

The cornerstones of a new future

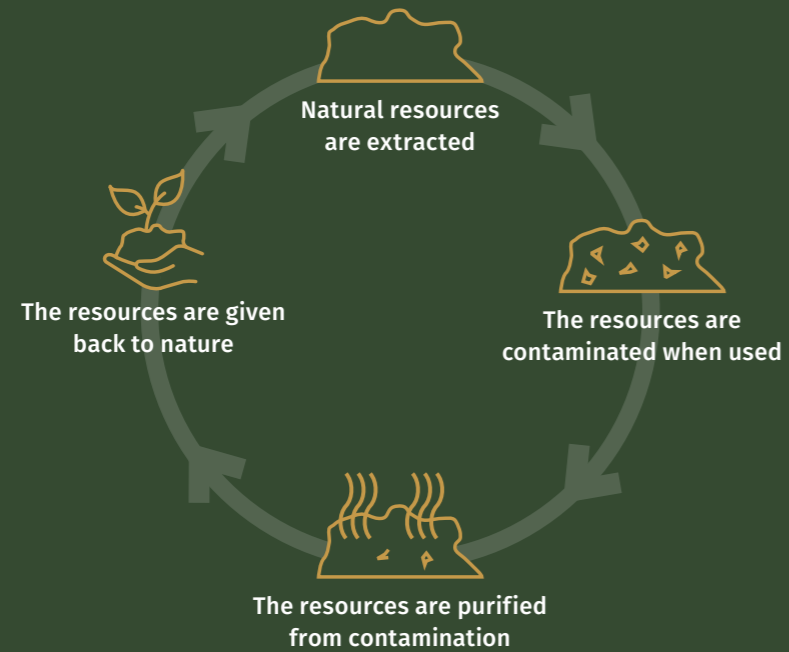


RGS Nordic
Sustainability Report 2019

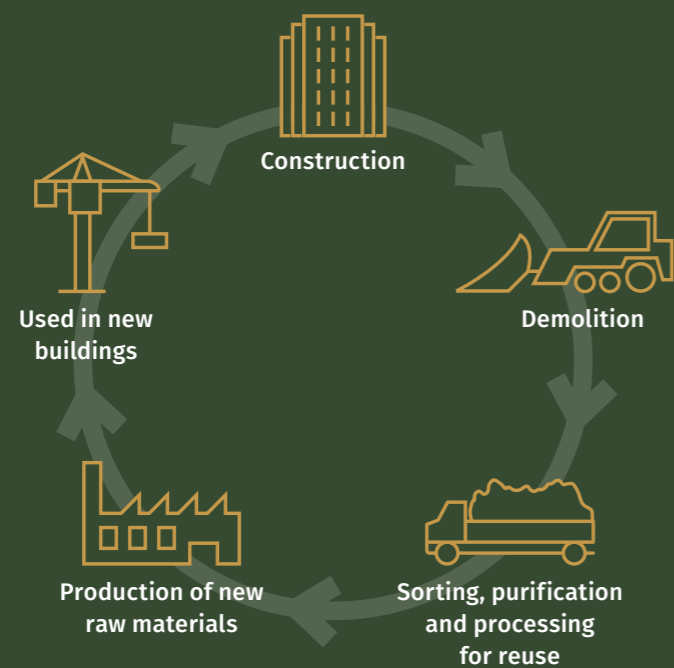


RGSNORDIC

The circle of nature



The circle of construction



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Facing the future

For decades, RGS Nordic has treated and purified construction waste, contaminated soil and wastewater. Sustainability and care for the environment have always been part of our DNA – and they still are.

At the same time we are going through a change. In 2016 we decided to integrate sustainability more directly into our core business and since then the development has rapidly increased.

This is partly because we have made a dedicated effort to make this happen, and partly because our care for the environment, the climate and the resources are top priorities on the political agenda – both in Scandinavia and globally. At RGS Nordic we are fully aware of our role in solving the global challenges. Even though the problems seem big, we will be able to solve them if we all make an effort.

RGS Nordic went from alleviating the negative effects of human activities to creating sustainable solutions.

We have come far, and we are already minimizing the pollution, the CO₂ emissions, and the drawing on natural raw materials. In this report, you will find information on our latest specific initiatives and results.

For several years we have worked determinedly on a sustainability strategy. In 2020 we aim to focus the strategy in a more systematic and proactive direction. In the years to come, we will increase our ambitions and get a new outlook on our company.

