



**Gesellschaft für
fluorfreie Technologie**
BRAND- UND UMWELTSCHUTZ



FLUORINE-FREE TECHNOLOGY

Convert to fluorine-free. Operate safely.

Analysis, cleaning and full rebuild from a single source.

Fire and environmental protection

As of August 2026





The transition requires more than a new extinguishing agent

Regulation, missing standards and complex interfaces converge.

01

REGULATION

PFAS requirements are tightening. Operators must reliably manage deadlines, limit values and documentation.

02

IMPLEMENTATION GAP

Many providers cover only individual parts. Analysis, cleaning, rebuild and acceptance require integrated management.

03

SYSTEM COMPLEXITY

Chemistry, plant engineering, fire protection, water-law compliance, disposal and documentation are directly interlinked.



We deliver the complete conversion

From analysis and cleaning through full rebuild to a fully operational system.



GffT combines analysis, execution and full rebuild

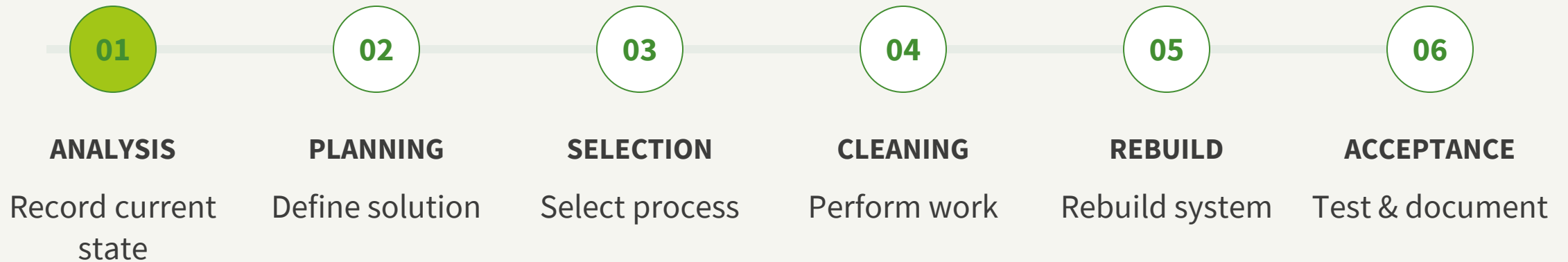


- 1 Assess inventories and risks.
- 2 Select cleaning and rinsing methods for the specific system.
- 3 Drain, clean and dispose of materials in practice.
- 4 Modify the system, rebuild it completely and recommission it.
- 5 Prepare documentation and guide the project safely through acceptance.



One point of contact delivers the entire conversion

From analysis to a fully operational system.



GffT plans, executes and assumes responsibility for the entire project.



Full responsibility through to an operational system

ANALYSIS

Record the current state, inspect the system and plan the technically and economically appropriate route.

EXECUTION

Drain, clean and rinse. Modify or replace components. Rebuild the system completely.

APPROVAL

Refill, function-test and provide the documentation through regulatory acceptance.





Four values. One promise.

GffT manages the entire project – maximum legal certainty with minimum effort for the operator.

01 LEGALLY COMPLIANT

WHG-compliant processes and authority-ready documentation minimize liability risks.

02 TRANSPARENT

Clear communication, realistic schedules and honest costs – with no surprises.

03 INDEPENDENT

Manufacturer-independent recommendations based on technical suitability – not margin.

04 FUTURE-PROOF

Solutions that work today and remain viable under future PFAS requirements.



01

PFAS in fire protection

Why action is needed now





PFC, PFT, PFAS: The terms differ – the risk remains

PFAS

Per- and polyfluoroalkyl substances

Fluorinated firefighting
foams used PFAS for aqueous
film formation and high
burnback resistance.

PFC

Umbrella term for per- and polyfluorinated chemicals

PFT

Umbrella term for per- and polyfluorinated surfactants

PFSA

Perfluorosulfonic acids – a substance group

PFCA

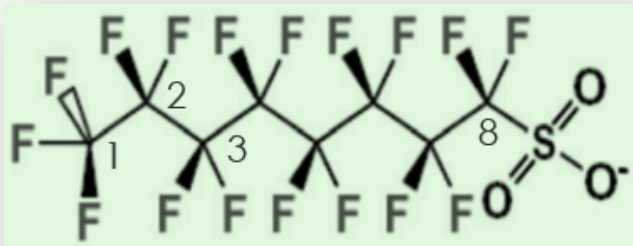
Perfluorocarboxylic acids – a substance group



