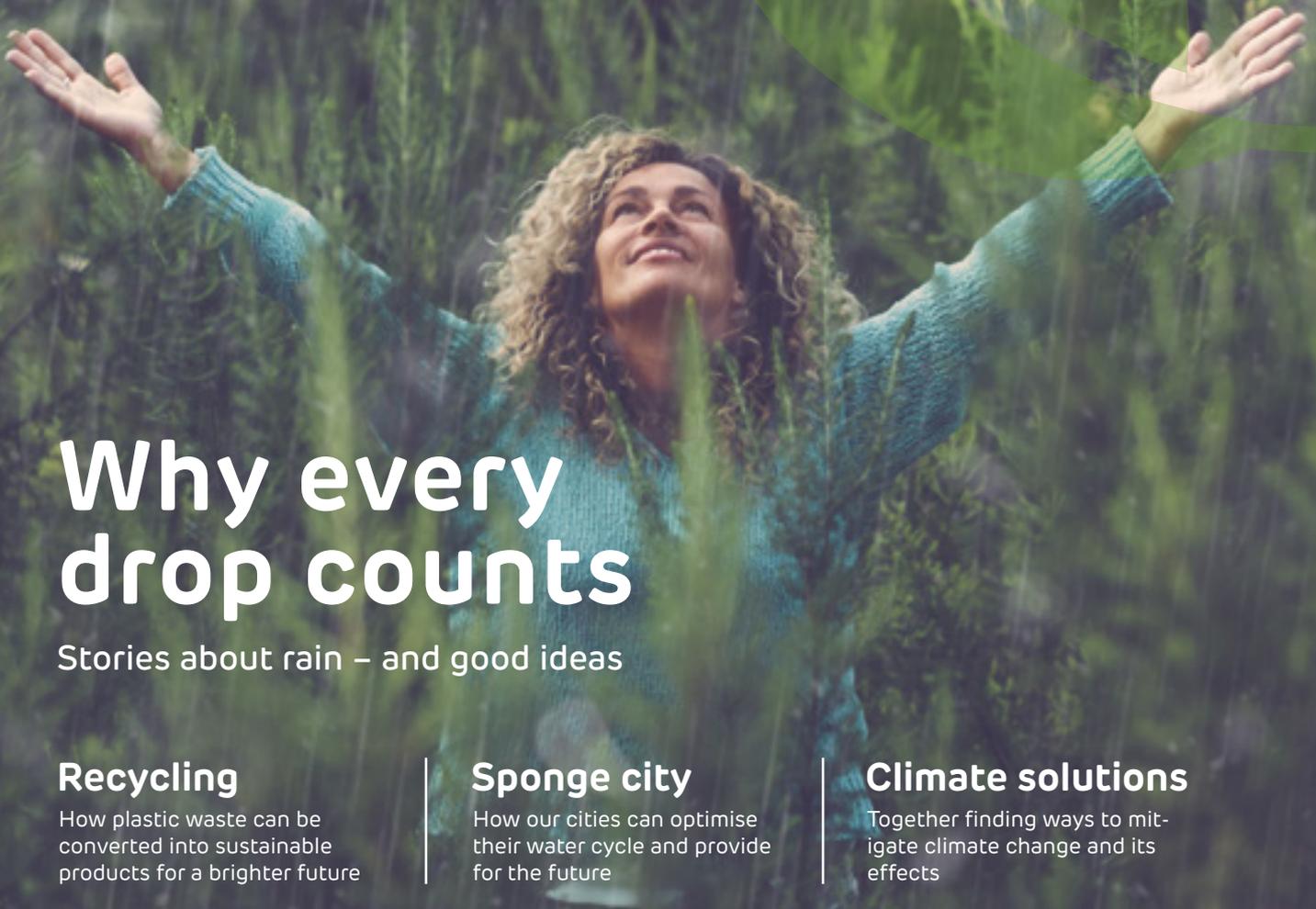




# for a greener planet



## Why every drop counts

Stories about rain – and good ideas

### Recycling

How plastic waste can be converted into sustainable products for a brighter future

### Sponge city

How our cities can optimise their water cycle and provide for the future

### Climate solutions

Together finding ways to mitigate climate change and its effects



First off...



**»Dear Reader, you now have  
in your hands our first  
magazine. And why? Because  
we are on an exciting mission,  
and we want to take you  
with us. Have fun!«**

How time flies! In the next few days our company will be 60 years old. Yet, to be quite honest, that isn't the reason we decided to launch this magazine. Rather, we know so many interesting and fascinating stories about us and our history that we simply couldn't resist hammering the keyboards, taking photos, and combing the archives. But before you start worrying, we are not intending to bore you with an interminable slideshow illustrating the six decades of GRAF history. Instead, my dad will be talking about the beginnings. And in doing so, he will be relating a few anecdotes even I hadn't heard about ... fascinating!

Not only the past, also the present and, above all, the future are important, and we'd like to share with you our plans and expectations. We want to show you how innovative, sustainable ideas can contribute every day towards a brighter future, in an age marred by the progressing ugliness of climate change. Right now, the demand for our ideas has never been stronger.

Have fun browsing,  
reading, and discovering!

**Otto P Graf**  
Managing Director

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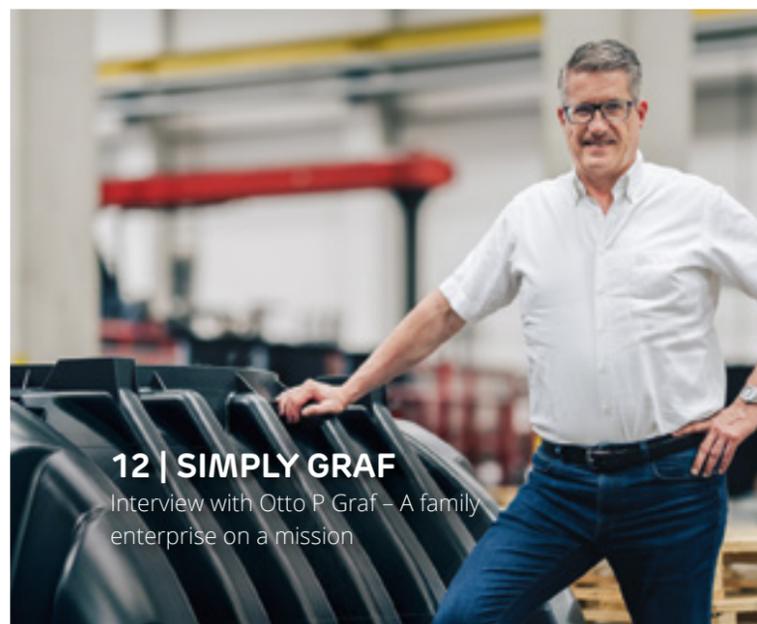
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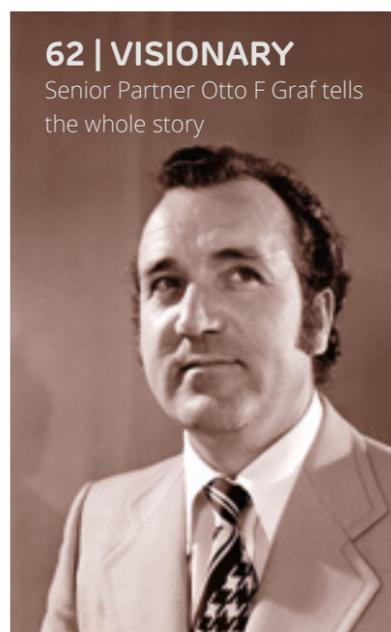
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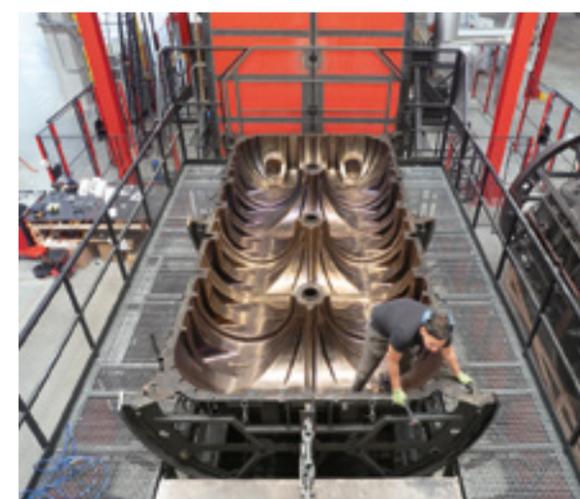
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**<< The joys of gardening**

The harvested rainwater from your Graf tanks or butts not only benefit your garden, but gives you double joy by contributing towards climate change mitigation – and lightening the strain on your pockets. Yet harvested rainwater can do a lot more...

COPY: STEPHAN FUHRER

# Why every drop counts

Droughts, heatwaves, storms: our climate is changing – and that faster than we all thought. Now we need inventive solutions that work. GRAF already has some ideas...

»If many little people in many little places do many little things, they can change the face of the earth!«

*African proverb*

Any situation can be expressed in figures. As statistics, linear and nonlinear graphs, absolute values, or percentages. Yet in the end it is often pictures that stick in memory. Let's take the Ahr flooding disaster. Or the forest fires in Greece, Spain, or Portugal, which undoubtedly will happen again next summer, and the next – and might be the case in our home country too. Pictures of incinerated landscapes, of people who have lost their homes. Or of dust swirling up from under the wheels of tractors and over desiccated farmland, a promise to us of starvation coming yet again to yet more people in this world. This is all the more alarming because nobody believes any more that these droughts are the cause of local freak events ...

**Many of these press photographs are award winners** – thanks to their eye-opening brutality and authenticity. And to their merciless exposure of a truth that we all too often and regrettably tend to suppress in our everyday lives: climate change has long since begun. Extremes are becoming the new normal, according to physicist, climatologist, and author Friederike Otto ("Angry Weather"). In stating this, she refers to storms that have tripled

recently in Europe, and heatwaves more than ten times the previous records in the same period. And this upward trend is continuing. For us in Central Europe, this means that water is turning into a rare commodity. That we should all start thinking about how we handle it. And that inventive, sustainable solutions in this cause are now more urgent than ever before.

**Turning a blind eye – this was never an option for GRAF.** Well, not always: "Who says we're cleverer than the climatologists of this world?" asked Managing Director Otto P Graf, arguing that nobody could have foreseen the rate at which heatwaves, torrential rain, and storm flooding are now increasing worldwide. "Yet we have long been convinced that rainwater would gain in importance over the years," he concluded with assurance.

And so GRAF started developing and refining rainwater management solutions as far back as the 1970s – with a thirst for knowledge, knowhow, and passion. After all, it feels good to do good. And that's why GRAF is particularly proud of its products – its rainwater tanks, its rainwater butts, and even its elements for >>

»On the one hand, the environment; on the other, fuller pockets. What many are unaware of: Rainwater helps you save.«

>> infiltration ditches – and their not insignificant contribution towards making our planet that little bit better every day. “And by increasing our use of recycled plastics, most of which we manufacture ourselves, we also increase our own satisfaction a little,” added the MD.

**By utilising rainwater, you can do good in many ways.** By using it to water your garden, for instance, you are also helping to maintain groundwater levels. Not to mention the trees and other plants, our CO<sub>2</sub> storehouses, which otherwise don't always see through the increasingly hot summers unscathed (quite apart from the fact that many plants prefer rain to tapwater; see pp 36 f). And also flooding prevention can benefit from rainwater harvesting. Storms pose a real danger to the usual configuration of local sewer systems. Sewers repeatedly come up against their limits, and local flooding is the result. Each and every rainwater harvesting system

that retains the precipitation within its borders reduces the quantity of sewage.

**And of course, there are a number of motives of a more personal nature as well.** On the one hand, we have the environment; on the other, fuller pockets. What many are unaware of: Harvested rain can help you to save cash in the form of lower water rates. When you think about it, local authorities determine their stormwater fees based on every square metre of area impervious to rain infiltration. Owners who harvest rainwater and can verify its retention may often apply for a waived or reduced fee. The harvested rainwater is not only good for irrigating gardens, but also ideal for toilet cisterns and washing machines. By utilising all these options, you can save up to 50% of your daily drinking water consumption.

It goes without saying that all of these arguments, in turn, give rise to further questions. We hope, though, that the answers to many of these can be found in the articles on the following pages. For instance, why washing clothes with harvested rain is just as hygienic as with tapwater. Or how plastics are recycled. Ready? Then come and join us in the world of GRAF! You will see: not only can rainwater be particularly sustainable, it can also be quite fascinating ...



# Climate change in figures

More desert, more flooding, and more heat in Europe: our world is growing crazy...

**1.6 billion hectares**

of trees would have to be planted if we are to achieve carbon neutrality by **2050**. This corresponds to five times the area of India.



**41.2 degrees C**



was the highest ever temperature recorded in Germany. It was measured on 25 July 2019 in Duisburg-Baerl and Tönisvorst.

**19,000 people**

died prematurely from heat-related causes between **2018** and **2020**. Above all the elderly are vulnerable to high temperatures.



was the hottest month since records began.



**Spreading desertification**

Or more precisely: **12 million** hectares are added every year to the world's deserts. This is equivalent to the total agricultural acreage in Germany.



**Four times more often**

than in 1970 are extreme weather phenomena like storms, droughts, floods, and fires worldwide.

**10 %**

annual increase in precipitation has been recorded since **1881**. BUT: this is increasingly falling in the winter – and increasingly as stormwater.



**The world is waking up**

All said and done: **65%** of Germans confirm the importance of environmental protection and climate change mitigation. So the willingness to change is there.





PHOTOS: BENEDIKT SPETHER · COPY: ULF TIETGE

# From left in the rain to pole position

From belittled pioneer to world market leader in just 60 years – The success story of the Graf family is marked by daring, novel ideas, and an unwavering conviction: there must be a way to make our world a little better every day!

GRAF has a reason to celebrate. The company has been on the market now for 60 years – and enjoys greater success than ever before. Almost half a century after Otto Graf, Sr buried the first rainwater tank in his garden, this family enterprise has evolved into a global player. Why innovations pay off in the end, what role recycling has in the process, and why no one saves energy so efficiently as the resourceful entrepreneur from South Baden, is revealed by Otto P Graf in an interview with Ulf Tietge.