What is our focus? Previously we considered ourselves as recipients and treatment providers of waste, soil and wastewater. In the future we will consider ourselves as suppliers of reused raw materials and recovered resources which can be included in the circle of economy or nature.

This is a very big change.

For example, only 5 percent of the construction waste are actually reused as new materials today, while the rest of the materials are utilized at a lower level, incinerated or landfill.


Our ambition is to increase the reuse of waste significantly – to 80 percent by 2030 – and to become CO₂ neutral as well. In addition, we also aim to increase the reuse of soil and water and reduce the CO₂ emissions.

We are very proud and excited to realize these ambitions.

Happy reading.



Henrik Grand Petersen
CEO, RGS Nordic A/S



RGS Nordic employs approx. 280 employees in Denmark, Norway and Sweden who make a dedicated effort to realize our sustainability vision. Many of our initiatives originate from our employees' inventiveness and creativity. Thanks to them, Deloitte has awarded RGS Nordic as one of the 10 most well-managed companies in Denmark, focusing

on strategy, culture, innovation and financial results. The winners were selected by an independent jury, which particularly highlights RGS Nordic for having developed and integrated a clear strategy across the entire organization and for having organized a very experienced management group, which has made RGS Nordic a strong profile within sustainability.

Working with sustainability

RGS Nordic turns sustainability from vision into action.

Our goal is quite simple. We want to give our children a world where the resources of Earth are purified and reused.

However our solutions are not that simple. Purifying wastewater and treating soil involves very complex biological processes. When we transform concrete waste into new raw material for new concrete, very precise quality management is required. For our next initiative – i.e. when we start reducing the CO₂ emissions from the trucks entering and leaving our plants – a complex IT project is the next step.

Our basic driving force is our desire to make a difference – and we have the necessary determination to make it happen.

RGS Nordic has been running an environmental business in Scandinavia for many years, and we are very experienced in the management of construction waste, treatment of contaminated soil and purification of industrial wastewater.

We run the largest commercial wastewater treatment plant in Scandinavia for biological purification of industrial wastewater and reuse of oil. In this process, we ensure that the purified water can enter into the circle of nature again.

For the treatment of soil and construction waste we have more than 30 plants in



Denmark and Sweden. At these plants we ensure that as many resources as possible are reused or utilized and thus can be part of the circular economy.

As sustainability and circular economy have been accepted as the future way of running a business, we continuously play a central part in the industrial value chain.

Previously we were seen as a place where construction companies and contractors could dump their soil and waste – properly and safely. Now we are facing a future where we, to the same extent, serve as suppliers of reused raw materials to the same industries.

Main activities

RGS Nordic works in three main activities:

- Purification of contaminated soil
- Management and reuse of construction waste
- Purification of wastewater

Our plants in Denmark and Sweden manage and treat up to 4.5 million tonnes of soil and construction waste a year. In addition we also purify large amounts of wastewater at our treatment plant in Stigsnæs. Since 1989 we have purified more than 5 million tonnes of wastewater.

Construction waste

We receive and treat all kinds of construction waste. Overall 97 percent of the waste we receive is reused or utilized.

Most of the waste is crushed and utilized for foundations in construction projects where even more materials are reused as new raw materials – e.g. concrete or gypsum.

It is our ambition to turn the scale so that reuse will take up more space than utilization over the next 10 years.

Soil treatment

We receive and treat non-contaminated and contaminated soil as well as soil classified as

hazardous waste. We treat soil at our own plants and "on-site" – thus, no contaminated soil needs to be transported.

Most of the soil is purified and reused. Depending on the purity degree, this may include dykes, baffle walls, regulation of terrains, motor lanes, golf courses, port expansions or climate proofing. However a small part of the soil is so contaminated that it cannot be purified. Such materials are sent to landfill.

We ensure full traceability, solid documentation of quality and proper use of the soil in the next step.

Wastewater

We receive wastewater from all industries and treat industrial wastewater which is too contaminated for public wastewater treatment plants. Moreover, we also receive wastewater from offshore installations that cannot be purified properly at the public wastewater treatment plants either. We measure and document the actual purification efficiency. Overall, we remove more than 98 percent of the hazardous substances before the water is returned to nature, without harming it.

We have 25 years of experience in biological purification of wastewater and our plant is the largest commercial plant in Scandinavia.

From vision to core business

Since 2016, sustainability has been a declared goal for RGS Nordic.

From the very first start up activities towards a circular and sustainable environmental economics, we have focused strongly on integrating sustainability into our business decision making platform. Since then, the fruits of our efforts have increasingly begun to emerge. At first as single results – but since then more systematically and often in collaboration with others.