PFOS and PFOA are two well-known C8 compounds

PFOS

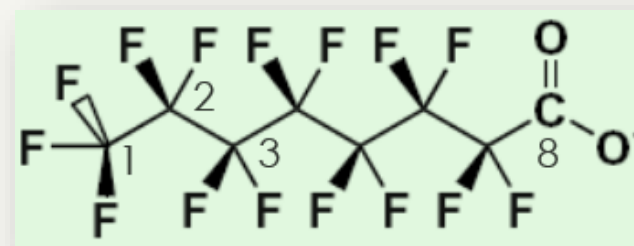
Perfluorooctanesulfonic acid



C8

PFOA

Perfluorooctanoic acid



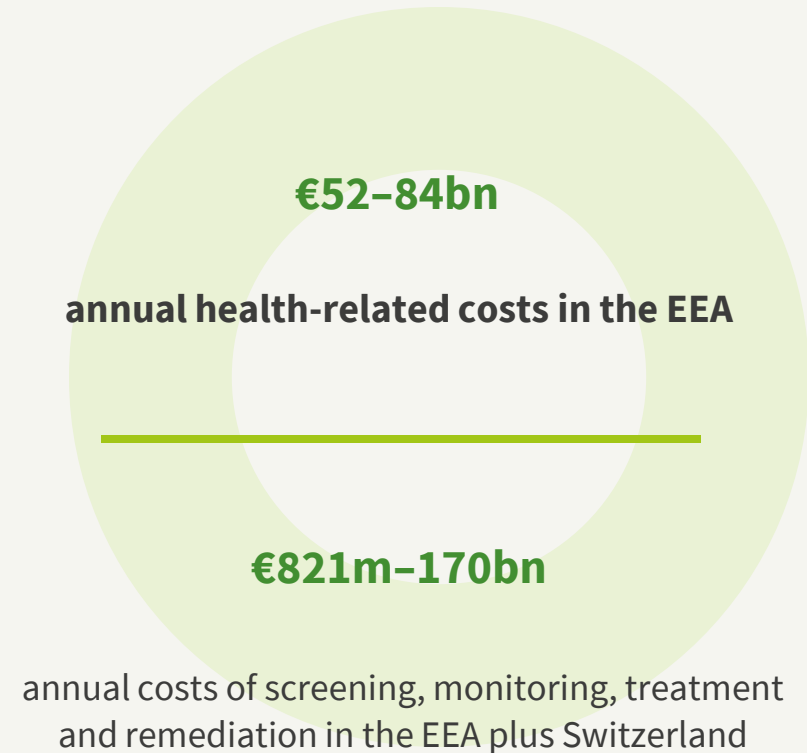
C8 refers to the eight carbon atoms in the fluorinated chain.



PFAS persist – and cause high downstream costs

Many PFAS accumulate in the environment and in human and animal tissue. Some are suspected of causing cancer.

The burden persists for decades: health impacts, monitoring, water treatment and soil remediation generate substantial costs.





Four properties make PFAS particularly critical

- 01 **Persistent in the environment**
- 02 Accumulation in food webs
- 03 Toxic to reproduction
- 04 Critical toxicological profile – e.g. PFOS, PFOA and PFNA



PFAS are already detectable in the human body

25 %

Up to one quarter of the adolescents tested had exposure levels at which health effects could no longer be ruled out with certainty.

- PFAS were detected in the blood of all adolescents tested across Europe.
- Exposure mainly involved already-banned, highly persistent compounds.
- The findings support broad regulation; substitutes may exhibit similar properties.
- Further uses should be limited to applications without suitable alternatives.

Sources: German Environment Agency; Der Spiegel – European study on pollutant exposure

Toxikologische Untersuchungen

Schadstoffreservoir Kind

Eine große europäische Untersuchung liefert Ergebnisse, die Eltern Sorgen machen dürften. Doch Experten warnen anlässlich der Datenlage vor zu viel Alarmismus.

Von **Guido Kleinhubbert**

07.05.2022, 12.43 Uhr



Foto: Gemma Ferrando / Jeremie Roman / Getty Images



Film recommendation: Dark Waters

An accessible introduction to the topic of PFAS.

The film is a useful conversation starter before delving into the technical and regulatory consequences.

PFAS





02

The consequences

Operators must act systematically now.





Four questions determine a safe transition

Reliable answers to these four questions allow deadlines, technology and liability to be managed together.