**Mr Graf, you're smashing record after record in your anniversary year. As soon as one plant is completed, you're adding to it. Are you planning too cautiously, or do you simply like building?**

The key factor here is that it simply needs our products. We simply have to do our utmost for our Earth! And that's the reason behind our claim: for a greener planet. Yet as a company director you have to keep both feet on the

ground and be on the lookout for land suitable for investments. It was a blessing that we could buy 10 hectares in Neuried near Offenburg and start building soon after. Our next step, though, will be aligned more internationally.

#### **Meaning?**

We're working on new plants. We've many plans for Poland, and we're targeting Spain and Australia.

**Despite the energy crisis, the ailing global economy, disrupted supply chains, and Russia's war? Doesn't that affect you?**

From the economics point of view, acquisitions are the be all and end all. There is simply a very, very tight supply of raw materials. Prices have rocketed, energy costs too. On the other hand, we benefit from our ultra modern machine pool that helps us to cut our costs by as much as 80%, and incidentally from the recycled material we produce ourselves.

#### **Rain and sunshine**

Photo shoot: Otto P Graf among Carat tanks still dripping with rain

>>

>>

»Less energy, greater efficiency – that's how we've always been working. Not so long ago this was termed "thrift"; today it's called "sustainability". Yet I do think we were sustainable before the concept was even invented«

Otto P Graf

>> **You invested heavily in a competence centre in Herbolzheim that separates from waste the plastics you need for your products. Why are you doing this yourself? Is this sourcing a core competence as well?**

We've always pursued the target of manufacturing our eco products with the minimum draw on resources. This has culminated in an additional core competence. Disposal companies that collect the Green Dot sacks from end customers actually want to get rid of these raw materials. Basically, we have to think of recycling and product as a unit. Only then can good products come out. Consequently, there is an additional need to manufacture recycled plastics on a par with the quality of new. Only then may we think about the properties of a suitable compound as early as the development stages for the end product.

**But wouldn't that be a company in itself?**

Yes, perhaps. At least it's a core competence in itself. Yet I see it above all as a futureproof commitment. This, I feel, is also confirmed in the strong support we are receiving from the German government and the individual funds, the largest ever, from the UBA. It pays off to be innovative!

**How complicated is it to separate the different plastics from each other? Or, put differently: Are our Green Dot sacks the right way to do things?**

Well, I do think it's the right way. However, I feel we do need a container for secondary resources as well, so that the plastics not bearing the Green Dot can also be included in the recycling process. And then we'll have to see that the eight different plastic types are separated correctly. After all, you can't make a strawberry flan out of fruit salad.

»There's a future in using materials we have recycled ourselves. We're continuing to expand on this!«

**How are they separated? On machines, or do people do that by hand?**

The process we apply is complex. The raw material is supplied in bulk form, placed in storage boxes, and from there passes through the whole production process fully automated. The only persons coming into contact with these raw materials are the QA experts in incoming goods and production. We have infrared cameras that visualise the plastic and activate air jets to blast several thousand plastic shreds to the right or left every second. This process is repeated countless times. We then achieve a purity level of over 99%.

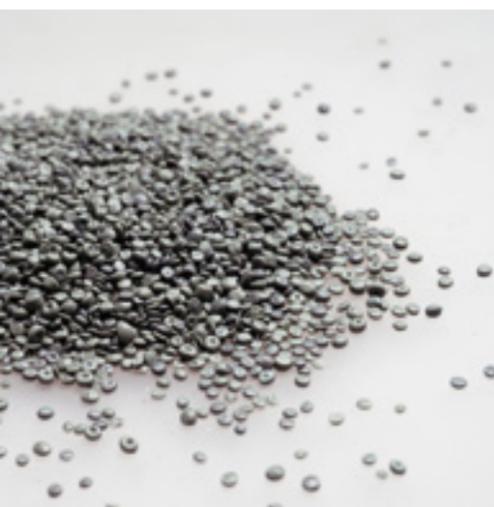
**As you know, recycled raw materials are now in high demand. Whether it's trainers, handbags, or garden furniture, recycled plastics are in demand wherever possible. Is there enough of it at all on the market?**

There seems to be a turning point at the moment. 20 or 30 years ago plastics could be had en masse. Processing them, though, proved difficult, because the technology wasn't available. In the meantime, recycled plastics cost even more than the virgin material because every brand manufacturer wants to advertise with them. And also, and rightly so, because our society, and especially the next genera- >>



^ **Sustainable production**  
The GRAF competence centre in Herbolzheim recycles plastics for own use

v **The result**  
The result is pure plastics that are then melted down and moulded for sustainable GRAF products – a second life so to speak



^ **Visitor guide**  
Visitors come to Herbolzheim regularly to learn how GRAF recycling works

>> tion, can see that something is finally being done to mitigate climate change and to promote the recycling of plastics.

**But if recycled plastics cost more than virgin material, how can you justify its unconditional use? Does that have something to do with attitude?**

It's to do with conviction and long term analysis. I do believe that our eco products benefit from this and that our customers greatly appreciate it. Our Green Planet collection also labels clearly those of our products made of 100% recyclates or containing a very high recycled fraction. The additional advantage we have over other recycling businesses is that we produce only for ourselves. We ourselves define the quality of our products, and consequently of the raw material. This is more difficult for other plastics processors.

**According to public opinion, plastics are marine pollutants and climate killers. As a producer working with these materials for 60 years, how do you see it?**

That depends on what you do with it. We see ourselves as part of the solution in that we take very short-lived consumer goods like yoghurt pots and detergent bottles and convert these into long-lived capital goods. We produce rainwater infiltration systems with a verified stability of 50 years and more. That we ultimately contribute towards less plastic waste being incinerated or exported is undoubtedly a great and important extra benefit for society.

**You no longer speak of tanks and butts, but of climate change solutions, and your new claim is "for a greener planet". What's the object behind it?**

On the one hand, it's about us making eco

**»The less plastic that is incinerated or exported, the greater the benefit for society«**

products. All of our products serve the environment. These we make from highly eco friendly resources on highly energy-efficient machines. We have collaborated in developing machine technologies and operate, for instance, the world's largest injection moulding machine. Its energy efficiency is leagues ahead of any other comparable machine on the market today. And we have just put into operation a new plant in Neuried with a machine running at 90% energy efficiency compared with the competition. This machine is based on an all-new technology developed exclusively according to our specifications. We even wrote the software for it ourselves.

**So why did it need a small family enterprise from Baden-Württemberg to cut energy consumption by 90%? Is this not so important to the others?**

We are the undisputed market leader for these products in Europe. As a result, we enjoy a great advantage. Nearly 10 years ago, we entered the field of large-capacity tanks, but immediately discovered, to our astonishment, that making and fusing the separate parts proved to be highly complex. We therefore collaborated in the development of a machine that could make far larger parts, that >>



#### ^ Doer with great ambitions

On the wall in the Graf conference room is an aerial photograph of the plant – in front Otto Graf explains his plans

>> maximised the ergonomic effects for our personnel, and that cut energy costs at the same time. But that has been our policy from day one. Since our founding days we have rerouted the heat emitted by our machinery to our office buildings and halls, among many other cost saving measures. In those days, this was termed “thrift”; today it’s called “sustainability”. I would go so far to say that we were sustainable before the term was even coined.

#### **How does this affect the employees? Does this mindset from the job turn into a mission?**

We have already noticed that many applicants want to contribute towards our vision of a green planet. This is a passion, also for everyone in management. Our employees also understand the meaning in what we do. And that too helps us on the labour market. We are today so successful because of our employees and executives, who are all for this subject, and others, as well.

#### **Do you see limits to your growth?**

Of course. No doubt the greatest challenge affects the organisation and its structures, which must keep pace. Yet production itself is also evolving with greater complexity, with acquisitions of raw materials on the one side and our entry into machine development on the other.

#### **You mean your recycling work?**

Not only that. Our acquisition measures have led us to join forces with a farmer of 40,000 chickens who operates a plastics recycling

plant – Wilken Plastic Energy. On Bernhard Wilken’s farm in Emsland, the droppings from his chickens are converted into biogas, the biogas into electricity and heat, and this used to wash and dry the plastics we need (more on pp 20 f). Our integration therefore extends far back. And then we also target a very wide range of plastics. And of course, if we were now to say that the next step involves aligning our production along more-international lines, then we’ll need to adjust our management structures at home to maintain its coherent whole.

#### **Talking about home, how is it at yours? Who’s the head gardener?**

Most of the work is done by a capable hand, the rest I do with my two sons.

#### **The watering as well?**

Of course!

#### **And fully automated? Or are you one of those who like to stand there with a hose in the evenings to come back down to earth?**

It’s all almost fully automated. And I have tried to choose plants that don’t need special care and can see through the occasional dry spell. However, I do use rainwater. We have tanks that can see us through protracted dry spells, which we can then simply switch on and off. All easy-care!

#### **Sounds like a big garden.**

Well, it’s not that big, but the space it offers we have used to the full. It’s a matter close to

my heart. My dad installed the first rainwater system nearly 50 years ago. It’s still there, has never had to be cleaned, and the water is still clear and odourless.

#### **How did your dad know in the 1970s that he was backing the right horse with rainwater management solutions?**

My father was convinced of the practicality of harvesting rainwater. Basically everybody understood this immediately. Our composters, though, were generally met with a condescending smile. And then our perseverance paid off. Just a few years later, our composters were selling like hot cakes. It was probably just my dad’s pigheadedness when he said: “Now I’ve got started, there’s nothing like carrying on!” When I entered the company, I soon saw that we were already offering solutions to problems of growing urgency, and we have continued to expand our portfolio as a result. We were introducing the first rainwater tanks on the market before the Green Party even existed. In the early days we were battling against a strong headwind. Today the wind is from behind. Many are saying we were lucky, but that can’t be all.

#### **In 1996 you entered the company directly in the post of managing director. Could you take the helm with ease, or did you have a lot to learn?**

Of course, I was already familiar with many of the processes at the company after spending the holidays working here, mostly in shipping! I know how to handle a pallet jack and forklift, and learned early how to tackle the work at the company. What I did have to learn in the beginning, for example, was how to manage personnel.

**»Our employees and executives believe in our common vision. To them we owe our success today«**

#### **How hard is it to be suddenly the boss of everyone after first helping out as the boss’s son?**

I was expecting it to be just that. However, it didn’t turn out that way, and everybody was very happy that business continued as usual. I studied economics, worked for four years at a management consultancy, and met with success there. There I learned the importance of good employees and executives that you could trust 100%. And among the executives reporting directly to me there is zero fluctuation. Here we have persons of absolute trustworthiness who know their job.

#### **Was it always clear that you would take over the family business from your dad?**

Basically, yes. It was important to me that I could make decisions myself. This was not part of my job at the management consultancy. To do the analysis, to know the way, and then to pass the decision on to someone else... that was frustrating. I would have preferred to take the helm myself. The sailing may be a little choppy at times, but then you correct course and steam on.

PHOTOS: NICO HERZOG · COPY: STEPHAN FUHRER

# Farmer Wants Plastic

Farmer, inventor, green crusader, Bernhard Wilken is as versatile as his enterprise in Emsland. Not only is it a chicken farm, but also part of the GRAF recycling loop.

*»Nothing is wasted, it's all part of the whole. This is how we maximise sustainability when cleaning plastics«*

**If there's anything that drives the boss up the wall, it's wasting energy.** "Oh, Mr Wilken won't like that!" remarked one of his workers in confirmation, albeit tongue in cheek. Yet he's supposedly right: "Everyone's talking about sustainability, but closed loops have always been part of our everyday lives," he added. And so this family farm in Haren not only operates its own biogas plant for its own energy needs, but also utilises the extraneous heat to condi-

tion its henhouses and to dry washed plastic, which is then recycled later. Also the poultry is not given just anything to pick at, but organic feed from the farm's own fields. The droppings are then returned to the biogas plant. Recycling à la Wilken. So how exactly does that fit together with farming and plastic? We are best telling our story from the beginning ...

**We are in Emsland,** only a stone's throw away from the Dutch border. On a plot of land whose luxuriant green not only looks delightful at first glance, but also seems to stretch to an improbable distance. Where else but Northern Germany. In the foreground of the Wilken farmyard the spring wheat is rustling in the wind. Clouds are gathering from the west, promising rain, but not yielding any. "Pity," opined Bernhard Wilken taking us later across his farm. "We really could use it to keep everything here nice and green." Nevertheless, >>



**Farmer-cum-inventor**  
Bernhard Wilken is the driving force behind refuse to recycled



**Grain cycle in Emsland**

Farmer Oliver Lackmann is inspecting the premature crop in his field. Later it will be fed to the farm's chickens. The remainder lands in biogas production.



**<< The Wilken farm**

Field, henhouses (top left), biogas plant – all part of the whole

**∨ Family enterprise**

Bernhard Wilken in conversation with his son Henrik. The horses have retired to their stables



**^ Nordstream Wilken**

The gas the farm generates is pumped through kilometres of piping to the washer

>> the farm horses have preferred to retire to their stables, just in case.

The farm has been run by the family since Granddad Wilken set it up in 1931. Bernhard's dad made the farm his main source of income. His son, a technology fan all his days, then opted for an agricultural training programme, a farming job on the side, and a construction mechanics apprenticeship to boot. A blessing when we consider how the germ of the Wilken Group has evolved out of the farmyard now benefiting from the next Wilken generation in the form of the son's own son Henrik. Thanks to Bernhard Wilken's dexterity and his understanding of machinery and mechanisms, the family enterprise has enjoyed considerable growth.

His employees now number 65. Of these, 45 at Wilken Plastics Energy see to the shredding, washing, and sorting of incoming plastic waste. From here, a large part of the plastic waste is shipped to the GRAF Competence Centre for Raw Materials in Herbolzheim, where it is recycled and reused – for durable solutions in the important segment of rainwater management. And sustainability evolves a little further on – to the finished product.

**Shredding, washing, drying:** When asked, with burning interest, how he ever arrived at such an idea, Wilken replied: "In principle, the processes employed to wash plastics are the same as those to make feed." And this as soberly as the people in this remarkable region simply are: people whose isolation

has made them dependent on always having good ideas. "It was just obvious to me, and on top it annoyed me that we couldn't use the extraneous heat from our biogas production for anything but heating the henhouses in winter," he continued, explaining that the heat simply evaporated in the air in summer. Now, a 6 km pipe conveys the biogas under the family's fields to a combined heat and power (CHP) unit that Bernhard Wilken himself planned and designed for the washing and sorting station a good 15 years ago. There the gas is converted to heat and electricity. "Nothing is wasted any more. It's all part of the whole," said Wilken. And outputting a good 6m kWh, there is even some left over for neighbouring farmers.

