



General binding regulation

Disposal of biodegradable municipal waste

Disposal of biodegradable food (kitchen) and restaurant waste from the kitchen operator

Method and conditions of the sorted collection of edible oils and fats

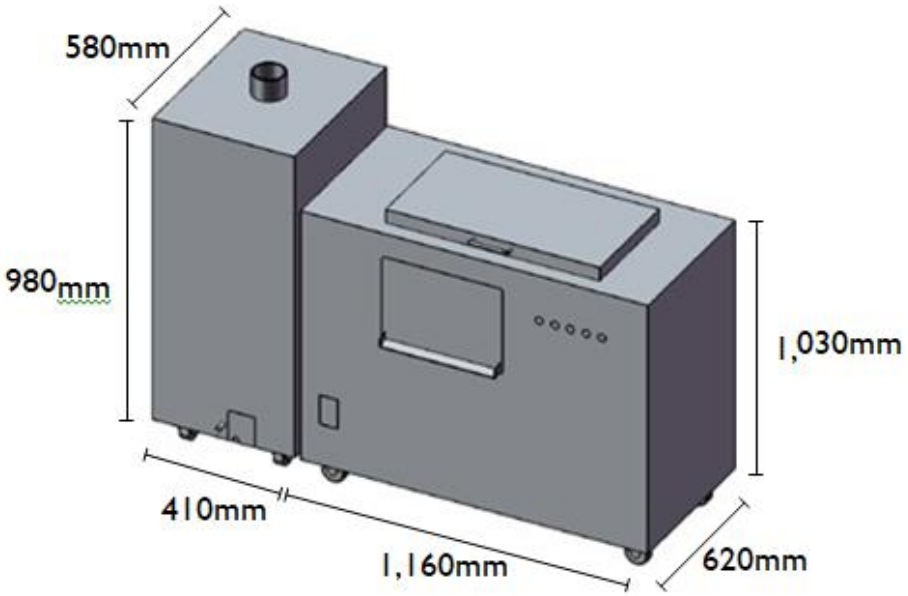
Appendix B:

In this appendix all types of electric composters will be introduced. Choosing the right type of the electric composter depends on the amount of the production of the waste, which has to be processed.

1. **GG - 10**

This is composting machine with input capacity 25-30 kilos per day, which is 10 tons per year. As with all composting machines, the process last only for 24 hours, and the reduction is 90% of whole input of the waste. This electronic device is for small-scale residential buildings or restaurants. For example, in Slovakia it is located in hotel Bôrik.

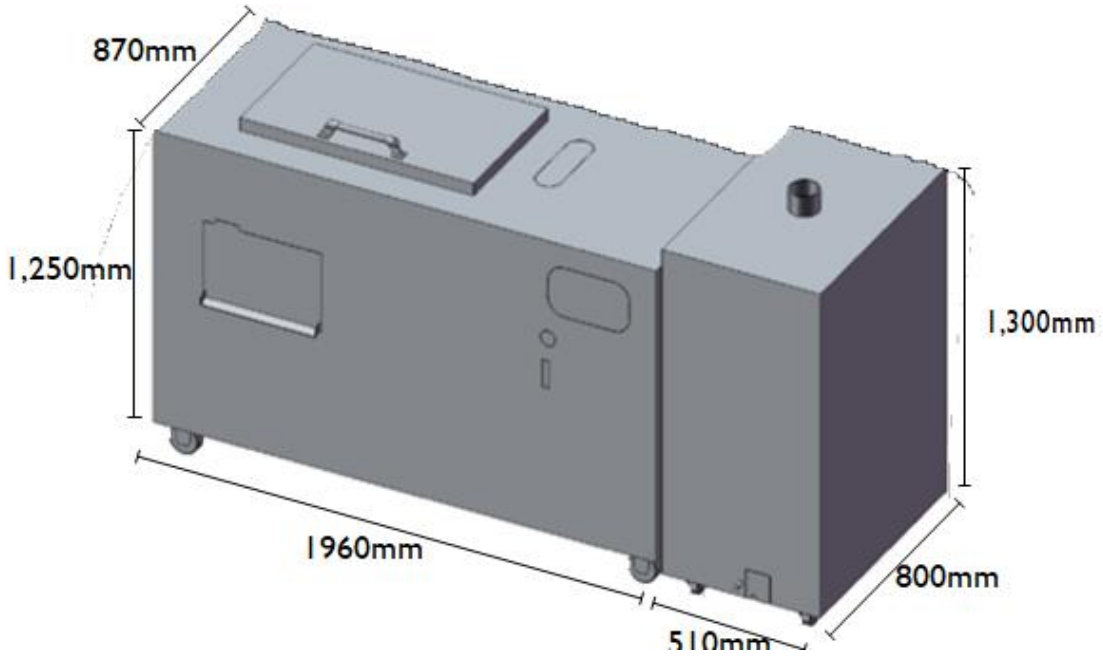
Power consumption on this composting machine is 350-510kWh/month and the weight is 240 kilos. Of course, the machine contains features as energy save mode, smell control and hygienization, just like safety features as emergency stop switch and automatic stop of mixing blades while door is open.