For example, our collaboration with Rockwool, the world's leading manufacturer of stone wool insulation, on supplying granulated insulation material from demolished buildings, allowing it to be used in the production of new Rockwool insulation. Another example is a project from Kolding where we demolished a barracks building together with other operators. The purpose of the demolition was to build a day care facility at the same plot, partly by using the same construction materials. The experiences from this project were later included in the guidance on resource mapping in construction from the Danish Environmental Protection Agency.

In 2018 we prepared the first fundamental and structured sustainability strategy based on inputs from employees in Denmark, Norway and Sweden. Ten specific initiatives were implemented, and the employees also took initiatives as well.

Basically, it is all about circular thinking so that as much water, soil and waste as possible can be included in the circle of economy or nature.

In the following pages, you can read about four cases from the past years and their results described in further details.

We are completing the first period of our strategy, and we can conclude that RGS Nordic has taken basic steps to make a big sustainable difference.

This development is very complex, however. We have implemented a number of excellent

and viable projects, aiming at transforming more waste into secondary resources, responsible environmental impacts and minimizing the emissions of greenhouse gasses.

In particular, the area of waste is developing. Today, the majority of the heavy construction waste (bricks, tiles, concrete and wood) is primarily utilized as energy or as crushed material under roads etc. A minor but growing part, is reused as new construction materials. The ambition is to increase this growth.

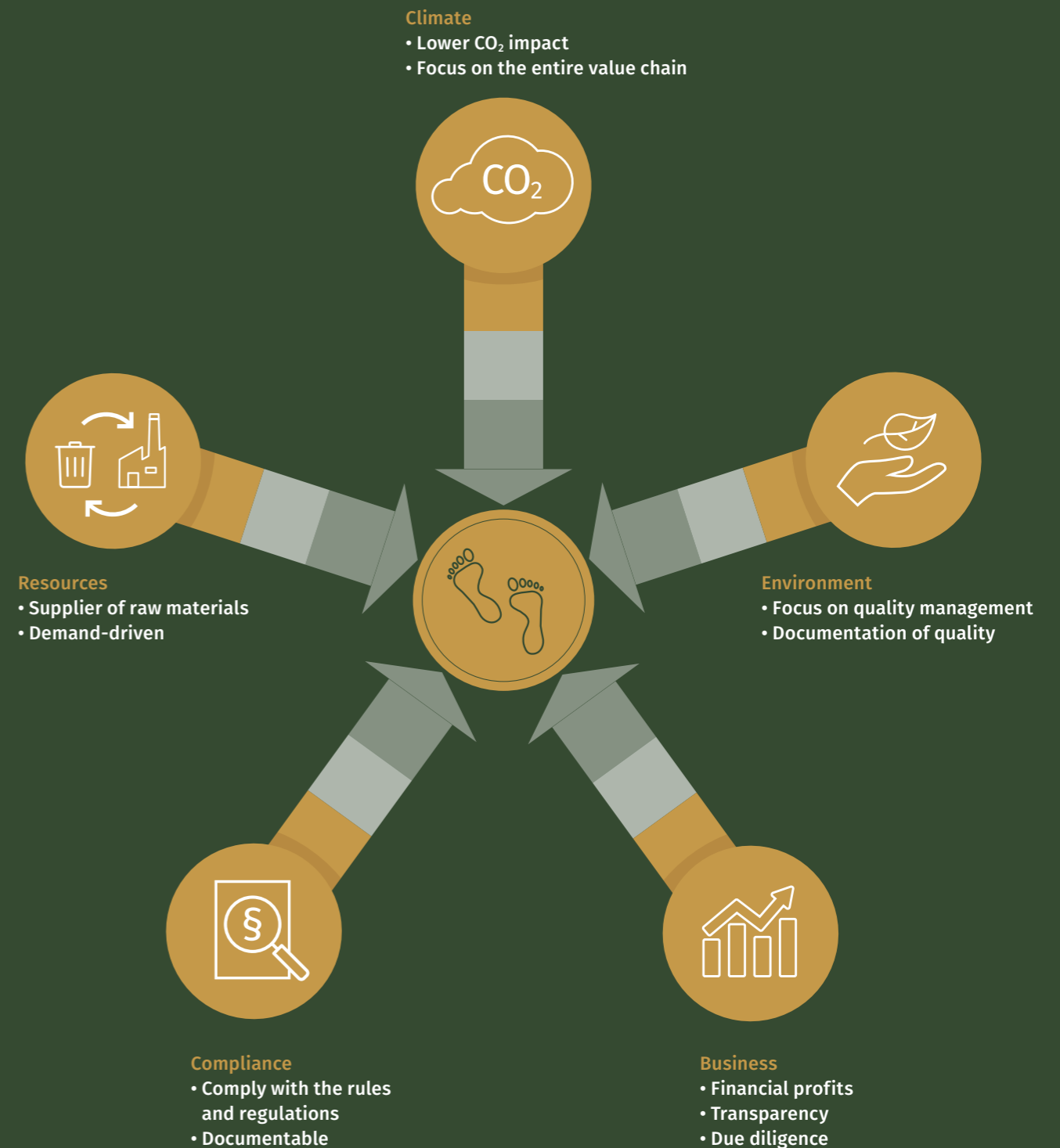
Therefore, some of the last years' successful projects need an upgrade in order to make an even greater difference. Among other things, this is what our future sustainability strategy is about.