>>

**Specialists at work >>**

Authorised officer Tatjana Franke and Bernhard Wilken inspecting the works yard

**What have we got there?**

Processed plastics being scrutinised in the inhouse laboratory



**<< Waste off the assembly line**

In the washhouse, the plastic waste is first shredded then washed and dried. The huge amounts of energy needed for this are generated by the farm's own biogas plant

>> The family enterprise produces the energy it needs with complete self sufficiency. And to boot, the business also affords a major contribution towards climate change mitigation: the plant saves each year the CO<sub>2</sub> emissions otherwise generated by 1300 passenger cars. The boss is convinced: "These are the facts we all have to tackle with greater dedication in these times. After all, Nature doesn't waste anything either."

*»Cycles help to mitigate climate change. That should now be clear to us all. The best example is Nature. That doesn't waste anything either«*

**Bernhard Wilken drives us over to his plastics processing station.** Of course in an electric Audi, seeing that electricity is generated at home. 6 km from the farm, close by the motorway, we finally spy the Wilken logo on the gate. In the yard, a truck was loading freshly washed shredded plastic. 25 tonnes when full. Four of these trucks leave the premises nearly every day. Or 35,000 tonnes of recycled material processed at Wilken Plastics every year. Talking about processing, this also makes use of the water that has washed the plastic. The wastewater is then routed through a special filter system, collected, and clarified. A cycle – what else?

All around the old production hall deliveries of plastic waste are towering metres high – ready for shredding, washing, and sorting. But they won't be there for long. There come from the hall noises of machinery. They are running under full load. There's more than enough to do. The demand for presorted, processed recyclings is huge. So huge that right next door Bernhard Wilken is already building a new, even larger plant promising greater perfor-

mance and higher efficiency. Many ideas are the boss's own.

And he was willing to pay EUR 10m to realise them. This native Emsland inventor is convinced: investing in sustainability was the right decision 15 years back – and even righter today.

**At nearly one-minute intervals, a wheel loader dumps the plastic waste into a hopper.** Afterwards it is transferred to the sorting systems, whose development is also due in large part to Bernhard Wilken, where the plastics are separated into their different types. How do these machines work in detail? "That's our trade secret," revealed Bernhard Wilken with a sly grin. Something to do with loops. At least as we've understood it ...

PHOTOS: JIGAL FICHTNER · COPY: STEPHAN FUHRER

# The story of a shred

GRAF in Herbolzheim runs one of the most modern recycling plants in the world. Here millions of yogurt pots and other refuse are converted into valuable raw materials – which are then transformed into climate solutions. Sustainability at near perfection...



**<< A handful of waste**

This is what input stock looks like at the Competence Centre for Raw Materials in Herbolzheim. That this transforms into durable quality products is hard to believe.



**»At a time when other manufacturers are still considering using recyclates, GRAF is already a big step ahead«**

**Franz Untersteller**  
State Minister of the Environment  
of Baden-Württemberg

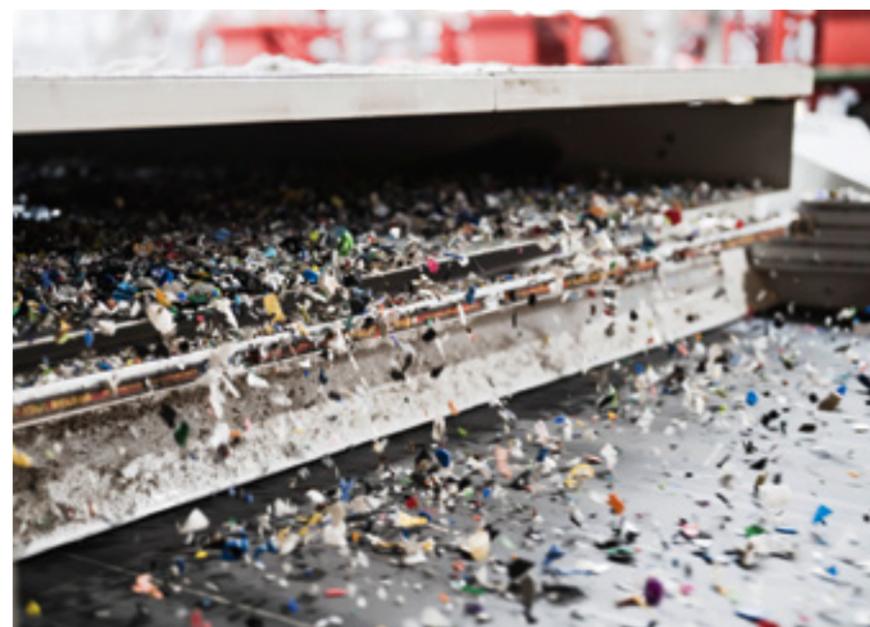
Plastic is not the same as plastic – “That’s something you need to know before you can understand what’s going on here,” remarked Jörg Dräger before taking us on a tour through the Competence Center for Raw Materials in Herbolzheim. We are captivated from the first moment on – and flabbergasted: Where’s all the waste that’s recycled here for new eco products? You can’t see it, you can’t smell it... “There it is,” said the GRAF Head of Raw Materials Management with a wry smile, pointing down into a shaft with concrete walls where countless colourful shreds are piled metres high. It doesn’t look like waste, more like a treasure chamber for carnival clubs, a ubiquitous phenomenon here in South Baden. Confetti for the next few days of wild fooling. “And it doesn’t stink because the shreds have already been washed several times,” explained the specialist, whose job at the plant is to safeguard the constant supply.

“The Competence Centre for Raw Materials is an essential component of our strategy for the resource-friendly production of environmental products,” explained Managing Director Otto P Graf to the State Minister of the Environment Franz Untersteller attending the inauguration. After all, he continued, the location itself embodies 100% sustainability: “We create jobs in the vicinity of our existing production sites, thereby minimising emissions from transport; produce environmental products from recycled plastics that in turn are fully recyclable; and use rainwater as process water and coolant in the preparation of our raw materials.” This meticulously planned concept met with the approval of the guest VIP from Stuttgart: “At a time when other manufacturers are still considering using recyclates, GRAF is already a big step ahead.” His conclusion: The company is thus setting an example and making an important contribution to the conservation of limited natural resources. And to the >>

**You could say we have just entered the hallowed halls** of the company. The heart of the complex, inaugurated in 2020 and still quite new, where 23,000 m<sup>2</sup> of floor space extract the raw material for GRAF products – from normal household waste like yogurt pots, shampoo bottles, and crisp bags. Over 70% of the GRAF product range is now made of these recycled materials. And this upward trend is continuing. On inaugurating its competence centre, the company has consolidated its position on the otherwise hotly contested market for raw materials. Yet also the company’s own substance benefits from this.

**Sorting, sorting, sorting**

On their travels through the Competence Centre, the shreds pass through the most diverse sorting stations. There they are detected, analysed, and manipulated by an array of optical aids, hitech, and much more. A joint development with crucial contributions by GRAF engineers, this process is the only one in the world capable of separating black plastics from each other





**Raw materials expert**

Jörg Dräger's job in Herbolzheim includes seeing to the uninterrupted supply of plastic waste



>> mitigation of climate change. This processing and recycling saves each year 100,000 tonnes of CO<sub>2</sub> emissions otherwise generated when new raw materials are used. This corresponds to the annual emissions produced by 60,000 passenger cars.

**Jörg Dräger takes us deeper into the imposing hall.**

We are so to speak on a kind of paperchase, even though we can see the shreds only briefly now and then, when they shoot over diverse conveyor belts or when the machines have inspection ports. Else behind the scenes the transport takes place over an elaborate system from station to station. Otherwise the halls themselves are spotlessly clean. There are no shreds flying about. And still we can smell nothing ...

"Here we make use of the most diverse systems that separate and sort the plastics from each other," explained the Head of Raw Materials. Targeted are polyethylenes (PE) and polypropylenes (PP), both high quality polymers that do not react with other substances and retain their excellent recycling properties. "These are extracted with the most diverse methods, for instance hitech cameras and infrared systems for detecting optical attributes," continued our guide. Fascinating! "How many of these stations are there here?" we wanted to know as the very first thing. "More than 20 worth 300,000 euros each," replied Dräger.

Of course, a system of such complexity does not arise from one day to the next. Long before the first turf was dug here in Herbolzheim close by the motorway, GRAF engineers had

for years been meeting at their regulars' table in Teningen to develop the whole process on a trial installation. A lot of honest work has gone into this cutting edge innovation, and the technology behind it is unique in the world. "Many thousands of working hours have gone into this. Yet seeing how it all works as a whole is a wonderful feeling," he confided. He compares it a little to the first tentative steps taken by your own child ...

**A few machines on, and we notice on our tour the first odours,**

a little like candles that have just been blown out. And in actual fact, we have arrived at the end of the sorting stations. From here on, the plastic shreds, having been reduced further in size, are melted down and granulated. A large part of them are transferred to the huge silver silos in front of the plant where trucks load the material and convey it to the other production sites in the region. To Teningen and Neuried. And to Dachstein, in Alsace. All pretty near. Yet a part is reused immediately and directly on site. Now emerging from the machine is an EcoBloc, a ditch element for the infiltration and retention of rainwater. A yogurt pot just before, and now a freshly made, smart climate solution. If that doesn't smell of the future ...



**No water, no nothing**  
Or put more optimistically: Water is life. It transforms desert into an oasis. It's better we appreciate its value and use it sensibly!

COPY: THOMAS GLANZMANN

## Dry times

In years of drought, groundwater levels sink by a quarter of a metre. In 2022, therefore, the taps in a number of communities remained firmly closed. Nature needs water to refresh groundwater – the basis of our drinking water supply

Imagine turning on the tap, and no water comes out. We should thank our lucky stars that there is no imminent danger of this. At least not on the regional level. Yet recently, in 2018 and 2022, smaller communities beyond the reach of major cities experienced sporadic disruptions to their drinking water supply, and reality assumed a horrific aspect. No water for the laundry, none for coffee, not to mention the garden ...

The years 2018 and 2022 were marked by droughts with serious impacts on the water balance. Since the beginning of the millennium

observations have detected the following pattern: less rain in the spring and a congestion of high pressure zones obstructing effectively the formation of clouds in the summer months. This can be found in the records of Germany's environment agency UBA. During these droughts, groundwater evaporates to such an extent that there is not enough left to counteract the effects of sunlight, and the soil heats up as a result. Droughts then commence even earlier in the year and then, in summer, are joined by heatwaves. And every extra tenth of a degree will make this situation worse. >>

>>



**<< The dry riverbed**  
In early July of 2022, the river Dreisam through Freiburg ran dry

really be a shock to us all. Does this mean the end of the green oasis behind our homes? Of course gardeners are also struggling with this unexpected increase in dry weather. And just for the record: in California, many landscapers are offering to spraypaint lawns that have suffered from drought.

**>> Groundwater** tells us this. In drought years, the groundwater levels in Germany sink on average by about 25 cm, and in the following years an additional average 10 cm. As you can see, it takes a lot of time before the situation starts recovering. Invaluable time, for the impact of a drought hinges on its duration. Whereas major rivers like the Rhine or the Elbe need several months before their levels start sinking, the vegetation on sandy and hilly terrain start feeling the pinch after only a few days. And in smaller waters there is a threat to diversity. The forests too are faring no better. The drought years 2018 and 2022 caused irreparable damage even to fully grown trees. So much for the direct impact on nature. Let's take crops: in 2018 the harvests of wheat, potatoes, maize, etc., fell by 10–20% under the index averaged over many years. That this is a consequence of excess temperatures should

**The UBA**, with respect to the future and the measures it recommends to cope with the risk of drought, states somewhat verbosely: "Also conceivable is a separate agreement on the reduced use of water for regulated consumers." In plain English: Your backyard oasis could dry out soon, and bans are probable. A little later, "demand-based pricing models" are addressed for steering the use of water. Translated this means: Drinking water will cost more. In many places, groundwater is the primary source of drinking water, so it should be used sparingly and not for irrigation. Rainwater, on the other hand, is excepted ...

**Rainwater collected in GRAF tanks does not cost anything.** And if you have it, you may also continue using it to preserve the green you love so much in your garden. The water remains within the cycle. And because it remains in the cycle it does not deplete drinking water

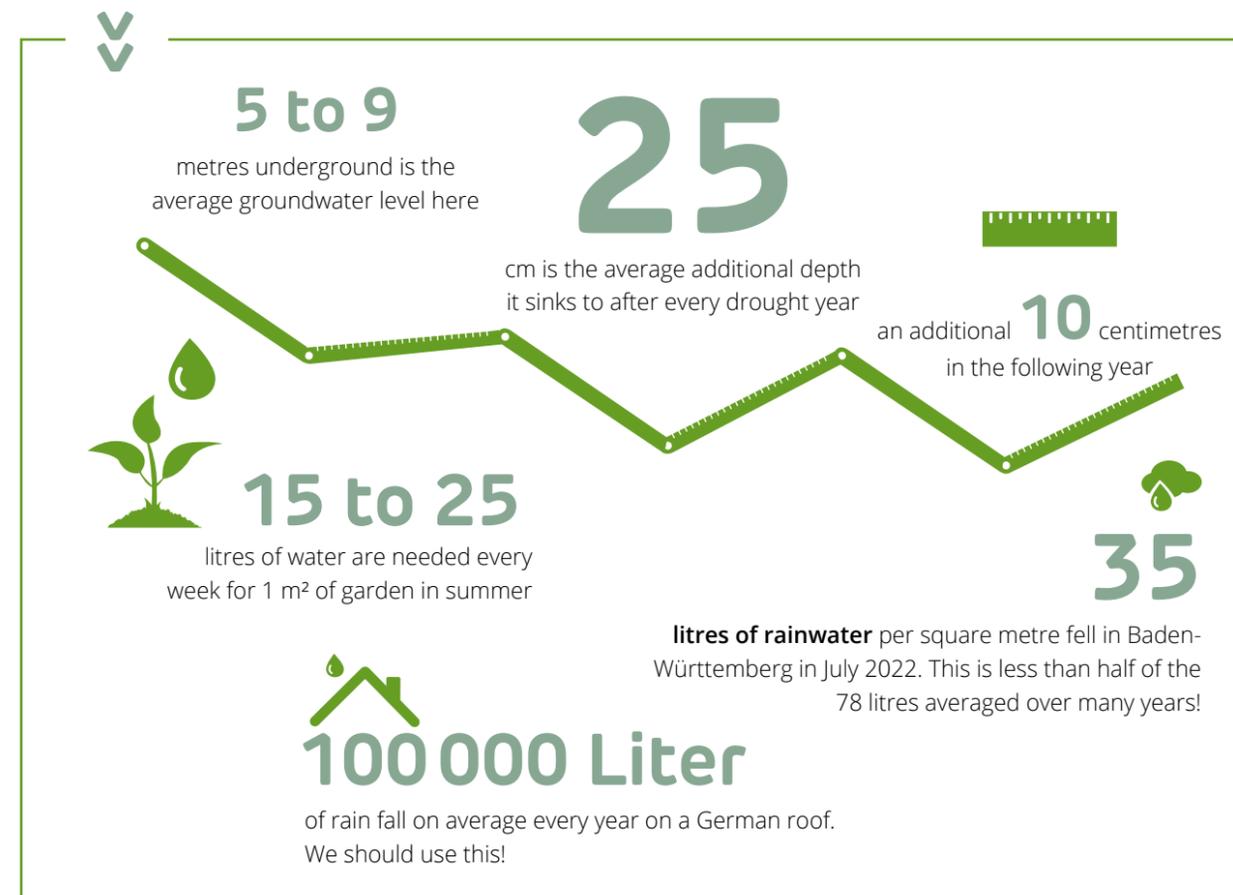


Photo: Otto Graf GmbH. Illustrations: www.stock.adobe.com / Daniel Berkmann, Olga Sh, alekseyvanin

Source: Statista

resources, but is added to the low levels especially when needed in the hottest phases. In any case, the indefensible alternative is to let valuable rainwater run off impervious surfaces like roofs and paved ways and directly into the sewers. On the other hand, the precipitation harvested in these areas provides double the benefits – for the garden and for the water balance. Also the UBA report cited above appears to treat the improvement of watering efficiency as part of the solution. The higher the water level in the storage tank, the lower the costs for tap and stormwater. Yet another good reason for harvesting rainwater ...