2. GG – 30

This is composting machine with input capacity 80 – 100 kilos per day, which is 30 tons per year. As with all composting machines, the process last only for 24 hours, and the reduction is 90% of whole input of the waste. This electronic device is for small to medium residential buildings, restaurants, or retirement communities. For example, in Slovakia it is located in Primary School Tbiliská.

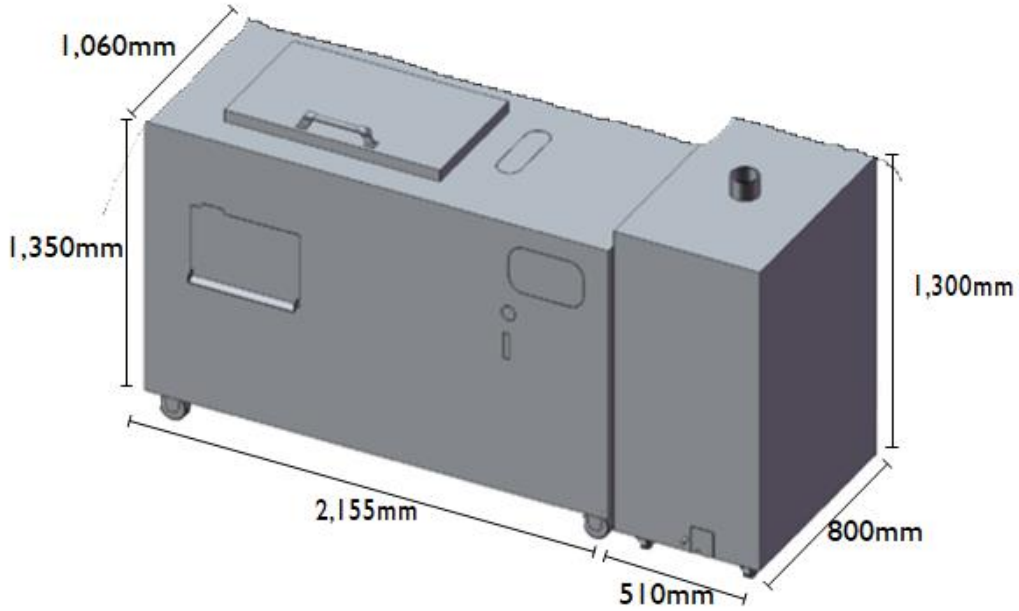
Power consumption on this composting machine is 1050-1200kWh/month and the weight is 450 kilos. Of course, the machine contains features as energy save mode, smell control and hygienization, just like safety features as emergency stop switch and automatic stop of mixing blades while door is open.



3. GG – 50

This is composting machine with input capacity 120 - 150 kilos per day, which is 50 tons per year. As with all composting machines, the process last only for 24 hours, and the reduction is 90% of whole input of the waste. This electronic device is for medium to large residential/commercial buildings, retirement communities, restaurants and schools, or grocery stores.