As our knowledge has advanced, and society's interest in sustainability has become more integrated, RGS Nordic has also become a more interesting business for the outside world. For example, ministers have visited our company, and our CEO has been chosen as vice president for the Danish government's climate partnership for waste, water and circular economy. Moreover, he serves as president for the industry association ARI – Affalds- og Ressourceindustrien (Waste and Resource Industry).



[▶ Watch the video on the waste hierarchy here](#)

Close connection between sustainability and business



“It makes very good sense to reuse concrete as aggregate in new concrete as there is a growing shortage of raw materials locally. Moreover, it is good for the climate, and our calculations indicate a saving potential of approx. 7,000 tonnes of CO₂ per year.”

Dorthe Mathiesen,
Trade Director, Dansk Beton (Danish Concrete Association)

Case

Concrete has a huge reuse potential



Reuse



Utilization

Concrete is one of the most energy intensive construction materials to manufacture – and one of the most useable, flexible, durable and widespread materials as well.

Therefore, there are good reasons to reuse concrete. It saves energy (and thus CO₂), and it saves resources. Concrete consists of cement, sand and stones, i.e. already limited resources.

Every year, RGS Nordic receives approx. 300,000 tonnes of concrete as construction waste. Traditionally, we have crushed the concrete and passed it on to be used as fills under roads. However, it has been clear for a long time that it is more profitable to reuse concrete in new buildings and thus reduce the need of pure raw materials.

Therefore, we entered into a cooperation in 2018 with the Danish Technological Institute and the concrete manufacturer DK Beton (Danish Concrete Association) on the development of a new technology where reused concrete could be included in the production of new concrete in a better way. The project was supported by the Danish Environmental Protection Agency's MUDP funds.

We succeeded. Every year, RGS Nordic supplies up to 15,000 tonnes to DK Beton (Danish Concrete Association), which sells circular concrete containing up to 20 percent of reused concrete. The crux of the matter is that the quality is certified and can be compared to standard concrete. The concrete type – DK Circular – is often used for sustainable buildings.

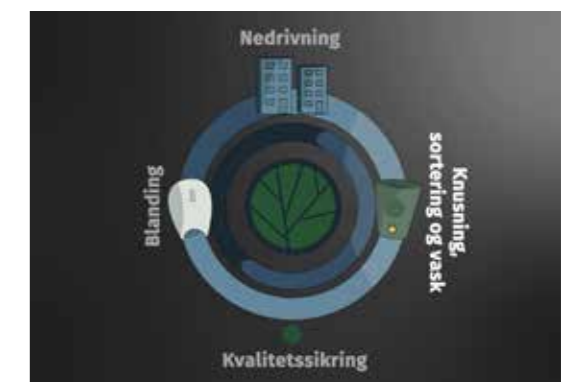
Today, 5 percent of the concrete waste is reused, and the percentage is growing. The remaining 95 percent are utilized as fills under roads and in foundations as well.

According to our assessment, the potential is very large. The current plant has a capacity of 30,000 tonnes a year, corresponding to 10 percent of the concrete waste. As the technology is developing, knowledge has become more widespread and accessible, and more constructions are becoming sustainable, we estimate that about half of the concrete waste will become reusable within the next 5 years.

New roads with concrete

As we have become more knowledgeable about the opportunities to reuse concrete, we have also started to reuse fine concrete dust from the crushing process, which historically has been the least valuable material.

We are now working on reusing the fine concrete as spray concrete and to add to mortar. It has also turned out that the material can be used as packing material around pipes. The size of the potential is still unknown, but this will be clarified over the next years.