**In 2022, KIT and the** Federal Institute for Geosciences and Natural Resources (BGR) published a study that applied AI in calculating models for predicting the future trends of

groundwater levels. Their conclusion is as follows: "Groundwater levels will continue sinking inexorably when no proactive measures are taken to limit its extraction, contain irrigation, or augment its replenishment from infiltration."

Yet the good news is: we can contribute towards a water balance that is healthier than forecast by the models in the study. To date, these models take no account of constructive human endeavour. Replying to our request, Andreas Wunsch at KIT, coauthor of the study, replied: "We can take countermeasures." He continues: "The most important measure to this end is the mitigation of climate change – and then the more-pessimistic scenarios may not arise at all." And mitigation of climate change here also means: a sustainable relationship with precipitation.

PHOTOS: JIGAL FICHTNER · COPY: VERENA VOGT

# Why plants love rainwater

Tap open and away you go: Many owners use tapwater for their gardens all the year through. Yet a far better alternative simply drops out of the sky, regularly and free of charge – and expert gardener Christian Jäger is well aware of this

*»If we could do without wellwater, we could make an important contribution for the environment«*

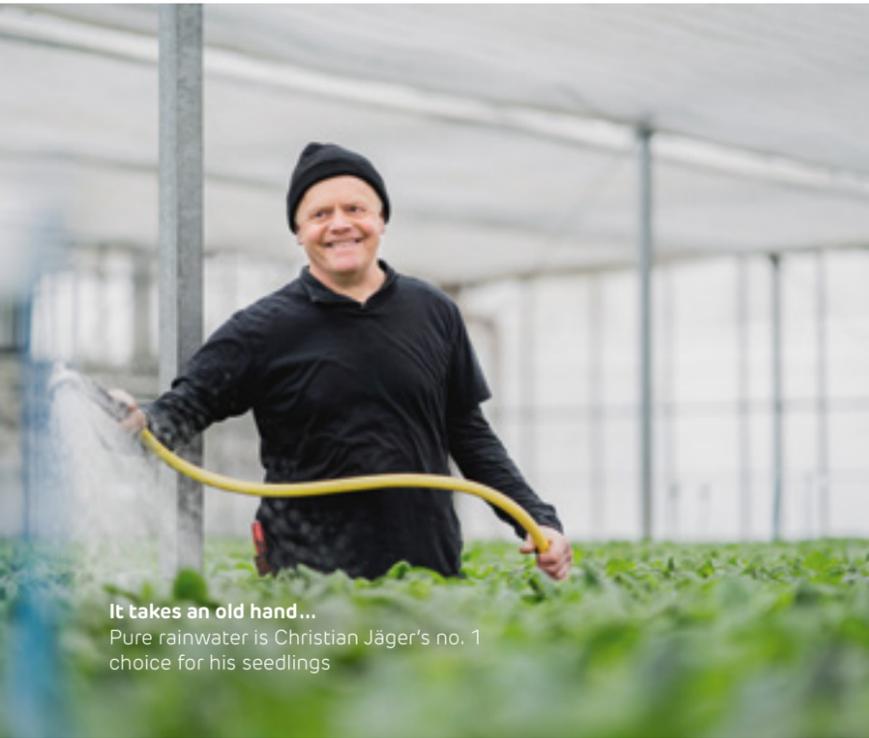
The expert with the green fingers grits his teeth every time he sees dark clouds gathering in the sky. And not because Christian Jäger has anything against rainy weather. On the contrary. An expert gardener can scarcely conceive anything better than thousand of litres of water dropping on his garden free of charge. Yet Jäger must watch on, powerless, each and every time this invaluable resource flows over the roofs of his greenhouses in Baden's Ettenheim – and straight into the sewers. And the reason? His present capacities in the form of GRAF tanks can take up only a limited quantity of rainwater, and the rest he needs to water his garden he has to draw from a well.

Jäger sees in this a huge disadvantage. "Well-water costs money because we have to buy it from the authorities – and we need a huge amount of it." Even amateur gardeners using tapwater have felt the spiralling costs in a hot summer. The switch to rainwater of course necessitates investments in tanks, piping, and pumps, but Jäger has already done the maths: "We have these costs by using wellwater anyway".

**Where rainwater scores** – In addition, well and tapwater are of inferior quality – at least from the plants' point of view. "In comparison, it's very hard, it's limy, it has a relatively high salt content, and increases the pH value in the pot," explained the expert. He also tells of problems caused in a number of cultivations. Rhododendrons, for instance, react very sensitively to high lime content. "We can handle that, but rainwater is simply the better choice for the plants," he concluded. Although confirming that rainwater reduces the pH value in the pot, he admits: "To be perfectly honest, I prefer using rainwater in its natural form – just as it falls." And incidentally gardeners opting >>



**Only the best for our gardens**  
Manager Christian Jäger plans soon to dispense with wellwater altogether



**It takes an old hand...**  
Pure rainwater is Christian Jäger's no. 1 choice for his seedlings



**Green and clean**  
Rainwater doesn't leave unsightly lime streaks on the leaves

or flat Platin tank that needs minimal soil cover, for the corresponding savings in installation costs. Christian Jäger also chose a number of years ago to have a 5000 l GRAF rainwater tank installed under one of his greenhouses – including water sockets. This collects, recirculates, and reuses excess irrigation water, and so eliminates any additional charges in the open soil.

**Jäger proudly opens** the grass green cover on the dome shaft, and we hear the splashing of water from a pipe some metres down in the dark. An elaborate system adds nutrients to the water collected here, sprays it on the nursery plants, and routes it back into the tank. Elsewhere in the garden centre is another GRAF tank that, according to Jäger, has been there for 25 years, and is still operating as well as it did on the very first day.

Today the total rainwater capacity owned by the gardener amounts to 30,000 litres – but that is far from enough, Jäger confesses, especially in the summer months. So Jäger has long been planning to purchase another two GRAF tanks carrying 50,000 litres each. He is convinced: "We could then dispense with well-water altogether for nearly the whole year, and make an important contribution to preserve resources." And then the sight of gathering rainclouds may finally conjure a smile on his face ...

>> for rainwater needn't worry any more about pH values. "Our soils have so many free lime reserves, they can balance it all out easily," said Jäger. He advises occasionally adding small quantities of lime or physiologically acid fertilisers when watering house plants.

Last but not least, rainwater also scores, as a matter of fact, from the aesthetic viewpoint when compared with tapwater. "When we water our plants with wellwater directly from above, it leaves an unsightly lime coating on the leaves," explained Jäger – which no doubt can be confirmed by the one or other plant pot gardener. "Our customers then ask us if the plants are ailing or we treated them with something bad." Jäger stressed though that he and his team attach the greatest importance to restricting their use of herbicides to the absolute minimum.

**A growing number of people with gardens** now know about the advantages of using rainwater and are harvesting it in butts. In addition, GRAF offers a number of options installed underground, for instance its underground Carat

**Whiter than white –**  
You don't need costly drinking water to wash your clothes



Photo: www.stockadobe.com/ Carola Schubert

COPY: ANNIKA SCHUBERT

# Clean and green

Washing clothes with rainwater? Not a problem!  
The quality of water dropping for free out of the sky is ideal

Whereas drinking water in Germany is subject to stringent regulation, rainwater on the other hand raises the question: How clean is it in actual fact? First off: rain is the most natural thing there is.

**Rainwater from properly installed harvesting installations** is therefore clean and a valuable resource. According to studies, rainwater is not only clear, colourless, and odourless, but is also free of turbidities, solid matter, and biofouling.

It is also very soft (less than 2 °dH) and has a relatively neutral pH value (about 5.6). Where aesthetics and hygiene are concerned, it is therefore ideal not only for watering gardens and flushing the toilet, but also for washing clothes. And there's more: because of its low lime content, it doesn't need a decalcifier or water softener. And it also needs

up to 60% less detergent – and that saves money.

**Yet another two advantages for savings: First, machines drawing rainwater live longer!** Secondly, according to GRAF calculations, just washing clothes with rainwater helps a family of four to save up to 20,000 litres of drinking water a year!

**And the clothes? They feel smooth and silky** thanks to lime free rainwater. The lime contained in drinking water acts like an abrasive on the fibres in textiles. Soft rainwater, on the other hand, penetrates deep into the fabric, for gentle washing and softening effects.

**Rainwater for washing clothes** is provided by GRAF complete packages with integrated multistage cleaning for maximised rainwater quality. Clean and green.

**Clean rainwater for home use**

Want to know more about rainwater used at home and GRAF's rainwater filter systems and multistage cleaning? Go here:





**Saving water, systematically**  
And it can be fun, too. Full cistern ahead

PHOTOS: BENEDIKT SPETHER · INTERVIEW: THOMAS GLANZMANN

# Why harvesting rain is always a good thing

Rainwater is not only good for the garden, it's also good for your pockets. Our expert Dr Walter Kolb explains the whole concept, and how best to approach it

Dr Walter Kolb is a champion and pioneer of rainwater harvesting and has dedicated to saving water in the garden no less than a whole book, his "Wasser sparen im Garten". Intending to utilise the rain falling in his own garden, this landscape architect, future author, and departmental head of a state authority found himself in a running battle with government agencies – and built his own cistern without further ado. In this interview he explains why harvesting rainwater is a matter of honour for him, how it works, and what you have to watch out for.

**Dr Kolb, just supposing I have a house and garden, just how important is the subject of irrigation to me?**

First of all you should identify the forms of vegetation you have in your garden. For instance, if you have plots set aside for vegetables or summer flowers, you can safely assume you need to water them. And you have to take account of the soil consistency. Lean, sandy soils retain water for a short time only and so need more watering. All this you should know as a home owner.

**You mean, if I'm lucky, my garden gets enough water from rain anyway, and everything's fine?**

In high-rainfall areas, you may need not water at all in some years. Yet even there, a dry period with high temperatures cannot be ruled out completely in the summer – and the heat-waves are growing worse. High rainfalls are of no use to plants in autumn and winter when there's been a water shortage during the growing season.

>>



#### Watering flowers

... one use for rainwater – but by no means the only one

#### >> When I start collecting rainwater, what benefits more over the long term: the environment or my pocket?

Over the long term, your pockets too will always feel the benefit, a benefit you can start utilising today. Water rates are rising because safeguarding the utilisable groundwater reserves involves considerable costs that the providers then pass on to the consumers. The benefits for the environment consist in the preservation of the groundwater reserves and

the cooling capacity for heated city structures. And that's growing in importance. Yet there are also other good reasons: When unused rainwater drains away quickly, it poses an additional load on the sewers and clarification plant. In particular storms, and their frequency is growing constantly, lead to flooding. Cisterns and infiltration systems offer a remedy.

#### Yet setting the garden aside, where else can you use rainwater?

It's not only good for irrigation, it can also be used in toilet flushes, washing machines, garden ponds, and swimming pools – and saves valuable drinking water to boot. As you can see, rainwater is not reserved for the garden alone.

#### So what amount of spending money are we looking at?

That depends on the local conditions and the size of the grounds. Simple water butts come quite cheap. A decorative rainwater collector carrying 300 litres will put you back 100 to 250 euros, though. A 5000 litre tank you can have for 2000 euros. And then you have all the surrounding equipment, for instance an all-inclusive garden package for under 3000 euros, plus installation.

#### Butt, tank, cistern – what are the benefits of each?

The butt is small and relatively cheap, but offers only a very small capacity. This is the solution for small roof areas and low water needs. Tanks and cisterns can be expanded to meet higher demands. They are generally installed underground and so save a lot of space.

#### What are the criteria for deciding on a particular system and an appropriate capacity?

What's important is the drained roof area, the expected annual rainfall, and the quantity of water you need (this can be calculated on the GRAF site at [www.graf.info/tankberater](http://www.graf.info/tankberater)).

*»Rainwater's not only good for irrigation, but for the washing machine as well«*

#### How do I know how much I need?

According to calculations, the growing seasons of intensive crops like cucumbers, pumpkins, and other vegetables needing a lot of water need a good 30 to 60 litres per square metre of open field, and utility lawns and shrubs 10 to 25 litres. And this, of course, depends on the naturally occurring rainfall. These figures can be less when the areas are mulched or shredded.

#### I can still remember granny's old water barrel in her garden ... it was a breeding place for midges and other creepycrawlies. And in high summer the water stank. What's your simple, practical tip?

All that is not a problem for closed rain barrels.

#### You yourself have gained experience from your own system that even supplies water to the toilet flush. How does that work, and what do you need to watch for when piping this water into your own four walls? >>



## What's important – an overview

The interview with Dr Walter Kolb has made it clear: utilising valuable rainwater is always worth while. The following points must be noted and serve as a checklist for rainwater fans



### Forms of vegetation

You should first identify the vegetation and the consistency of the soil. All these play a role in determining how much water you need.