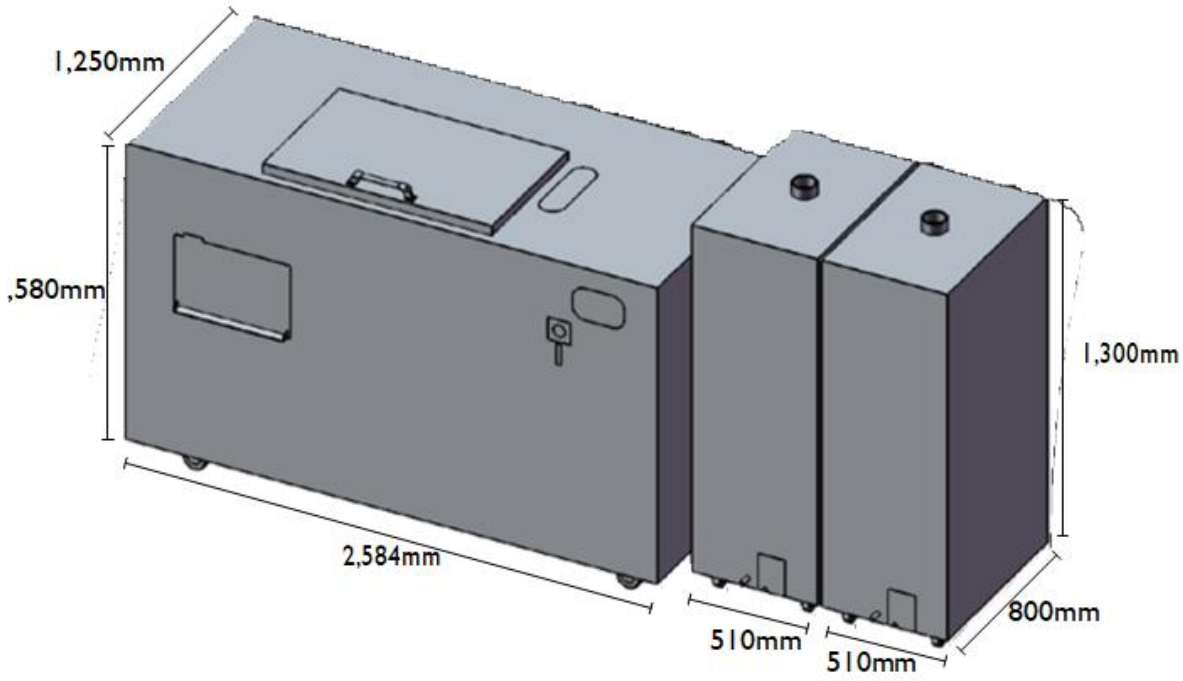
Power consumption on this composting machine is 1650-1800kWh/month and the weight is 660 kilos. Of course, the machine contains features as energy save mode, smell control and hygienization, just like safety features as emergency stop switch and automatic stop of mixing blades while door is open.



4. GG -100

This is composting machine with input capacity 240-300 kilos per day which is 100 tons per year. As with all composting machines, the process last only for 24 hours, and the reduction is 90% of whole input of the waste. This electronic device is for large residential/commercial buildings, retirement communities, schools, restaurants, shopping centers or hotels.

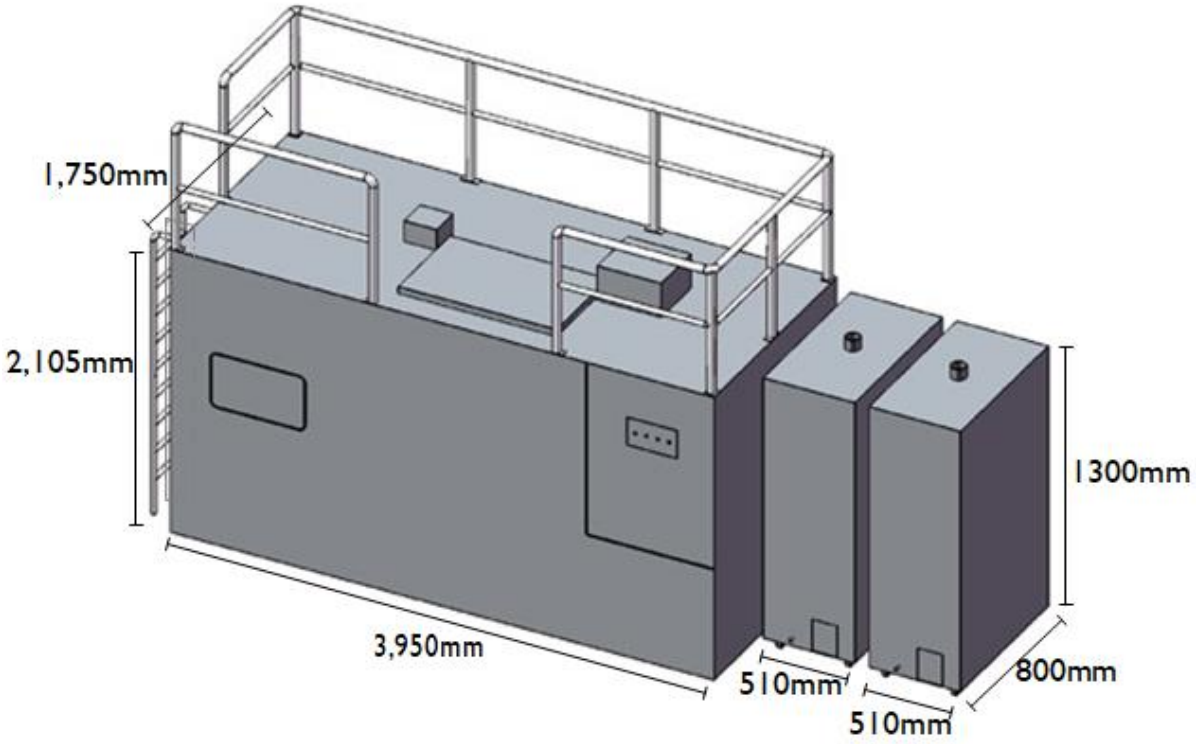
Power consumption on this composting machine is 3000-3300kWh/month and the weight is 1,100 kilos. Of course, the machine contains features as energy save mode, smell control and hygienization, just like safety features as emergency stop switch and automatic stop of mixing blades while door is open.