[▶ Watch video on reuse of concrete here](#)

Case

Better documentation of water purification

Recycling

Clean water is an scarce resource, and since 1989 RGS Nordic has purified more than 5,000,000 tonnes of water to be included in the circle of nature again. We purify water which is too contaminated for public wastewater treatment plants, and we have the skills and the plants to ensure that the water can be discharged without harming nature.

As the environmental requirements are increasing in society, the documentation requirements from the authorities are increasing as well. At the same time, more of our customers need to document that their wastewater is actually purified from harmful substances and not just diluted with clean water so that it formally complies with the discharge limits.

We have dedicated ourselves to meet this need of documentation. Not because we previously needed or still need to change our purification methods. Our wastewater treatment plants have always purified water by removing harmful substances, no by diluting them and they also will in the future. Full transparency is the best policy – both for our customers, for society and for us.

We believe that the best competitive parameter for environmental companies is to solve the problems in the best possible way – not to cut corners to beat the competitors on pricing.

In Stignsnaes, Scandinavia’s largest commercial biological purification plant for industrial wastewater, we have specifically established a monitoring facility with a measuring method called mass balance.

In brief, this means that we measure the weight of the harmful substances in the water we receive where it then undergoes our treatment process. After the biological treatment, we measure the weight of substances – both in the sludge released and the water which is taken to the next purification step in the carbon filters. When the water is purified in the carbon filters, we will measure the weight of substances in the water once again.

Thus we are able to document how large amounts of harmful substances that are removed during the two purification steps. Moreover we can document how efficiently we remove the substances and the content of the water we discharge after the purification process. In that way we make sure that the water has been purified efficiently, and that it will not have a negative impact on the environment or nature.

So far this measuring method has been conducted on a project basis, and further investments are required for a full-scale implementation at all plants. We expect that this will be achieved within the coming years.



At the biological purification plant in Stignsnaes, which is the largest commercial plant of its kind in Scandinavia, we measure the weight of harmful substances which we collect and remove so that we know the exact quality of the water we discharge.

Documented water purification removes contamination

The water is purified in a process consisting of two main steps. A biological step with an active sludge plant a physical and chemical step with an active carbon filter. The first step conducts the primary purification. For some substances, however, a secondary treatment may be required in the active carbon filter.

The figure below is based on an example of when we receive wastewater contaminated with PFOS. Thanks to mass balance, we can document the amount of removed substances before the water is discharged. This example corresponds to our actual purification activity for the total content of organic matter (COD) and for the substance PFOS.