### Now to the roof

Classical water butt or underground cistern? This also depends on the drained roof area.



### Calculations versus area

Open field with vegetable crop = 30 to 60 litres per square metre; lawns and shrubs = 10 to 25 litres per square metre.



### Swale done!

And if you want to take a proactive role in promoting the replenishment of groundwater, infiltration swales are your best choice.



### What else can be used?

Washing machines and toilet flushes, for instance. Yet you'll need a second water circuit and pump in your home.



### This way!

The GRAF tank consultant is your quick and simple solution for calculating the tank size you need.



**Walter Kolb** <sup>^</sup>  
Landscape architect and former head of the LWG (Bavarian State Institute for Viticulture and Horticulture) landscape conversation department

>> Your home will need two separate water circuits: one for service water, and one for drinking water. The service water circuit will need an automatic pump. And this has been working for me at home for 30 years, just so – without problems.

**What was for you personally the deciding point when you switched to this system – and started a running battle with the city council, as we hear?**

I had a large garden that needed lots and lots of tapwater. And it riled me that I had to pay efficient fees on top. That's why I built the cistern for us. According to the then local statutes, I was forbidden from doing so. Today, the community is even promoting the building of these systems. An encouraging turning point in our

history I find.

**We have now talked quite a lot about collecting and utilising rainwater, but what else can I do to establish a working rainwater management system in my garden? For, as you yourself said, it also affects the groundwater level ...**

Precisely. To wit, the infiltration of rainwater can promote the replenishment of groundwater. And it works like this: Infiltration swales clean and transfer the rainwater directly over their surfaces to the subsoil. Infiltration ditch elements then collect the water before letting it seep slowly into the subsoil. In all cases, therefore, a good way of counteracting the problem of sinking groundwater levels.

Photo: private. Illustrations: www.stockadobe.com



**The GRAF project team >>**  
Team leader Manuel Kromer (3rd from left) and his team provide active support in the planning and realisation of GRAF solutions

Photo: Otto Graf GmbH

COPY: STEPHAN FUHRER

# The doers at your service

Advisers, problem solvers, go-get-downers, there are many names that fit Manual Kromer's team. Their knowledge brings projects to their goal

Be perfectly honest now: who among you, doesn't deal with this subject every day, knows how deep the soil cover has to be on an underground tank? Who issues permits? How much does special transport costs? You see? These and many other questions (and their answers) are the speciality of Manual Kromer and his team. "We are, so to speak, a solution service provider, no matter where the requests come from," replied the team leader when asked about his assignments. Requests are restricted not only to specialised dealers, also architects, planners, and underground and geotechnical engineering firms have the one or other question. "We come in when our partners need the answers to more than that covered in our technical catalogues and extensive download area."

**And what's also good to know: this service is completely free of charge.** And – This is not about direct dealing. Kromer: "Our Num-

ber One contact is and remains the specialised dealer in construction materials." Instead, these services are to provide unconditional support to all involved in the planning stages of their respective projects. "In the case of rainwater infiltration, for instance, the first step is to evaluate the geological and local conditions: are these at all amenable to infiltration, or does rainwater retention present the better alternative?" he explained. Alternative solutions are explored with measurements and calculations. "In addition, we can also elaborate a binding offer with installation drawings and all relevant BOMs."

A number of interesting examples are presented on the following pages. Frequent are the cases when the GRAF experts supervised the realisation until the very end. For Kromer, there is one thing above all else: "It is our job to find for our partners the best technical and business solution."



**France – An expanse of infiltration ditches for Isover**

In Orange in the south of France, at the site of the insulation specialist Isover, GRAF delivered 42,200 EcoBloc Inspect smart modules for a composite-block rainwater retention system with a total capacity of 9029 m<sup>3</sup>. The gigantic Isover storage and logistics building covers an area equalling 11 football pitches, and must be drained with the corresponding efficiency. EcoBloc Inspect smart infiltration ditch modules are made entirely of high quality, premium recycled material prepared by GRAF itself – the reason that Saint Gobain decided in favour of GRAF.



**<< Panama – Clean treatment**

This project in Panama involved GRAF tanks in a self-sufficient wastewater treatment plant for a settlement of about 1,000 persons in 250 housing units. Installed underground, these tanks buffer and treat wastewater. Designed for optimised logistics handling, Carat S tanks consist of two half shells that are first assembled into a tank on site.



**✓ Austria – XXL on the Danube**

Arbing on the Danube in the Austrian district Perg is home to a concrete factory set up by Hasenöhrl. Its central elements are two GRAF tanks – a Carat XXL of 112,000 litres and an adjacent Carat XXL at half the size (56,000 litres). The water they store is needed to manufacture concrete. In this case, groundwater is pumped continuously into the tanks that then dispense it when needed.



**<< Kuwait – Infiltration plant in the desert sand**

South al-Mutlaa, 400,000 residents, 12 suburbs, 28,363 buildings – By 2023 the desert sands of Kuwait will have witnessed the emergence from nothing of a whole city together with its infrastructure – and infiltration installations from the modular system EcoBloc maxx. It is the country's largest construction project, and the largest order ever for GRAF. Around 1,000,000 EcoBloc modules with a storage capacity exceeding 200m litres have been assembled in this megaproject. Their purpose is to retain water that cannot drain away fast enough on the dry desert soil after unexpectedly heavy rainfalls.



Photos: Otto Graf GmbH



#### << Building site from the air

The GRAF EcoBloc Inspect modules were assembled on site into a multi-layer combined block in just 2½ working days

underground retention systems comprising a good 1400 GRAF EcoBloc modules – and a total net holding capacity of 585,000 litres. The original plan was to let the rainwater infiltrate through the site of the new premises, but the clayey soil proved unsuitable, and new soil would have meant huge delays, not to mention the additional costs. After commissioning a soil expertise, ATP München Planungs GmbH, with the approval of the local water authority, therefore decided to retain the rainwater and afterwards discharge it through a throttled outlet into the sewers. A practical advantage of GRAF EcoBloc modules is their suitability for both infiltration and retention, so only minor changes had to be made to the plans.

PHOTOS & COPY: GRAF

## Thought ahead

Schaltbau's NExT factory is going new ways in sustainability. A key constituent of the developer's far reaching concept is rainwater management as provided by GRAF

In recent months Velden by the Vils witnessed the emergence of one of the most modern production locations for switch cabinets which has now commenced operations. But that's not all. The planners of Schaltbau's NExT factory were not only concerned with efficiency, but also prioritised their environmental awareness in their work. The final outcome is not only the realisation of a CO<sub>2</sub>-free energy concept, but also a particularly sustainable solution for rainwater retention – which couldn't have been more fitting in the face of the onsite situation. Installed on the company premises were three

**The GRAF rainwater retention system exhibits a modular design.** Its capacity and above all its length, width, and height can be adapted separately to the local conditions for the maximum possible utilisation of the available space. In Velden there are three rain retention systems in total installed under the park and road declivities (2.6%) where they can withstand loads of up to 30 HGVs. The first rain retention installation takes up the water from a flat roof covering a good 4,200 square metres plus 195 square metres of paved surfaces. Installations 2 and 3 receive the >>

**For this project,  
the modules were  
assembled on site  
into a multi-layer  
combined block in just  
2½ working days**

>> precipitation from other roof areas equal to a good 11,500 square metres and from paved and unpaved areas exceeding 3,000 square metres. The supply lines connected to the rain retention systems range from DN 250 to DN 400. A number of throttled outlets discharge the water in controlled doses totalling 26.5 litres a second into the combined wastewater sewer system. The installation makes use of the 66-cm-high GRAF EcoBloc Inspect module that has been fitted in Installation 1 in the form of a single-course combined block covering a base area of 17.6 × 15.2 metres. This was dictated by the local conditions, more specifically that this combined block is arranged like a staircase in triangular form. The net capacity is a good 137 cubic metres. The retention installations 2 and 3, on the other hand, could be arranged in the standard rectangles, each 55 m long by 13 m wide for a total net volume of 448 cubic metres.

In the version with 420 litre capacity the GRAF EcoBloc Inspect module corresponds to the usual plane grid of 80 by 80 centimetres. The module is made of 100% recycled plastic and has a minimum rated service life of 50 years. The modules are also designed for inspections by means of customary DN 200 cameras: developers can then keep a constant eye on the building progress. For this project, the modules were assembled on site into a multi-layer combined block and afterwards enveloped in geotextile in just 2½ working days. In a second step, this inner layer was fused to a non-water-permeable 2 mm HDPE plastic liner. In a third step, the infiltration ditch was again wrapped with the geotextile.

The advantage of this three-layer structure is quickly explained. On the one hand, it prevents the uncontrolled discharge of water from the modules. On the other, the inner textile sheet protects the HDPE plastic from possible damage on the infiltration ditch's edges. Finally, the outer geotextile serves as a protective layer for the system.

**The EcoBloc composite block** for the three rain retention installations houses 21 GRAF Vario 800 shaft systems. These serve as inspection and flushing shafts. In the GRAF Vario 800 system, one element of the shaft system is precision fitted in the EcoBloc composite block. The shaft systems were pre-assembled at GRAF specifically for this project and delivered ready for connection. This saved time during installation and facilitated commissioning on site. The telescopic shafts are designed for loads of up to 30 HGVs.



#### ^ Adaptable

The modular system makes the rain retention installation customisable to the local conditions for the maximum possible utilisation of space. Whether as a U, an L, or, like here in Velden, a kind of triangle.

#### << Getting there faster on site

The shaft systems were pre-assembled at GRAF specifically for this project and delivered ready for connection.



PHOTOS &amp; ARTWORK: UFZ · COPY: IMKE ROSEBROCK

# Stay right there!

Discharging rainwater into the sewers? The sponge city prefers local storage. Professor Roland Müller at the Helmholtz Centre for Environmental Research (UFZ) in Leipzig explains how cities can optimise their water cycle and so prepare themselves better for climate change

»Rainwater in cities poses complex challenges that we shall have to start tackling today rather than tomorrow«

All over the world, urban spaces are struggling with the consequences of climate change. Here, extreme weather events are forcing municipal infrastructures up against their limits, threatening the health of the people, polluting the environment, and causing considerable costs. Professor Roland Müller, biotechnologist at the UFZ in Leipzig, carries out research in ways of adapting the local water cycles of cities to the new challenges. What it needs? More decentralised solutions. Yet above all, immediate action ...

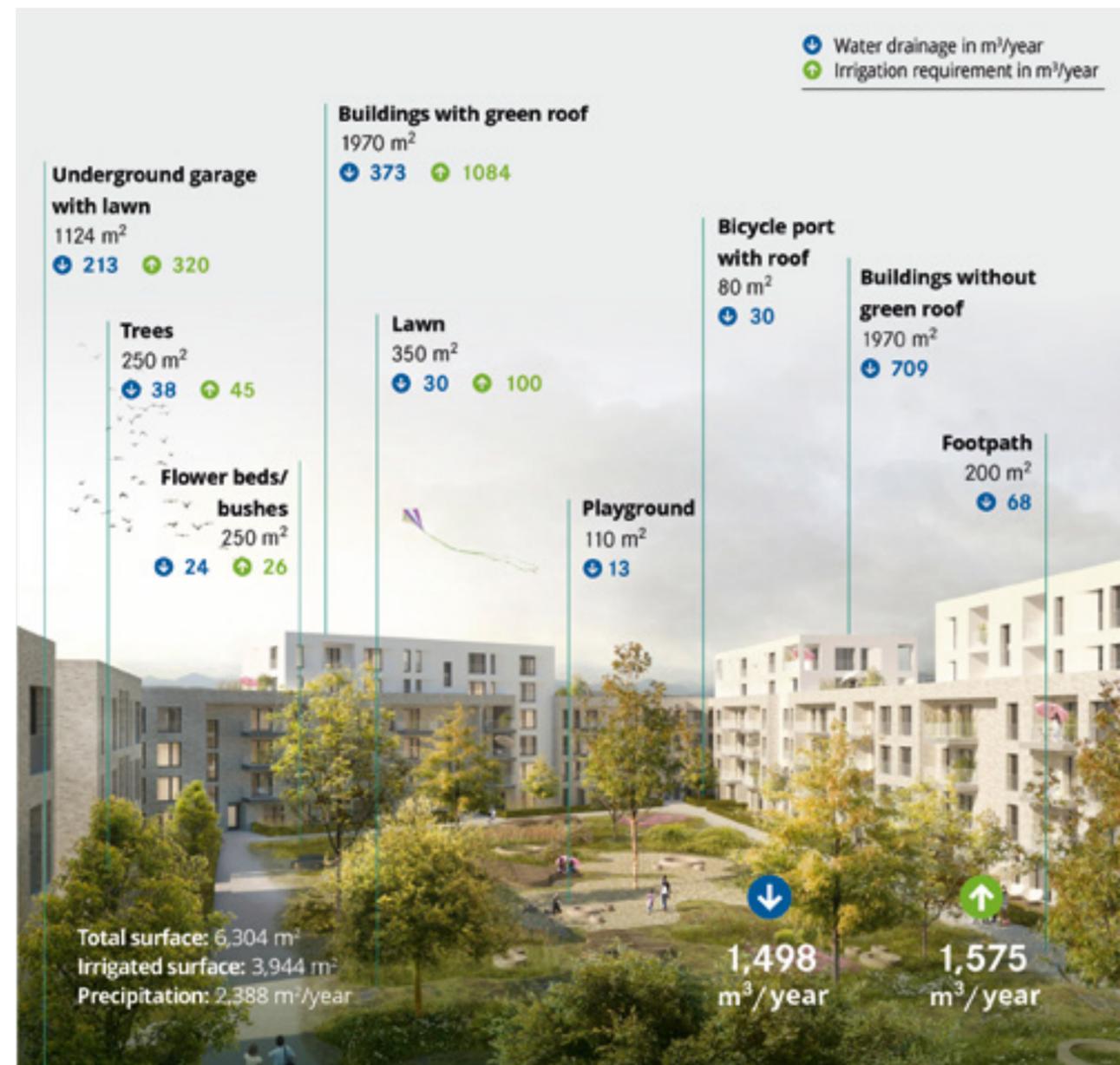
**Professor Müller, what challenges will the cities be facing now we're talking about rainwater?**

Water is both a blessing and a curse. On the

one hand, climate change is increasing the frequency of storms, and therefore the load on municipal infrastructures. This applies likewise to heatwaves and dry seasons that impact a city's green areas, the quality of our lives, and even the health of a number of demographic groups. We must make it our goal to store precipitation in times of excess, and to provide this water in times of shortage. Urban planners must respond to this, adapt their water management, and make the cities fit and resilient. A complex challenge that we should start tackling today, not tomorrow.