5. GG - 300

This is composting machine with input capacity 800 - 1000 kilos per day which is 300 tons per year. As with all composting machines, the process last only for 24 hours, and the reduction is 90% of whole input of the waste. This electronic device is for large residential/commercial buildings, shopping centres, schools, hotels, convention centres.

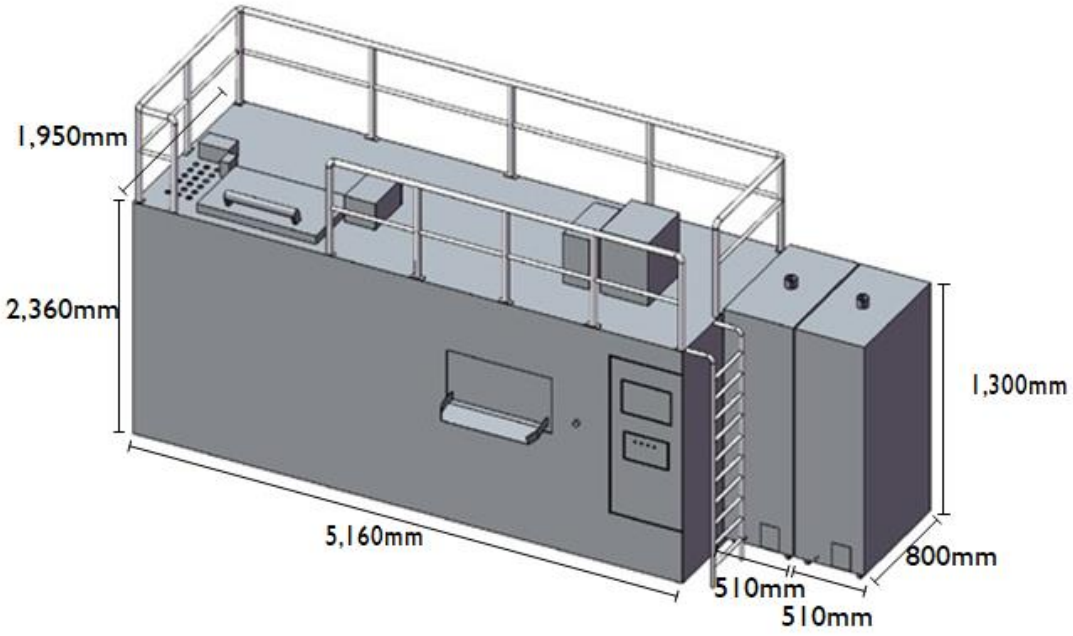
Power consumption on this composting machine is 4050-6000kWh/month and the weight is 3,500 kilos. Of course, the machine contains features as energy save mode, smell control and hygienization, just like safety features as emergency stop switch and automatic stop of mixing blades while door is open.



6. GG - 500

This is composting machine with input capacity 1200 - 1500 kilos per day which is 500 tons per year. As with all composting machines, the process last only for 24 hours, and the reduction is 90% of whole input of the waste. This electronic device is for military bases, or large residential complex

Power consumption on this composting machine is 7800-12,000kWh/month and the weight is 5,500 kilos. Of course, the machine contains features as energy save mode, smell control and hygienization, just like safety features as emergency stop switch and automatic stop of mixing blades while door is open.



Appendix C:

Interview Transcript

I have interviewed two people directly from the industry, which focuses on waste management. . First person is CEO of JRK Waste Management, s.r.o. This company presents itself as a company which is cultivating care of the environment and the nature. JRK Waste Management is trying to prevent the creation of the biodegradable waste. They support separation, recycling but mostly composting of the waste. JRK Waste Management is a distributor of garden composters, electric composters and other equipment into the whole Europe.

Both interviews were done in respondents' mother tongue (Slovak language) and they were translated by me.

