Navigating evolving PFAS regulations

Are your products and operations at risk?

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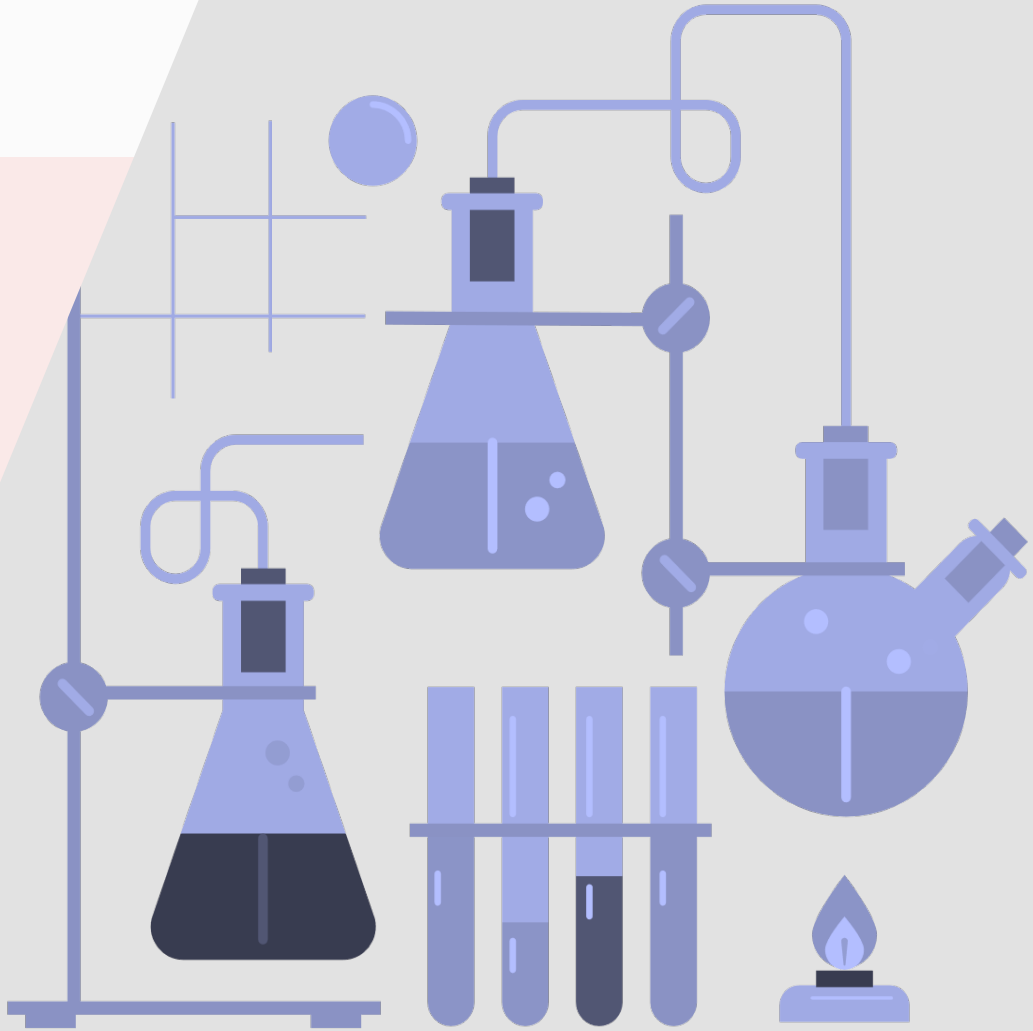
What are PFAS?

... and why are they important?

PFAS Definitions

Per- and polyfluoroalkyl substances

- Defining PFAS has been a complicated, evolving process
- OECD published a 40-page paper discussing the definition of PFAS[1]
- Includes 10,000+ different synthetic compounds
- Different definitions apply to different regulations