**Time's running out therefore. Can you suggest any measures that can be taken quickly?**

We are speaking here of a collection of technologies that we collate under the heading of blue-green, multifunctional water infrastructures. They're multifunctional because they have more than one effect for the city. One classical example is the green roof. It can store rainwater, which then evaporates gradually to improve the microclimate. Or it can pipe the water to the inner courtyard, where it is stored in tanks or infiltrated for replenishing the local



groundwater levels. This roof type also exerts an insulation effect benefiting the storeys below. In addition, the vegetation reflects light – at least when the green roof is ecologically healthy, i.e. it is green when it should be: in summer. In backyards too, water can be stored permanently in cisterns or buffered and infiltrated in ditch and swale systems. And we must also integrate the green infrastructure, i.e. trees, parks, etc., for instance in the form of tree infiltration ditches. The solution therefore can be provided by decentralised rainwater infrastructures capable of adapting a city's water cycles to specific climate conditions and local particularities.

**These measures are made up of many different parts – what effect can we expect from them?**

Heavy rainfall, which today disappears in the sewers, quickly forces them to their maximum capacity, and flooding and overflowing are the result. By providing many small, decentralised storage and infiltration facilities, I'm counteracting these peaks and therefore lowering the risks they involve. In actual fact, whole districts today can be disconnected from the public sewers, and precipitation water remains in these districts – and all this with relatively little technical expenditure. That's the charm of planning with these systems of many small >>



## Sponge city – Sponged down!

Rain falling on buildings, carparks, and paved roads lands for the most part in the gutter and is transported to the city gates – in retention basins, treatment plant, and rivers. In other words, the spreading imperviousness of sealed surfaces is disrupting the natural water cycle in the cities. Flooding and summer heatwaves are the frequent consequences. In a sponge city, therefore, urban planners intend to modify the local infrastructure and create natural reservoirs for rainwater.

For instance, the new Leipzig 416 district is currently emerging on the former premises of the Eutritzsch rail depot. Cofunded with a good 2.8m euros by Germany's Federal Ministry of Education and Research (BMBF), this model project intends to create a sewageless, resource-efficient city district. The targets include relieving the load on the sewer system, improving the microclimate, and facilitating resilient stormwater management. Those involved intend to explore the potential not only of multifunctional water infrastructures, but also new communication and decisionmaking concepts between the actors from communities, science, and private sectors. In overall charge of the project is the Helmholtz Centre for Environmental Research (UFZ) in Leipzig.

>> parts. According to model calculations, we can retain about 90% of the water from a 30-year rain event. When extrapolated over the whole city, this gives rise to huge design potential, alone when only 10 to 20% of districts should disconnect from the public sewers.

**Yet first and foremost, our transformation into a sponge city will cost a lot of money, money that the communities don't necessarily have in abundance...**

And even if the cities do nothing, costs will still increase. Eliminating the damage caused by climate change may entail considerable sums. Alone here in Leipzig about 2,000 trees died of heat stress in the dry years 2018 to 2019.

**So has this issue already arrived in full force at the responsible authorities?**

By and large I should think so. More and more cities are declaring a climate emergency and are beginning to think and plan with a high level of water awareness. And there are a number of publications, such as the BMUV's "Nationale Wasserstrategie" and other handouts, that the city's politicians should now be familiar with. I'd be really surprised to learn that the cities, the councils, and the environmental authorities are not reading these. Infact, and I'm putting this bluntly, they are required reading.

**Yet politics alone can't set it all right, can it?**

There must be new planning and communication structures, and more people involved around a common table: the various agencies, planners, and investors. Specifically the build-

ing associations and the cooperative building societies, which own up to 30 or 40% of the cities' residential areas, we see as key partners in the transformation of cities. So that not only new buildings, but also renovated stock can benefit from more of these water awareness measures. I believe that much can be done by regulation and ordinance, and also by incentive systems and subsidies, as they are known from energy-saving renovations. We see that especially in major cities there are investors and building associations who are more than willing to go new ways.

**After all, urban planning prioritising water awareness also needs a certain level of know-how before it can start wording e.g. bids for tenders, regulations, and plans. Where can that be obtained?**

Smaller communities often don't have the capacities to approach and realise all that. Here too, major cities could demonstrate how it is done, and smaller municipalities can benefit faster from the results. Moreover, there's a little knowledge available from Germany's model projects for sponge cities. As the scientific supervisor of the Leipzig project, for instance, we hosted a number of events and measures that reached about 1000 community representatives. Of course, an urban transformation on this scale is not expected to take place from one day to the next. Nevertheless, we should start as soon as possible to realise this water awareness policy on the district or residential block level. The cities, the authorities, the companies, all continue learning with every project completed, and that's important.

*»We should start as soon as possible to realise a planning policy prioritising water awareness. The cities will then continue learning from every project«*

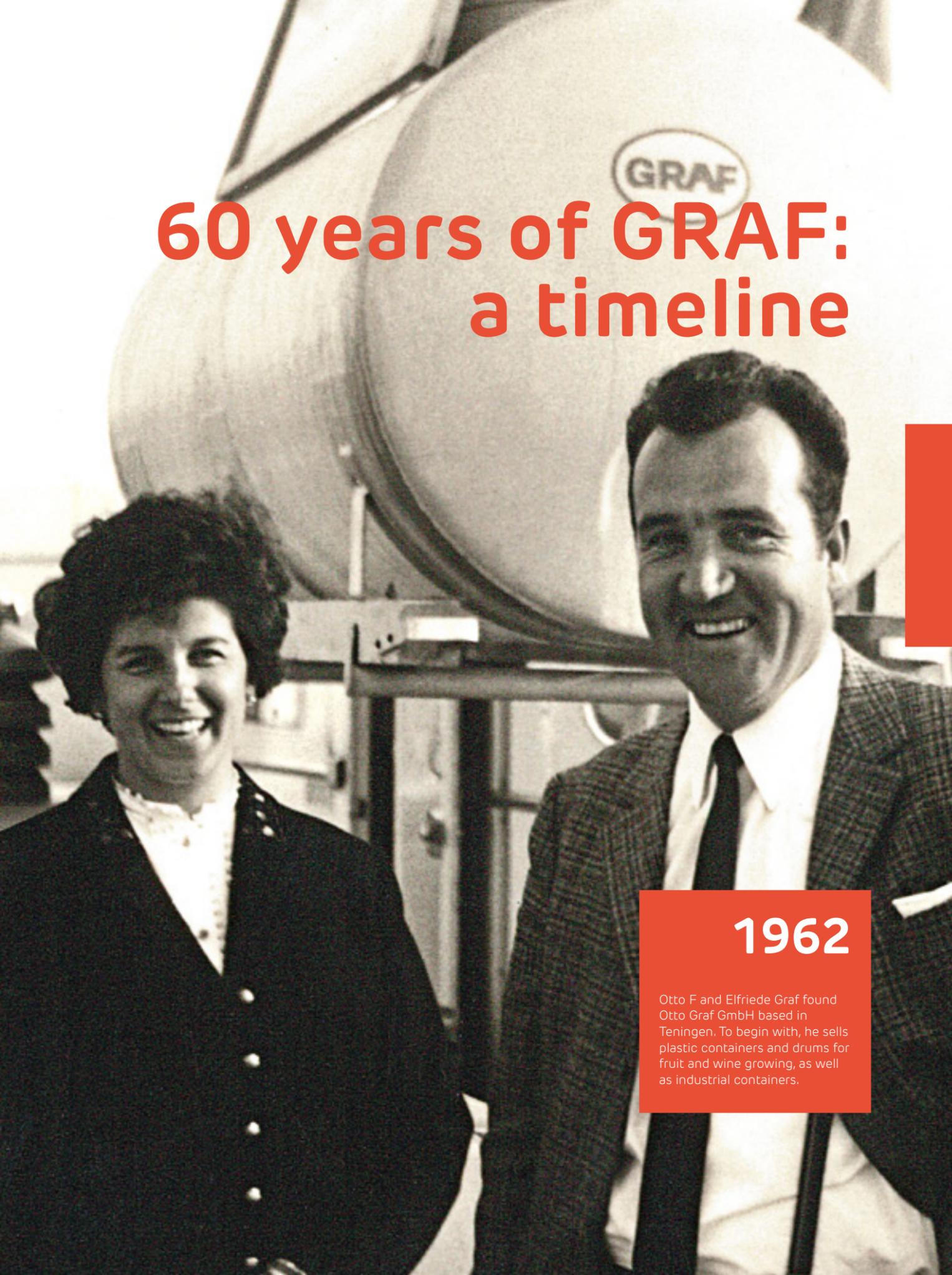
**How can science promote the transformation of cities? Can you even affect this directly?**

We must continue ahead with model districts and cities. One goal is to utilise digital data platforms for the better mapping of actual situations and for providing answers to the key question: How much water does my city need? That may sound trivial, but it isn't. You see, in order to answer this question, I need a plethora of local information: precipitation quantities; groundwater reserves and utilisation; irrigation needs; as well as definite vegetation types in the city both today and in the future. Major cities now have 3D GIS systems that I can consult for the sites of flooding and expected heatwaves and the maintenance levels of sewers and individual residential blocks. It is my hope that we can map the cities as functional digital twins in perhaps 5 to 10 years and use the data they provide to run through the various scenarios – and so simplify the decisionmaking process.



^ Professor Roland Müller is the head of the Centre for Environmental Biotechnology (UBZ) at the UFZ in Leipzig

# 60 years of GRAF: a timeline



**1962**

Otto F and Elfriede Graf found Otto Graf GmbH based in Teningen. To begin with, he sells plastic containers and drums for fruit and wine growing, as well as industrial containers.

**1970**

## First foray abroad –

GRAF founds a French sales branch in Alsace

**1978**



## First rainwater tank

The French GRAF subsidiary relocates to its present site in Dachstein, Alsace. There the first GRAF rainwater tanks are manufactured on a rotary machine



**1996**

**1998**

## Next step

GRAF launches the first generation of its percolation blocks – the foundation for its rainwater infiltration and retention portfolio



**1974**

## First rainwater barrel

GRAF lays the foundation stone for the future and launches its first rainwater barrel, the core product of its rainwater harvesting line



**1990**

A possible record – At its French location, GRAF starts operating the largest rotary machine in Europe



**1997**

Revolution in tank logistics – The Herkules tank consists of two half shells joined by means of a patented system

A second production site is set up in Teningen. The new plant building is home to one of the world's most modern manufacturing facilities for plastic products

2006



Nice one mate! – GRAF Sales launches in Great Britain and Australia. In Teningen, production is expanded with blow die installations

2008



**Particularly innovative!**

GRAF receives the first prize from the German Federal Ministry of Economics and Technology for the project "Developing welding technologies for large-volume plastic containers".

2013



GRAF joins forces with Wilken Plastics Energy GmbH in Emsland, consolidating its commitment to recycling raw materials. Also in 2018, GRAF sets up Ireland Environmental Ltd

2018



**Neuried**

GRAF inaugurates a new plant designed specifically to produce XXL tanks with capacities as high as 122,000 litres. More on the following pages...

2022



2002

The GRAF column tank is ready for the market. The company has now gained a foothold in the segment of decorative water containers, today an important part of the GRAF portfolio



2007

The Carat underground tank enters the range, the basis for expanding global export activities. In the same year, GRAF sets up a sales branch in Spain

**And the winner!**

Otto Graf GmbH is awarded the Baden-Württemberg regional innovation prize

2010



2014

After years of collaboration, GRAF takes over Klaro GmbH, formerly a partner in the field of decentralised wastewater disposal. Also the British company SCP Water Management Ltd has now joined the Group under its new name GRAF UK Ltd

**Graf acquires the Polish firm Sotralentz**

This serves to expand the expertise for decentralised wastewater disposal and consolidate its own position as a leading provider of water management systems

2017



2020

**Herbolzheim**

Inauguration of the Competence Centre for Raw Materials, which will be transforming waste as a secondary resource into high quality recycled material



## 2022

The new plant in Neuried manufactures XXL tanks – and GRAF turns 60! And a welcome opportunity to recall the beginnings...

PHOTOS: BENEDIKT SPETHER, ARCHIVES · COPY: ULF TIETGE

# From errand boy to entrepreneur

In California, firms are set up in the garage, in Baden-Württemberg in the backyard barn. Company founder Otto F Graf tells us how Count Keg evolved into Europe's Rainwater King

Brainwaves often come when least expected. For instance, on holiday. The Graf family are still sitting at breakfast in a Swiss chalet when it happens. "I was actually only playing a little with the yogurt pots," recalled Senior Partner Otto F Graf. "I was just turning and stacking them over and around when I suddenly thought, that's the way you have to build a tank! And that idea just happened to give rise to the Herkules tank and its two shells. An upper segment, a lower segment, and so shaped that the two can be stacked inside each other." That was in 1996. At that time his originally small-scale dealership had already evolved into an SME, but the major breakthrough ... that was still waiting to happen.

"The yogurt pots really did have a crucial role in it all," recalled the company founder with a grin. The new design of the Herkules now meant that a truck could carry 50, instead of only 5 of the former tank designs.

"All with 1600 litre capacities. This revolutionised tank logistics and also provided the basis for our current export leader, the Carat S tank." But perhaps we should simply tell the story of Otto Graf from the beginning ...

**"My parents ran the guesthouse 'zum Hirsch' in Emmendingen,"** he commenced. A cook, then? "I wanted to set things in motion, be my own boss." And so Otto Graf became apprenticed to an ironmonger immediately after his secondary education. "Not exactly full of thrills," he mused.

On commencing employment at an ironmongery wholesaler, young Otto first moved to Schwetzingen (again as a salesman), then to Wuppertal. "To the Eisenwarenfachschule, a college for ironmongery usually reserved for the sons and daughters of company proprietors," he explained, and we can see how this station with the weekly inspection tours has >>



### Classy wheels!

In the 1960s the boss himself was delivering to the vintners, with a trailer hitched to his Citroën DS

>> moulded him. "I did it because I wanted to be the best in my profession. It was also interesting because we got to know all kinds of materials, including all of the different plastics and production methods."