1. Introduce yourself with your full name.

Mgr. Radoslav Oliver Košík, LL.M.

2. Where do you work, and what is your position in the work?

JRK Waste Management s.r.o., CEO

3. How long do you work for this company?

Since 2014

4. How did you get into the industry?

Company owners had directly contacted me.

5. Do you want to continue in this work?

Yes.

6. Should people care about the environment? If yes, why? If not, why?

Certainly yes. Environmental care and interest in the environment is closely linked to the standard of living and well-being of the population. As long as the people do not have basic needs (in the sense of Maslow's pyramid of needs), we cannot expect to increase our interest in protecting and caring the environment. Similarly, high well –

being, produces a higher amount of waste (increased viability, consumption) that affects the environment as a whole.

7. To what extent should people interfere with the environment?

People can interfere with the environment to such an extent that they do not harm it. Limits (what is and is not a negative interference) should be given by the regulator. The role of the regulator is, in my opinion, is supposed to secure government management.

8. Do you think there is currently any technology that visibly protects / preserves the environment? If so, which?

Of course. There are thousands of technologies that protect the environment This is due to the development of industry and, above all, to the lack of (or optimization) of resources (material, energy ...).

9. Does simple manipulation of the technology (for example, turning on the fireplace by pushing the button, instead of cutting the wood and keeping the fire burn) replacing real relationship of humans towards the nature?

I do not think so. Simple manipulation of the technology is a matter of design and technological progress. The real relationship of man to nature from my point of view does not reflect simple manipulation of the technology. This relationship expresses the question of its meaning (abortion, waste production), and embodiments (plastics vs. wood or natural materials).

10. Does technology separate us from nature? If so, how?

Technology is in line with the development and progress of the human race. As technology can harm nature, it can also protect it. The decision, whether we are going to be separate by technology from nature, is own decision of everyone.

11. To what extent should people be familiar with the technology they use?

I do not quite understand the question. I assume that people are buying technology, because they want to use it and therefore they know what is technology supposed to do. This means that people are able and willing to know the technology to such an extent that they want to use it. I do not consider important for poeple to know the negative impacts of technology (e.g. carbon footprint, LCA analysis, environmental impacts). This is the task of the regulator to decide which product / technology will be available on the market.

12. Are people able to live / survive without technology?

Very good question, but for better answer I need a definition what we understand under the word technology. In the short term (if we take all of the technology immediately from its users) we cannot survive (a short time to adapt with change), in the long term, yes we can survive (if we talk about more advanced technologies related to electric or other power, we talk about 150 years of the last development, which is negligible compared to the time when technology was not available).

Second interviewed person is CEO of AVE SK waste management. AVE SK waste management is company which deals with the waste management in the sense of disposal and recovery of waste. Their services range from self-employed persons to industrial companies. AVE SK waste management collect and process the waste, but also clean public spaces.

1. Introduce yourself with your full name.

RNDr. Peter Krasnec, PhD. MBA

2. Where do you work, and what is your position in the work?

AVE SK waste management s.r.o., CEO

Association of Entrepreneurs in Waste Management, President

3. How long do you work for this company?

I work in the industry for 18 years.

4. How did you get into the industry?

I started to work in the industry of waste management during my studies at the university and my part time job.

5. Do you want to continue in this work?

Yes.

6. Should people care about the environment? If yes, why? If not, why?

Certainly yes. Care of the environment, in my opinion, is one of the most important tasks of humanity. If we irretrievably pollute the environment, we can endanger the life of not only humanity on our planet.

7. To what extent should people interfere with the environment?

Legislation is a process that can affect both quality of life and environmental protection, so it is important for the public to be involved in and actively influence the legislative process. This can provide greater protection for the environment.

8. Do you think there is currently any technology that visibly protects / preserves the environment? If so, which?

There are many technologies that protect the environment. For example, filters on chimneys that capture exhausted emissions into the air, waste recycling technologies, waste water treatment plants, economical engines on cars (as well as electric cars), and many more. All such technologies help protect the environment.

9. Does simple manipulation of the technology (for example, turning on the fireplace by pushing the button, instead of cutting the wood and keeping the fire burn) replacing real relationship of humans towards the nature?

I do not think so.

10. Does technology separate us from nature? If so, how?

To a great extent, yes, in both positive and negative terms. We often live in the "virtual" world of social networks that can distort the view of the world as well as life itself

11. To what extent should people be familiar with the technology they use?

At least to the extent that they do not cause damage, or do not harm the environment or to their own lives by their use of technology.

12. Are people able to live / survive without technology?

No.