01

**What is the
current status?**

02

**Which limit values
apply?**

03

**When must we
convert?**

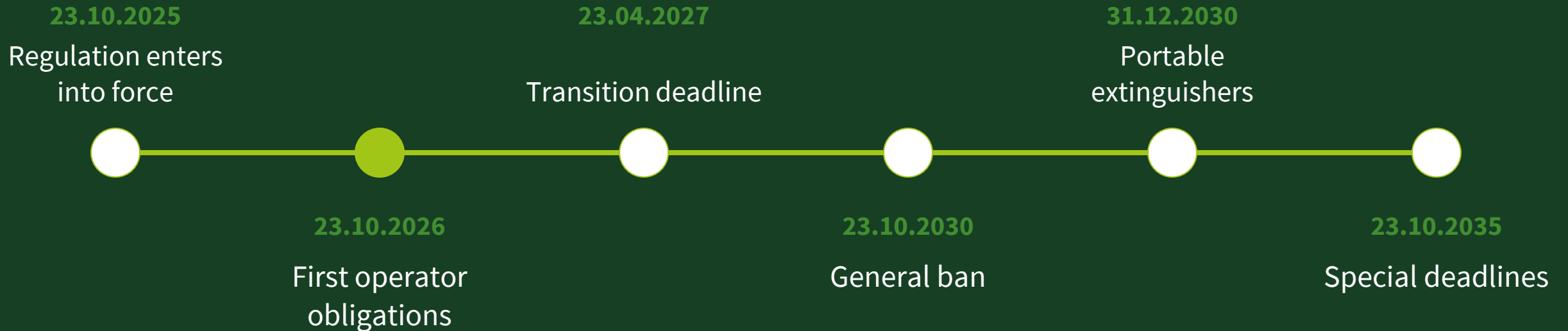
04

**Are existing systems
covered by
grandfathering?**



First operator obligations take effect in 2026

The PFAS-wide restriction establishes binding milestones.





What the new PFAS restriction means for operators

- The REACH restriction covers the PFAS class in firefighting foams at a threshold of 1 mg/L for the sum of all PFAS.
- From 23 October 2030, placing on the market and use are generally prohibited; transitional periods and exemptions remain narrowly limited.
- Stricter restrictions for PFOS, PFOA and PFHxS continue to apply.
- A specific contamination limit applies to foams from cleaned equipment; the Commission will review it by 2030.



Minimum requirements for the management plan

- 1 Use only for fires involving flammable liquids.
- 2 Minimize direct and indirect exposure through technical and practical measures.
- 3 Collect inventories, PFAS waste and wastewater separately and treat them in accordance with applicable requirements.
- 4 Maintain a site-specific management plan covering use, cleaning, leaks and substitution.
- 5 Review the management plan annually, keep it available for 15 years and comply with labelling requirements.



Operator checklist 2026

- Create a reliable inventory of stocks, system types and analytical status.
- Assess portable extinguishers, fixed systems and sector-specific exemptions separately.
- Implement the management plan and labelling on time wherever required by the regulation.
- Define containment, collection and treatment for foam, rinsing water and contaminated components.
- Plan the conversion early, verify technical feasibility and document it end to end.



Legacy stocks remain an operational risk

- Historical GffT estimate: more than 2,000 tonnes of highly fluorinated, C8-contaminated AFFF would have had to be replaced in Germany by the end of 2022.

In 2026, the task is broader: remaining stocks and residues require inventory, analysis, containment, cleaning, rebuild and documentation.

Liability risks for operators

- Operators bear substantial liability risk.
- A robust, documented and legally compliant overall solution is essential.