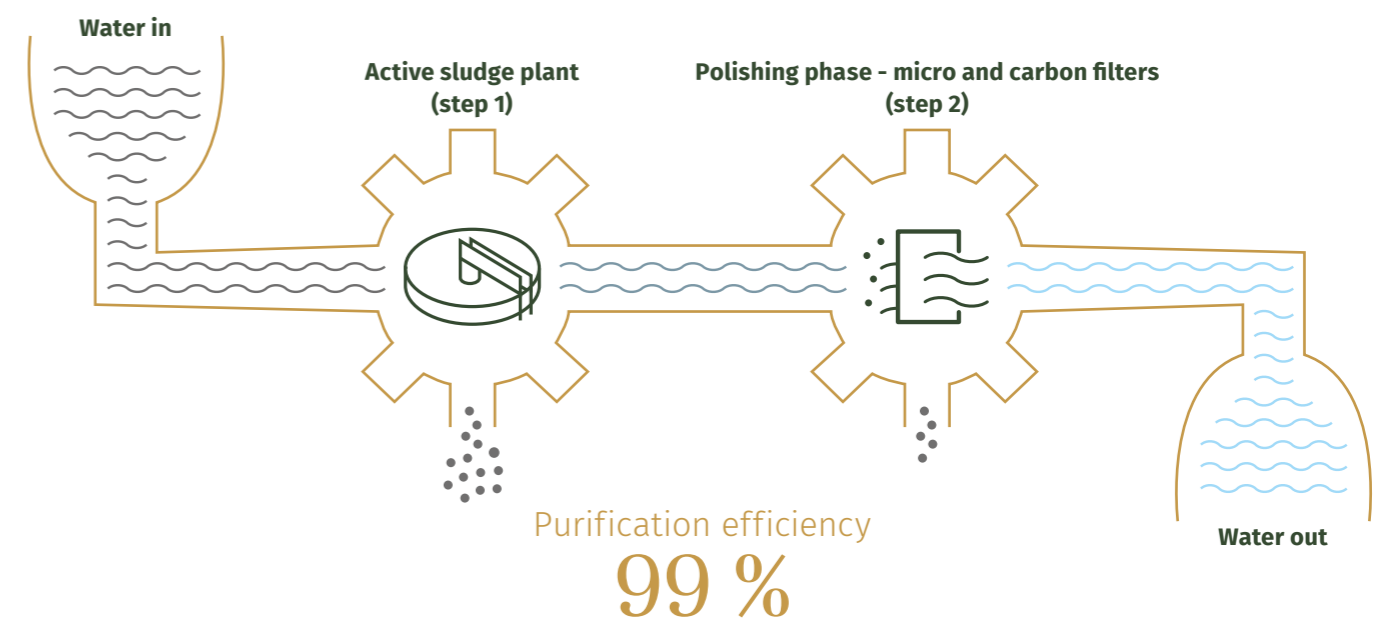


Table: Purification efficiency for the total content of organic matter (COD) and the substance PFOS for 24 hours of wastewater treatment.

Purification efficiency		Unit	Wastewater in	Freshwater in	Water in total	After active sludge plant	After carbon filters = Water out	Purification efficiency
Parameter	Amounts of water	m³	1,490	3,003	4,493	4,493	4,493	-
	Amounts of sludge	Tonnes	-	-	-	13.7	-	-
COD	Substance concentration	mg/l	28,948	0	9,600	565	120	98.8 %
	Amount of substance	kg	43,133	0	43,133	2,539	525	
	Residual content	%	-	-	100.0	5.9	1.2	
PFOS	Substance concentration	mg/l	0.00312	0.00000	0.00104	0.00023	0.000006	99.4 %
	Amount of substance	kg	0.00465	0.00000	0.00465	0.00101	0.000027	
	Residual content	%	-	-	100.0	21.7	0.6	



“The municipal council has decided that future municipal construction projects must be screened for the opportunities to reuse construction materials.”

News from Copenhagen Municipality - 24 September, 2019

Case

Declaration of reused construction materials, for better reuse

Some reused materials are pure and meet the level of pristine raw materials, while others may contain impurities of major or minor importance for their purpose.

For example, we will often be able to supply crushed structural concrete of completely pure quality, while e.g. stabilization materials based on mixtures of crushed concrete and bricks may be contaminated with tar, oil or metal residues or be mixed with e.g. plastic.

Both materials can be reused, but how and for what is very different. You must make sure that the reused materials are used in such a manner that they do not contaminate, and aesthetics and design should be considered as well.

To a large extent, it is all about knowledge.

Therefore, we have implemented continuous batch controls of construction waste where we check the outgoing materials for mixtures and contamination.

Based on this, we prepare detailed material data sheets of most types of reused materials so that the customers get an idea of the content and the components, the risk of contamination, regulatory requirements and recommendations for using the materials. When preparing the content for the material data sheets, we focus on the customers' priorities and how they want to use the materials.

This increases the customers' insight and minimizes the risk of contamination and incorrect use. Thus, it also increases the motivation to reuse materials. And based on the traffic on our website, this is very relevant. The pages with material data sheets are some of the most visited pages.

Our organization of a systematic batch control and complete material data sheets with technical, environmental and climate-related features for all products is expected to be finished within the next years.

In 2020, 3 percent of the construction waste which we receive are reused as new raw materials. A few percent of the materials are deposited where the rest, i.e. 95 percent, such as crushed materials used as fills and foundations, are utilized.

By 2025, it is our ambition that the figure for reuse has increased to 40 percent. In the years to come, it is our ambition that the figure will increase to over 80 percent.

We expect that it will be possible to reuse more materials directly – such as crushed concrete waste for new concrete. However, we also expect new types of materials to be developed. For example, we are working on a new construction material based on a mixture of bricks and concrete.

Case

A digital platform for less empty trucks and a lower CO₂ emissions

Every day, up to 2,000 filled trucks enter one of RGS Nordics' plants in Denmark, Sweden and Norway.

Correspondingly, many filled trucks leave our plants, loaded with treated and processed materials ready to be reused.

However, the trucks that bring and take away materials are not the same. In other words: Many trucks are unloaded – and it is not just here we see that. Generally, between 50 and 80 percent of the trucks are unloaded on the roads.

And that is a problem. Considering the fact that trucks, in particular, are responsible for the rapidly increasing pollution and CO₂ emissions globally. For the European roads only, 30 percent of the CO₂ emissions are caused by trucks.