**After college:** back to Emmendingen. Back to living with his parents. "It was simply cheaper," he added and explained how it was for a field worker: away mornings, visits to customers, back evenings, return company car, and home by scooter. That earned him 350 marks a month – not bad at a time when a ticket to the cinema cost 1.20 marks – but great leaps can't be made all at once. So Graf moved again. To Sick in Emmendingen, then doing a roaring business with winemaking machines. The young man travelled all over the Federal Republic, learning about the world of vintners and cellarers. "At that time plastic was promising to be a big thing. Everywhere it was replacing the old wood and sheet metal things, and then I thought to myself: That could be something for me!"

One day, Otto Graf cleared out the barn behind his home. On 1 October 1962, the first storehouse of Otto Graf GmbH arose on 150 square metres where earlier pigs had been fed with leftovers from the kitchen. "Then I was

a dealer," he says today. "Winemaking articles. As a result, I was away a lot visiting customers." And one day he had a conversation with a vintner. "It always annoyed him to see so many ripe grapes dropping to the ground and being wasted during harvesting. And that gave me an idea." How about using a tray? With a bay for the vine? "I had 5000 units made," said Otto Graf. By the end of the first season he had sold 3000. His selling price for a tray was 10 marks, its production cost 6 – a good profit.

And this was how the former ironmongery clerk Otto Graf first became Count Tray ("Graf" also means "count" or "earl" in English), then Count Keg, when his plastic wine barrels became the next top seller for the new company. The company gradually grew. "I'm always exploring the way ahead. Have always been developing new ideas, predicting new needs, investing a lot. It was all running really smoothly, and I can still remember clearly how I was always making appointments with Mr Hauser, Director of the cooperative Volksbank. 'What have you got planned now?' he asked, and I was hoping he'd give me 8000 marks, a huge sum to me in those days."

**A grand master plan** or some such he never had, said Otto Graf in retrospect. And no goals either in that sense. "I mean, what 25-year-old does? I wanted to have some money in my pocket, drive a car, and not have to beg when I wanted something," explained the founder. And so he thought about things and threw himself into his work, sometimes 100 hours

and more each week. They were exhausting times then, he said.

Yet the efforts are paying off. And when Otto Graf one day purchased a piece of land close by the motorway and built two halls there, that was beyond everybody's understanding. "They were all wondering, What does Graf want with such big halls? And so far away from here? For me, though, it was a first row seat in the sun. Practical logistically, and you could see us from the motorway, certainly no harm in that."

At that time, the trays were being delivered from Trossingen, and the barrels Otto Graf and his wife Elfriede, then working full time at the company, had made in Bötzingen. And because nobody wastes anything in Baden-Württemberg, the young entrepreneur soon started accepting second-choice barrels as well. "Not for winemaking, for rainwater," he explained. "But what that was going to lead to, nobody could tell."

**In 1970 Otto Graf and his** friend Charlot Farny set up a sales branch for France. Charlot was a vintner, dealer, and great all-round guy. "A really good friend we have a lot to thank for! It wasn't like it is today, with all the borders open. Then you couldn't pass the borders with a few barrels as samples. So I sold to Charlot, and he built up sales in France." That this would later evolve into the major production site in Dachstein, Alsace, was unforeseen by all in the early 1970s. This needed yet another encounter – with Dr Edmund Dolfen in the mid 70s. The man was commissioned by the Israeli

*»They were all wondering, What does Graf want with such big halls? And by the motorway as well?«*



### ^ The beginning in Alsace

Plastic tanks on the GRAF production premises in Dachstein, early 1970s

company Roto-Plast to seek exclusive partners throughout Europe for its innovative rotary machines. "The idea was to have a partner in each country. I thought that was an interesting idea and flew with Dolfen to Jerusalem. The machines looked really impressive, the price was okay, and I could convince the Israelis to grant me the exclusive rights not only for Germany, but for France as well." On the arrival of the first rotary machines from Israel, the deal- >>

»Being successful means keep moving, keep finding ideas. Even at the weekends there's something brewing up there that then falls in a brainwave«

Otto F Graf

>> er became a manufacturer. "And all at once I had to find products and ideas that would claim the full capacity of these machines," said Graf. "And it was good that we had been selling water butts since 1974 with the catchy phrase 'Rainwater costs nothing!' Everybody understood that."

**Graf is expanding. Year by year.** By 1990 GRAF in Alsace was running the largest rotary machines in the world. Also the Teningen location is expanding – and there are many more ongoing projects launched by the energetic entrepreneur. Following its decision to set up its own plastics production for a new business line, GRAF is now facing a market a lot larger than when it catering exclusively to winemaking and agriculture in the cooperative banking (Raiffeisen) segments.

All at once there were GRAF products for everyone, and Otto Graf was busily building a network of retailers. "Our products had to impress both customers and dealers, we always attached great importance to that," he recalled. "And that meant we had to keep moving, keep finding ideas. Including the weekends. There was always something brewing up there which then fell in a brainwave." Yet not everything got off the ground. The roofbox, for instance. That was a flop. "Sometimes the thing would suddenly pop open on the road," confessed the Senior Partner. "Then we just gave up on it. If we'd thought about it more at the time, who knows? We'd probably be shipping roofboxes out of Baden-Württemberg as well." Better sellers are the plas-

✓ **Otto Graf and his muse**

"Bacchus as a muse is now way out of place here in the company," he confessed, "but he does represent my beginnings."



tic composters from the 1980s, of which there are now over 4,000,000 worldwide.

**And yet all of this fails to compare with what started out as a few yogurt pots** in a Swiss chalet: modern rainwater solutions of plastic. That these now are also being made from recycled yogurt pots is all the more pleasing to the senior partner – and makes him proud: "I'm delighted that my son entered the company in 1996 and has achieved so much with his great team," he concluded, and turned his eyes yet again to the future. To his two grandchildren. Now representing the third generation, the two boys are close to taking up their positions in the starting blocks. Apparently the story of this family enterprise has still a long way to go ...

PHOTOS: BENEDIKT SPETHER, GALINA ENS · COPY: ANNIKA SCHUBERT

# Short routes, huge effects

Perfectly harmonised logistics is essential if the goods are to arrive as quickly and sustainably as possible. How these processes intermesh at the four locations we'll see behind the scenes



<< At the Competence Centre for Raw Materials in Herbolzheim, silo trucks load and unload the recyclates that are then transported to the other locations in the region.

The GRAF depot in Teningen looks like a section through an anthill. Countless forklifts zoom over the grounds, and you can't help wondering why there are no collisions. For our colleagues working there, this is an everyday routine that can be learned. As professionals do. Deputy Dispatch Manager Tobias Henfler is there in the midst of it all and exchanges a few words with Heinrich Kraft, one his forklift operators.

Compared with what it's carrying, a voluminous tank on the tips of its slender tines, Kraft's vehicle almost dwarfs into insignificance. "How long does it take to load a truck? That depends on the order. In most cases, though, less than 20 minutes," replied Kraft, who has been sitting behind the wheel at GRAF for over 20 years. And before you know it, he's off, unloading his pallet and disappearing among the stacked rows of products.

**So that GRAF forklift operators know** what products to load on what company truck, they need to be directed by employees like Tobias Henfler, who is now making his way back to his office. Henfler coordinates the daily tours of the four company trucks that are to maintain among other things the availability of goods at the four locations in the region. He organises the routes for the continual, optimised supply of the goods and materials needed at each of the locations. He is also responsible for a silo vehicle owned by GRAF. This vehicle transports the plastic recycles, produced at the nearby Competence Centre for Raw Materials, to the production sites where they are converted in their turn into sustainable rainwater manage-



ment solutions. And so that production continues uninterrupted, it needs an unflagging supply.

"There's a lot to be coordinated between the internal locations. For instance, we order goods in Teningen that are produced in Dachstein. Vice versa, Dachstein orders goods that we produce exclusively in Teningen," explained Henfler. A blessing that the routes in the region are short – and that's exactly the way it should be. "It's important to us that our locations are close together," said GRAF Managing Director Otto P Graf, explaining that this not only promotes efficiency, but also affords a key contribution to the local image of a sustainable company. "It would otherwise be extremely difficult to justify introducing sustainable products on the market after emitting huge amounts of CO<sub>2</sub>," he concluded.

A tour to all four locations doesn't even clock up 84 kilometres. And the new one, Neuried, lies right on the route to Dachstein in Alsace. No surprise then that GRAF decided to build the new plant here together with a logistics centre. And equally no surprise that the planners had their pocket calculators ready while they were still considering the idea. "The route to Neuried will help us save over 2000 truck journeys a year," summed up Heiko Rapp. "This saves costs, not to mention a huge amount of CO<sub>2</sub> emissions," the plant manager continued.

**Now back to Teningen.** That there is traffic between the locations can basically be put down to the various production methods applied at each, and accordingly to the products and their availabilities on site as well. One typical example named here is the Vino water butt, which is produced in Teningen only.

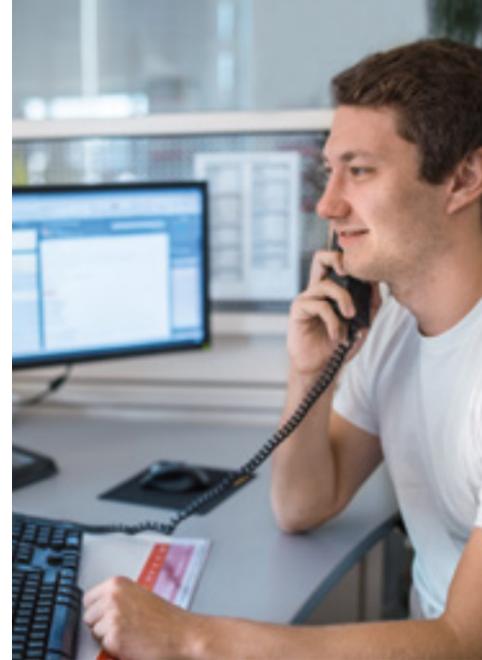
"There are always a few trucks of them going to Dachstein. They need these barrels to complete their orders from France," explained Tobias Henfler when asked about the principle involved. He is in constant dialogue with his colleagues at the other locations. After all, if there's one thing logistics needs to keep a watchful eye on, that's the overall picture.

**And, of course, efficiency is important too.** Assuming the system receives a customer order for 8 tanks, these must be shipped as quickly as possible. Order priority is visualised by a control tool that sorts the orders according to the requested shipping dates. "We have a golden rule, and that says: Efficiency and short routes are maintained when products are shipped from that location that can cover most of it," said Logistics Manager Ralph Neumann. Incidentally, end customers directly >>

^ The GRAF open-air depot at the Teningen base. Generously planned stocks safeguard a delivery performance of 99% – also in the peak season



**Busy little forklifts**  
With a load like that, it's better in reverse...



^ **Coordinating the company trucks** is one of the core assignments of Deputy Dispatch Manager Tobias Henfler in Teningen



<< **At the packing site (left)**, split second decisions are made as to how products are best packaged for transport. On the right: Logistics Manager Ralph Neumann

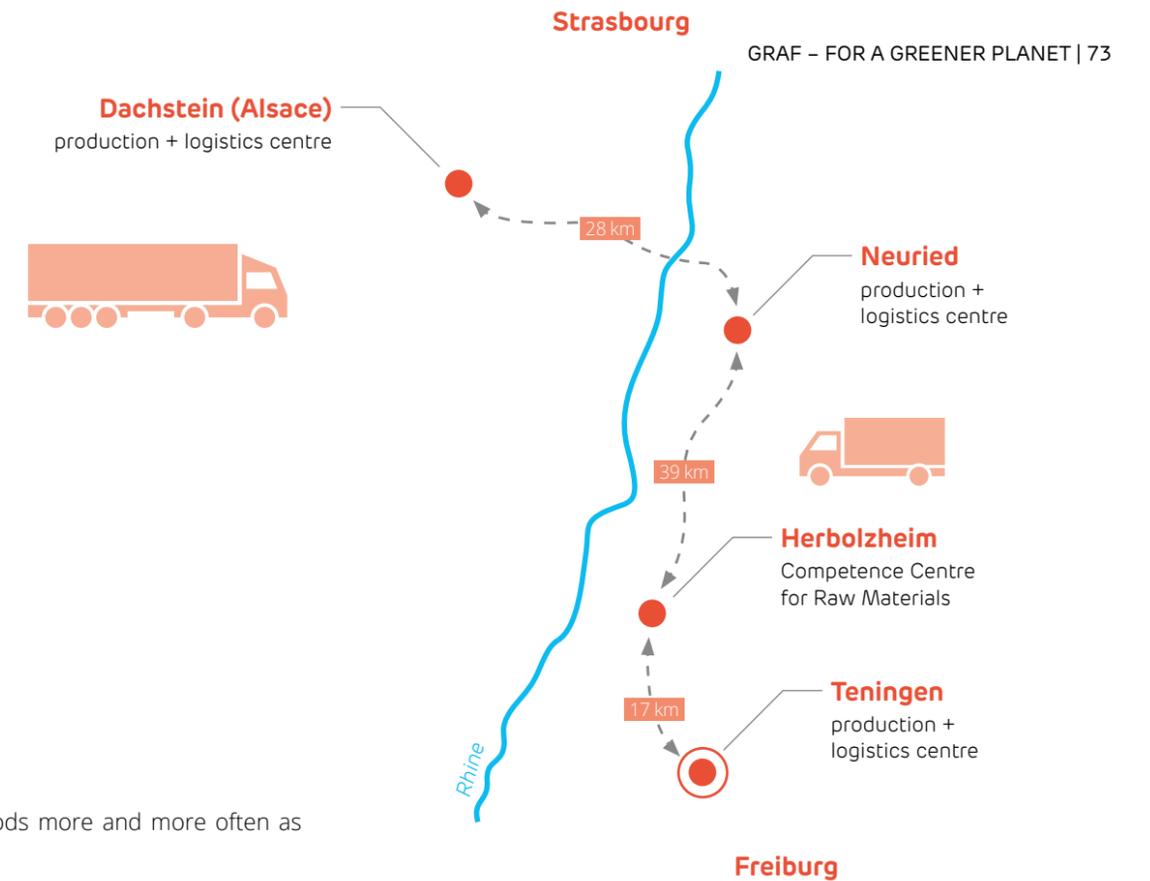
v **A wrapping machine** prepares the goods well for shipment



>> receive their goods more and more often as drop shipments.