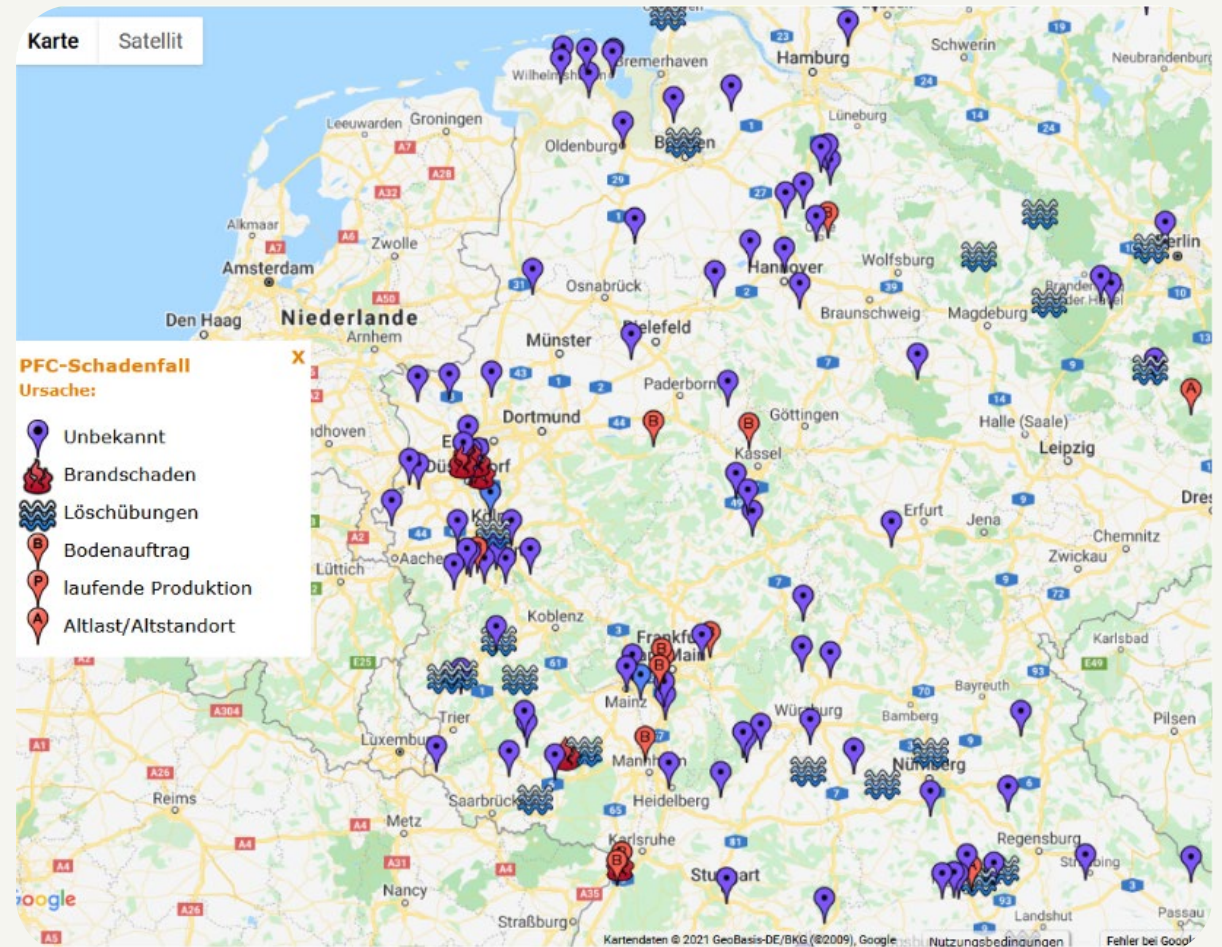
BGH: Baden-Baden haftet für Einsatz von Grundwasser schädigendem Löschschaum

15.06.2018 – Die Stadt Baden-Baden haftet für den Einsatz von Grundwasser schädigendem Löschschaum durch die Baden-Badener Feuerwehr. Das hat der Bundesgerichtshof (BGH) gestern in einem Urteil festgestellt, das den Haftungsmaßstab klärt, der bei einem Feuerwehreinsatz gilt. Der BGH hat damit die Entscheidungen der beiden Vorinstanzen bestätigt.



PFC contamination incidents in Germany

- Nationwide, 177 PFC contamination incidents had been recorded; the cause remained unknown in 117 cases (as of October 2019).
- Particularly affected regions include Altötting, Rastatt, Baden-Baden and Mannheim.
- The cases show how far-reaching contamination of soil, groundwater and drinking water can be.



Incident: incomplete containment of firefighting foam

- Incomplete containment of PFAS-containing firefighting foam can result in significant environmental and liability consequences.
- This case shows that containment, cleaning and documentation must work as an integrated system.
- Image source: TH Köln

Kombination Löschanlage und Löschwasser/ Schaumrückhaltung

- → Problem des viel größeren Volumens!



Incident: accidental discharge of a foam fire suppression system

- Possible consequences of an accidental discharge:
 - criminal investigations into soil contamination
 - violations of water-law obligations
 - high costs for soil removal, remediation and operational downtime





Consequences for operators

- Insufficient containment and PFAS-containing firefighting foams create substantial environmental liability risk.
- Stocks and residues must be identified, releases prevented and contaminated media treated in accordance with applicable requirements.
- Systems and vehicles must be cleaned to the lowest possible PFAS burden; contaminated components may need to be replaced.
- GffT plans and executes the complete conversion through to a fully operational system – including documentation and acceptance.



The solution

The safe path from inventory assessment to a fully operational system.