The problem is really quite simple: Or suppliers unload the waste and leave in empty trucks, while we also transport reused waste ourselves, leaving in empty trucks. Considering those two flows, you can reduce the need of transportation significantly. Both for us – and on a general basis.

Therefore, we have decided to take action. The ideal scenario would be that all trucks, in all business, are always fully loaded on the roads.

It is a matter of knowledge and the courage to share knowledge about the needs of transportation which is normally considered as confidential information.

Our solution is based on IT. We are working on a digital platform so that the carriers entering and leaving our plants can get an idea of the transportation activities and needs so that they can decide to bring a load both ways and thus avoid empty trucks.



DTU Skylab
- where it begins

The project is not finished yet. We are collaborating with DTU Skylab on the development of the platform, and it is crucial that our customers get involved in the project by making data available. RGS Nordic cannot do this project alone.

We still do not know how many empty trucks we can avoid with the platform. However, there is no doubt that the potential is large – both for RGS Nordic and potentially for other businesses as well.

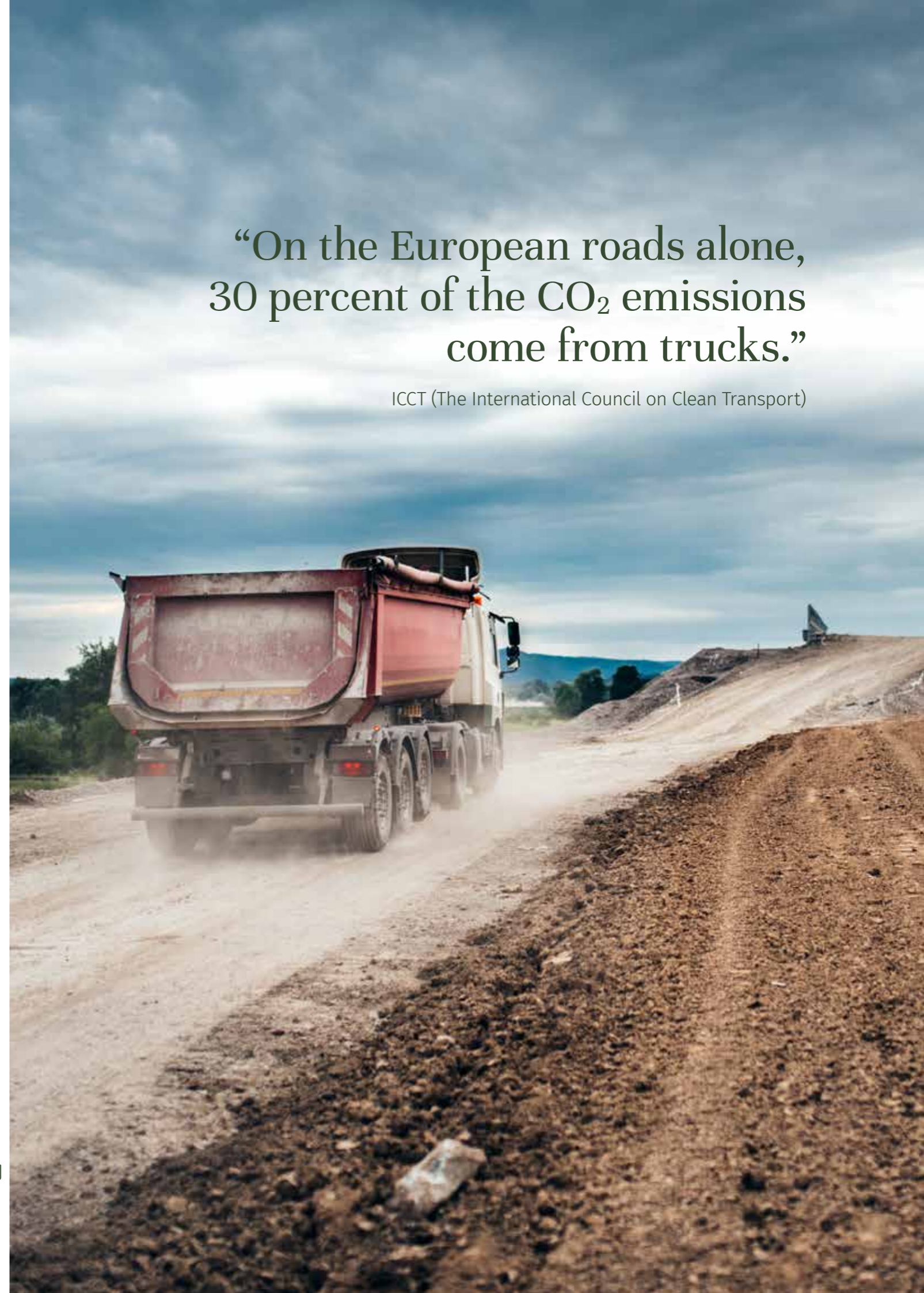
Between 50 and 80 percent of the trucks are empty on the roads.