**And so everything runs smoothly** this of course needs the collaboration of the most diverse actors. Including, for instance, staff at the purchasing division. "They know what we need because they plan our work in detail," explained Neumann. No less important are the order pickers. On receiving an order, they retrieve the packing list from the shipping office. The goods needed for the order are then collected on pallet jacks from the storage bays and depots and brought to designated packing sites. At the packing site, the goods are then scanned, divided according to their packaging material, and transported to the loading ramps for the artics. "The loader scans every product before transferring it to the truck. After loading the trailer, he presses a button on the scanner which then prints out the cargo list," explained Neumann. What's special here, he continued, is that the cargo list is also sent immediately to the carrier responsible for this trailer. So they know even before the truck arrives at the carrier node what has been loaded and its destination.

Better than planning well is anticipating even better. GRAF applies a method that analyses regularly what articles are needed most in a year. The stores are then restructured as a result. The first row, for instance, consists of the



Top 100 articles. Also each packing site has its own minor stores with the 30 most important articles. "Our slogan of short routes doesn't apply to the road alone, but everywhere," emphasised the logistics manager.

**Its transportation of goods** is the fruit of collaboration between GRAF and several carriers. Dachstein caters to all customers in France. Teningen is responsible for pan-European and worldwide transports. On a good day, Teningen can load about 50 artics in double shifts. The logistics manager explained that their resource-saving processes also prioritise the 100% utilisation of truck capacity. Alsace has likewise introduced double shifts.

How GRAF logistics can be summed up in a nutshell? "We ship eco friendly products in the most environmentally friendly manner possible. And this claim hinges on efficiency and short routes," replied Neumann. And he foresees a lot of twiddling and tweaking in the future as well ...



PHOTOS: BENEDIKT SPETHER · COPY: ANNIKA SCHUBERT

## On the road again

We need colleagues like him: Konstantin Keider is a truck operator at GRAF and so ranks among our everyday heroes. His journeys through the region safeguard the unflinching supply to the locations

*»I can always drive around congestion. I know the roads in this region like the back of my hand«*

It's just touching seven o'clock on a Monday morning. Wide awake, Konstantin Keider, GRAF truck operator, has reported at the logistics office in Teningen. A last sip of coffee from his cup, and then he'll be up in his cab. He got up out of bed hours ago. The first 12 km of the day he's already put behind him ... on his bike. As every morning. "That's how I stay fit," explained the professional driver. "I do a lot of sitting, so I need to compensate."

At the start of the week Keider already knows that his shiny red GRAF truck will be clocking up 1600 kilometres. Or about 320 kilometres a day. That's the distance he will be covering with his vehicle between the four locations in the region: from Teningen to Neuried, where the new logistics centre has just recently been inaugurated, then on to the GRAF plant in Dachstein, Alsace. From there he'll then turn southwards to the company's Competence Centre for Raw Materials in Herbolzheim before returning to Teningen. That's Tour 1. He generally travels this route twice a day.

**Konstantin Keider ranks among the many everyday heroes at GRAF**, all key constituents of the whole. Colleagues like him keep everything in working order. The continuous supply of goods ultimately devolves upon him and his fellow operators, all travelling from location to location every day with the company's four trucks, state of the art, energy efficient vehicles that have recently undergone general overhaul. At each location, consignments to the end customers are then collated and shipped by external carriers. Also a silo truck can be seen every day on the region's

roads. This carries exclusively the recyclates from the Competence Centre for Raw Materials in Herbolzheim.

"And if something should run out, we'll pick it up and bring it with us on the next trip," said Keider. He reaches for the delivery slip in his letter tray, wedges a case with a combination lock under his arm (the inhouse post for Neuried), and takes his leave of his colleagues.

**Outside on the Teningen courtyard, a loaded truck is already waiting for him.** This vehicle can carry up to 36 tonnes. The operator quickly checks the air pressure in the tyres and the trailer's tarps before climbing into the cab. The vehicle is 20 m long. Is it hard to manoeuvre this rig? Keider shakes his head with a smile. Apparently, it responds like a kitten to the experienced driver.

Keider started working for GRAF in the spring of 2004. At that time there were only two locations: Teningen and Dachstein. And he had to load and unload the truck himself, he recalled. Today all that's done by the logistics guys. He is responsible above all for transporting the products from location to location, and securing them for this purpose. In most cases, they are pallets carrying accessories, small and >>

**<< Konstantin Keider** has been working as a GRAF truck operator for over 18 years

# Reports



« **Truck operator** Konstantin Keider has soon detached the cinch belts and transport braces, and the forklift drivers can start unloading the bed.



^ **Carrying a new cargo, the truck resumes its journey.** From Neuried, it's now headed for the GRAF location in Dachstein over the French border

>> large tanks, but also the occasional tools needed urgently at another location – all stowed on the truck's bed to millimetre precision by forklifts. "The biggest products are always positioned directly behind the cab, after that come the smaller ones, with the smallest taking up the rear," he explained. It's safest that way. On the trip to Neuried 45 km away, Keider, who came to Germany from Kazakhstan with his parents and sister in the early 1990s, started talking in a flawless Baden accent about how he always dreamed as a kid of driving heavy vehicles as a profession. That he still loves this job today cannot help sounding like a logical consequence. "Another good good thing about GRAF is that they organise their tours to perfection. My colleagues at each location always know what I'm carrying. And there's a good working atmosphere."

**And if there should be congestion on the motorway** – "the only annoying thing about the job" – the operators then contact each other to try and find an alternative route.

"After all, I know the roads in this region like the back of my hand," he concluded. Yet even when there's sluggish traffic, Keider's cab is a nice place to be. Not only air conditioning, also ACC and an auto braking and steering control are on board. Initially, the 55-year-old found it hard to get used to a truck without wing mirrors. Instead, cockpit cameras are fitted that safeguard the unobstructed view to the rear. "I had to get my head around that," he laughed.

**Having arrived in Neuried**, the truck hisses briefly, the steering wheel swings up, and the seat, which has just been rocking up and down, descends a few centimetres. "That makes getting out easier," explained Konstantin Keider. He reaches for the inhouse post and documents and passes them to his colleague at the office. They've known each other for years and exchange a few words. Papers are checked, then unloading begins. Keider loosens the cinches, pushes the tarps to one side, removes the transport bracing from the truck, and gives instructions to the forklift operator.

And as quickly as his truck is unloaded, just as quickly is he back on the road with a new cargo for the next stop in Dachstein. Belts are cinched, the tarps flap, a new delivery slip for the French location. "It's the same at each location," explained Keider. He climbs into his cab and leaves the yard in a good mood and with a parting honk – see you soon, France!



## Plus X Award for Platin XL and XXL

### Supersized GRAF flat tanks receive innovation award

And yet again, GRAF products, this time in the form of the Platin XL and XXL flat tanks, have been honoured with the world's most acclaimed innovation prize, the Plus X Award. "We're overjoyed at this distinction, underscoring as it does our claim to quality and innovation," announced Managing Director Otto P Graf. This year, the panel awarded its coveted quality seal to the GRAF flat tank Platin XL and XXL in the categories High Quality, Ease of Use, Functionality, and Ecology. With a maximum capacity of 65,000 litres, the GRAF flat tank Platin presents a convincing array of benefits that only plastic tanks can offer: its low weight means less work and lower costs for its transport and installation.



## The most sustainable product of the year

### GRAF EcoBloc Inspect honoured for its ecological aspects

Infiltration ditches are underground systems that control the seepage rate of rainwater and promote the replenishment of groundwater.

With its modules, EcoBloc achieves this in a particularly efficient and therefore sustainable manner, and is made of 100% recycled plastic to boot. The panel set up by the web portals Baustoffmarkt and baustoffPARTNER therefore voted it Product of the Year.



## Recycling – 3 million mark reached for the first time

### A new GRAF record for products of self recycled plastic

Last year, Otto Graf GmbH for the first time made 3 million products of self recycled plastic. This success was made possible by research into new ways of incorporating self recycled plastics in GRAF products.

## UBA visit to Herbolzheim

### Great praise for the sustainability concept behind the Competence Centre for Raw Materials.

"The example set by GRAF shows how important it is to conceive in parallel the design of recycled plastic products and the recycling process for generating these recyclates," concluded professional adviser Dr Franziska Krüger on a joint visit with KfW bank representatives.

## Energy Globe National Award Germany

### The Energy Globe Foundation's Award for Sustainability goes to GRAF.

The award honoured the Competence Centre for Raw Materials in Herbolzheim where plastics recycling helps to save 100,000 tonnes of CO<sub>2</sub> emissions a year, equivalent to the output of 60,000 passenger cars. Its sorting process for recyclable plastics is unique the world over.



PHOTO: OTTO GRAF GMBH

**Pretty big box**

The new plant in Neuried close to the French border produces large tanks. And to the rear is the new logistics centre. Also an additional PV installation will soon be mounted on the roofs.

COPY: STEPHAN FUHRER

# Think Big!

At its new plant in Neuried, GRAF is thinking big. Here, so called giga tanks will be produced, with capacities as large as 122,000 litres. And the building also shows other signs of this think big philosophy – for good reasons...

**On the day the new GRAF plant in Neuried was officially opened,** it was hot. Very hot. On this July day, the thermometer soared to an almost unbearable 40 degrees. And even though it's still quite pleasant inside the halls, without air conditioning thanks to good planning, the host Otto P Graf addresses the issue directly in his brief formal speech. "Climate change cannot be denied, and days like these will become more the norm than the exception in future summers", he said. And more heat, he

continued, will also mean more problems with our water. "And precisely for this reason has demand exploded recently for larger tanks," he concluded in explanation of his intention behind the new building. "For in months like these, when not only we ourselves, but people throughout Europe are enduring protracted heatwaves that cause droughts, lower groundwater levels, and even lead to water rationing in some places, our products may afford a key contribution towards the solution." >>

*»When the dry months start increasing, our products will become part of the solution«*

>> What “big” means here precisely the guests from politics and the press are to learn on a subsequent tour. The largest tanks can hold up to 122,000 litres, and are up to 28.6 metres long. These titans, though, are not made in the one piece, but in separate parts, which are then joined together on high precision machinery. Not a few of these machines owe their existence to the knowhow of GRAF engineers as well. For instance, the machine called lovingly the Shuttle. Or the Rock ‘n’ Roller, which got its name from the way it rocks and shakes all the time (and conveniently optimises the distribution of plastic throughout the mould). The GRAF concept behind its XXL tanks of plastic segments had already earned it the 2010 Baden-Württemberg Innovation Award and the 2013 Innovation Award sponsored by the Federal Ministry for Economic Affairs and Climate Action (BMWK). These technologies and methods underwent an incremental evolution and have now reached completion at the Neuried plant.



**Neuried is the family enterprise's fourth location** in the region, lying at an optimal point for traffic between the head office in Teningen, the Competence Centre for Raw Materials in Herbolzheim, and the Dachstein plant in Alsace. This is no coincidence. GRAF can now save a great many trips by truck (more in our article about short routes on pp 68 ff). Also, the new plant not only produces large tanks, but also has as its direct neighbour the new logistics centre. “We all did our utmost to stay on this line between our locations,” said Otto P Graf. That too helps, he continued, to afford an important contribution towards reducing CO<sub>2</sub> emissions. About 80 employees will be working here in the future. The plant, in which GRAF readily invested about 30m euros, is located on the industrial estate BA-SIC Kehl-Neuried and covers 10 hectares.

PHOTOS: Benedikt Spethner: GRAF



**<< Now THAT is BIG!** Senior Partner Otto F Graf was there at the inauguration in Neuried. Left the rotary machine, top a look into one of the huge halls

**Yet not only GRAF products focus on environmental protection and sustainability,** also the planners incorporated this as a central issue in the new location. The buildings have been fitted with extensive insulation, the facades have been greened up, and there is heat recovery throughout the plant. The bathrooms and cleaning systems use rainwater (of course), and excess precipitation infiltrates completely on the premises. And the novel machine technology, too, is sustainable and saves a proud 90% of the energy consumed by the previous technologies and standards. At the same time, a local photovoltaic (PV) installation has been generating sustainable energy since October, and a project for utilising elec-

tricity and gas from the neighbouring biogas system has already left the starting blocks. And from 2023, the gas now used to produce the large tanks will be replaced in part by home-grown electricity. And people, too, benefit from these ultra high environmental standards, as the guests soon learn. Soundproofing mats reduce the noise levels in the production halls and promote a good working atmosphere. And the production hall itself provides for pleasant temperatures, even on hot days like this, without the need of a cooling apparatus – thanks to an ingenious control system that lets the building cool down overnight. On a day like this, a benefit that is particularly appreciated ...

COPY: STEPHAN FUHRER

# A high five for rainy weather!

All gardeners bless the rain, but who really needs it on holiday? Nevertheless, it followed our author to the middle of the Atlantic...

**The Azores High – we’ve all heard of this from the weather forecasts.** It sounds like a holiday, like lots of sun and sea! So, off to the airport, to the mid-Atlantic isles, and totally wicked – what a sight! There it towers, the Azores titan Mount Pico, apparently straight out of the sea and into the heavens. How it invites you to climb to its top! At 2351 metres, this volcano in the archipelago is, after all, the highest mountain in Portugal. You won’t need crampons for the ascent, just a little willpower and some luck with the weather. Not a huge problem for untalented climbers, like me. It’ll be a breeze, and I’m really looking forward to it!



At the little airport, my eyes again turn to the mountain. The snow-bound peak glows in the sun like frosting on a cake. A first snapshot with Pico in the background, then a cloud settles around the massif, enveloping it in a grey mist. Then it starts to rain. In torrents... But no matter, the climb is scheduled for the next day. But the next day it’s raining again. Did I say “raining”? It’s pouring down! And if the stone huts on the steep faces had here

a proper Carat XXL tank, it would have been filled to the last drop after only a few minutes. Whatever: where is this Azores High at all? Google tells us that it never arrives on the islands. Instead, it forms somewhere in the archipelago before moving off towards Europe. Leaving behind a low-pressure area. Jeez. I’m now sitting with a book in my holiday home, and next to me the stove is roaring away. The evening has brought with it cooling temperatures. Has it stopped raining? No, not yet.

Next morning there’s rain, it’s foggy in the afternoon, and the evening crowns it all with rain. Everywhere I see countless rainbows, but not Pico, the whole day long. And it’s the same again on the second and third day of our stay on the isle named after its mountain. Damn! We have to move on to the next island. Arriving there, I turn to look back at the all-surmounting volcano. At that moment, the mist withdraws, and the peak reemerges in full splendour. “Shitheap,” I mutter, and so celebrate my climb to the top back in Germany, on the Feldberg. By car. In the best of weather. Thanks to the Azores.



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