GffT turnkey solution: through to a fully operational system

GffT full-service implementation

- Analysis, planning and execution from a single source
- Clean tanks, pipework and components
- Modify the technology and rebuild the system completely
- Refill, test and commission
- Authority-ready documentation through acceptance
- Operator relieved, liability risks minimized

Individual measures by the operator

- Separate trades or in-house work
- Methods without a comprehensive inventory analysis
- Interfaces remain uncoordinated
- Residual contamination and technical gaps remain possible
- Documentation is often incomplete
- Liability and schedule risk remain with the operator





The right solution path

The product does not determine the project – the system determines the process.



A range of options

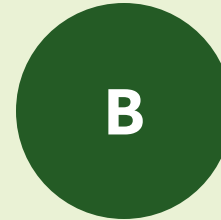
Depending on contamination, system and target value, we combine the appropriate cleaning and treatment methods.



SYSTEM CLEANING

Fresh water · cleaning chemicals ·
component replacement

depending on system



RINSING WATER & WASTEWATER

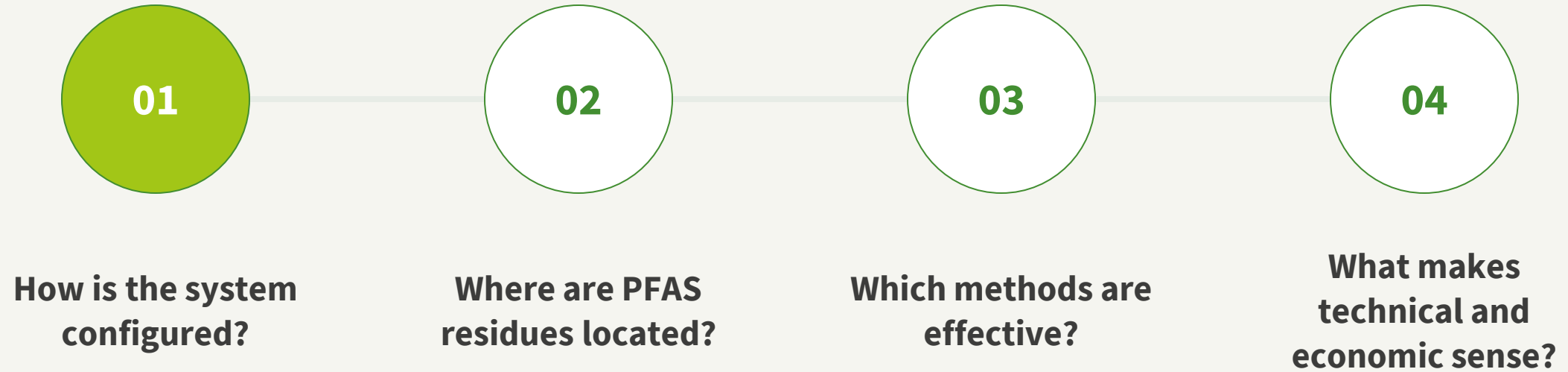
On site · external · thermal ·
combined

depending on volume



How we jointly select the right path

We transparently compare effectiveness, effort, costs, disposal routes and documentation requirements.





We analyze and plan the right solution

- Record the current state, firefighting foam and system components
- Take samples and assess contamination
- Compare feasibility, costs and documentation requirements
- Agree on the approach with the operator





We clean systems and vehicles ourselves

- Safely drain and contain the firefighting foam
- Clean tanks, pipework, pumps, valves and proportioning systems
- Professionally execute rinsing and cleaning methods
- Verify the result through analytical testing



We completely rebuild the system

- Modify or replace components as required
- Install the system and reconnect all interfaces
- Fill with fluorine-free firefighting foam
- Function-test and recommission the system





Rinsing water and wastewater: tailored treatment

- Record volumes and contamination levels separately
- Plan containment, transport and treatment for the specific project
- Compare on-site treatment, external treatment and disposal
- Maintain complete documentation





The result is a fully operational system

- analyzed and planned for the specific system
- professionally drained, cleaned and documented
- technically modified and completely rebuilt
- refilled, tested and commissioned
- documented to satisfy authorities – with one point of contact



Your point of contact: Christian Trahan

CT



Christian Trahan

- Graduate chemical engineer with more than 25 years of experience in plant construction and process engineering
- More than 25 years of experience in fire and environmental protection, particularly in wastewater treatment
- Many years of responsibility for building water-supply units for fire protection
- Dedicated point of contact from analysis through to a fully operational system

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Bundesministerium
für Bildung
und Forschung



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Thank you.

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LEGAL NOTICE

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