Deloitte



“On the European roads alone, 30 percent of the CO₂ emissions come from trucks.”

ICCT (The International Council on Clean Transport)



“Every year, we conduct 50,000 analyses of the soil we process.”

RGS Nordic

Case

Better documentation on soil

Recycling

Every year, we handle large quantities of soil at our plants in Denmark and Sweden. Much of the soil is contaminated, but for a large part of it, the scope of the contamination is unknown.

Annually, we conduct 50,000 analyses of the soil we process and remove the contamination as far as possible. This is done through biological or thermal processes.

Before the soil leaves us again, in preparation for utilization, we will analyze its content and contamination degree so that we can specify the applications of the soil.

To a great extent, the biological processes, in particular, are based on empirical data, meaning many years of experience for what works combined with systematic measurements and analyses of the results.

Over the year to come, we expect to finish our project where we, in collaboration with Aalborg University, analyze and describe the biological process in further detail.

We are already measuring the results of our purification processes, so this new knowledge alone will not make our world cleaner. However, it will make it possible for us to control and optimize the biological processes in a better way.

Thus, we achieve more benefits.

Firstly, we will be able to ensure better quality assurance and documentation of our treatment

and processing, including their results. This makes a large gain for those who deliver the soil and those who needs it – both in terms of environment and climate impacts as well as a reliable and responsible use of the utilized soil.

Secondly, we will be able to optimize our processes, meaning that we can process and treat the soil more precisely and thus utilize our capacity better and ensure an optimal treatment of large amounts of soil. This can be very profitable as soil is an inadequate resource.

Thirdly, we will be able to reduce the CO₂ emissions from the treatment of soil.

We expect that we will be able to deliver advanced documentation on all soil we deliver by the end of 2021.



New sustainability strategy

Over the past four years, sustainability has become an important part of RGS Nordics' core business. We are very determined that our business must contribute to a better environment, minimize the CO₂ emissions and reduce the consumption of nature's resources.

Because it is in our DNA, and because it is our duty.

- The UN has set the upper limit for global warming to 1.5 degrees.
- The EU is working on a legally binding climate act which sets the target to become CO₂ neutral in 2050.
- The Danish government has adopted a climate act which sets the target to reduce the CO₂ emissions by 70 percent in 2030.

Moreover, it is clear that RGS Nordics' purification and reuse of construction waste, soil and wastewater is part of this solution.

- According to the Ellen MacArthur Foundation, 45 percent of the CO₂ reduction are reachable through an optimized production and circular economy – including reuse.
- The UN is heading for a more sustainable society in 2030, e.g. with a binding administration of resources, environmental pollution and climate.
- The EU places demands on quality of reuse, demands on statements of actual reuse as well as demands on use of reused materials.
- The Danish government's goal is 80 percent reuse.

What we are already doing and mastering at RGS Nordic is crucial for the realization of the societal goals over the years to come. And we are very dedicated to the cause. Moreover, it is an excellent opportunity to create growth and jobs.

Our customers include those who leave wastewater, soil and construction waste at our plants, and those who purchase processed resources for utilization or reuse.

Our new sustainability strategy consists of 3 pillars.

1. Resources: From waste recipient to raw material supplier

In the future, our customers who leave their waste at our plants will become raw material suppliers. We will strengthen our cooperation with the customers on converting even more construction waste into new applicable construction materials. This is a basic change of our business strategy.

2. Environment: From compliance to quality management

Complying with the environmental regulations is not enough. We have to control and document the quality of our processes and the soil, water and reused raw materials we put into circulation.

3. Climate: From our own CO₂ footprint to the entire value chain

Reduced CO₂ emissions is the answer to the climate challenge. Therefore, we want to document our own CO₂ footprint and the CO₂ profit to our customers as regards the reused materials we put into circulation.

Our ambition is to increase the reuse of construction waste to 80 percent in 2030 as we are moving towards CO₂ neutrality as well.

The strategy was adopted in June 2020 and runs until 2025.



“Our ambition is to increase the reuse of construction waste to 80 percent in 2030 as we are moving towards CO₂ neutrality as well.”

RGS Nordic