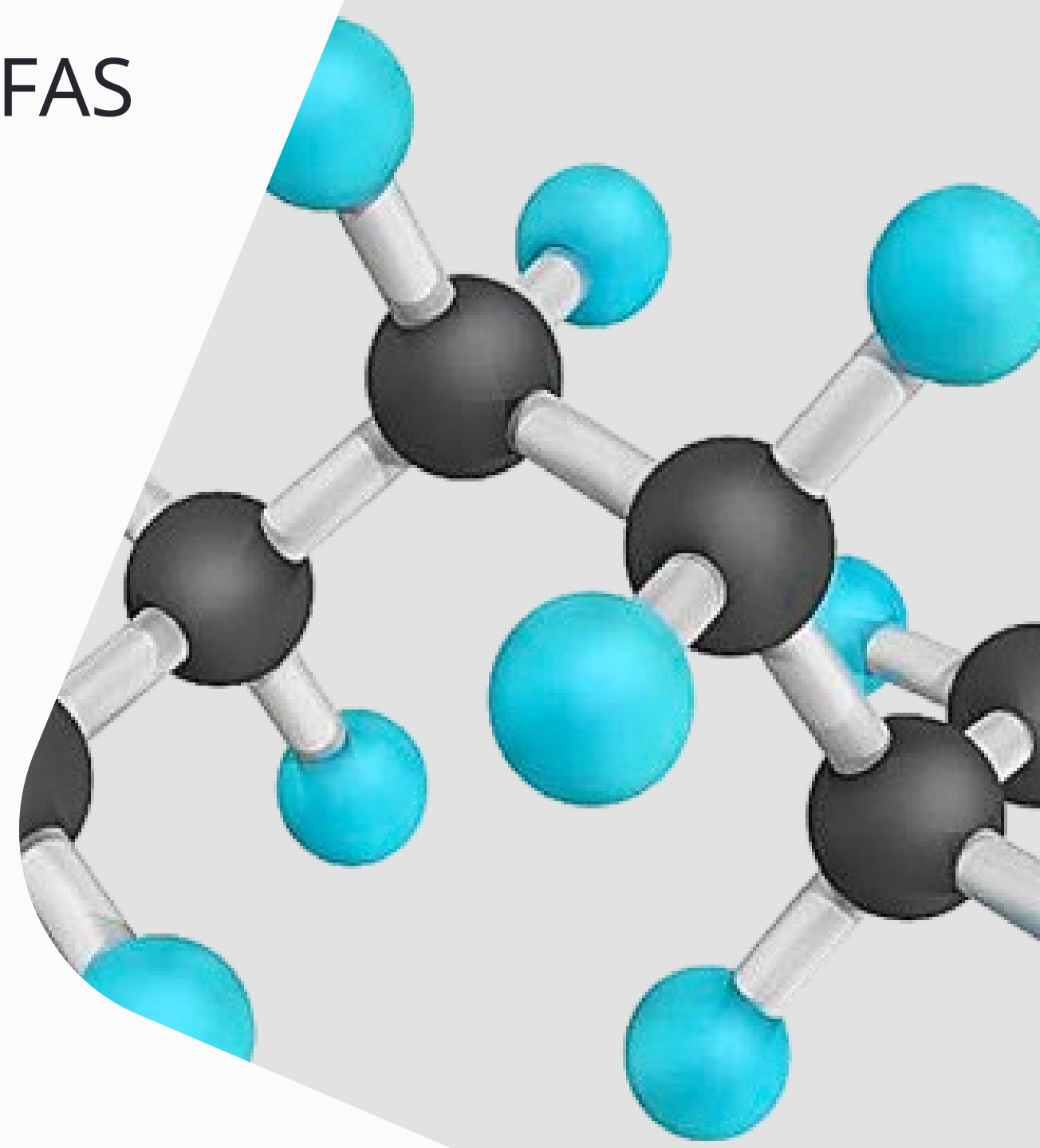
Chemical definition of PFAS

OECD*: Fluorinated substances that contain at least one fully fluorinated methyl or methylene carbon atom (without any H/Cl/Br/I atom attached to it)

- Any chemical with at least a perfluorinated methyl group (–CF3) or a perfluorinated methylene group (–CF2–) is a PFAS."[2]

TSCA: any chemical substance that contains at least one of these three structure units:

- R-(CF2)-CF(R')R", where both the CF2 and CF moieties are saturated carbons
- R-CF2OCF2-R', where R and R' can either be F, O, or saturated carbon
- CF3C(CF3)R'R", where R' and R" can either be F or saturated carbons.[3]



* *OECD notes some exceptions to this definition*

Practical description of PFAS

- A group of synthetic chemicals known for their water and stain resistant properties.
- Used in many everyday products and persist in the environment (i.e., “Forever Chemicals”)
- Have potential for adverse impacts to human health and/or the environment.
- Complex to regulate due to widespread presence, chemistry and lagging replacement product market

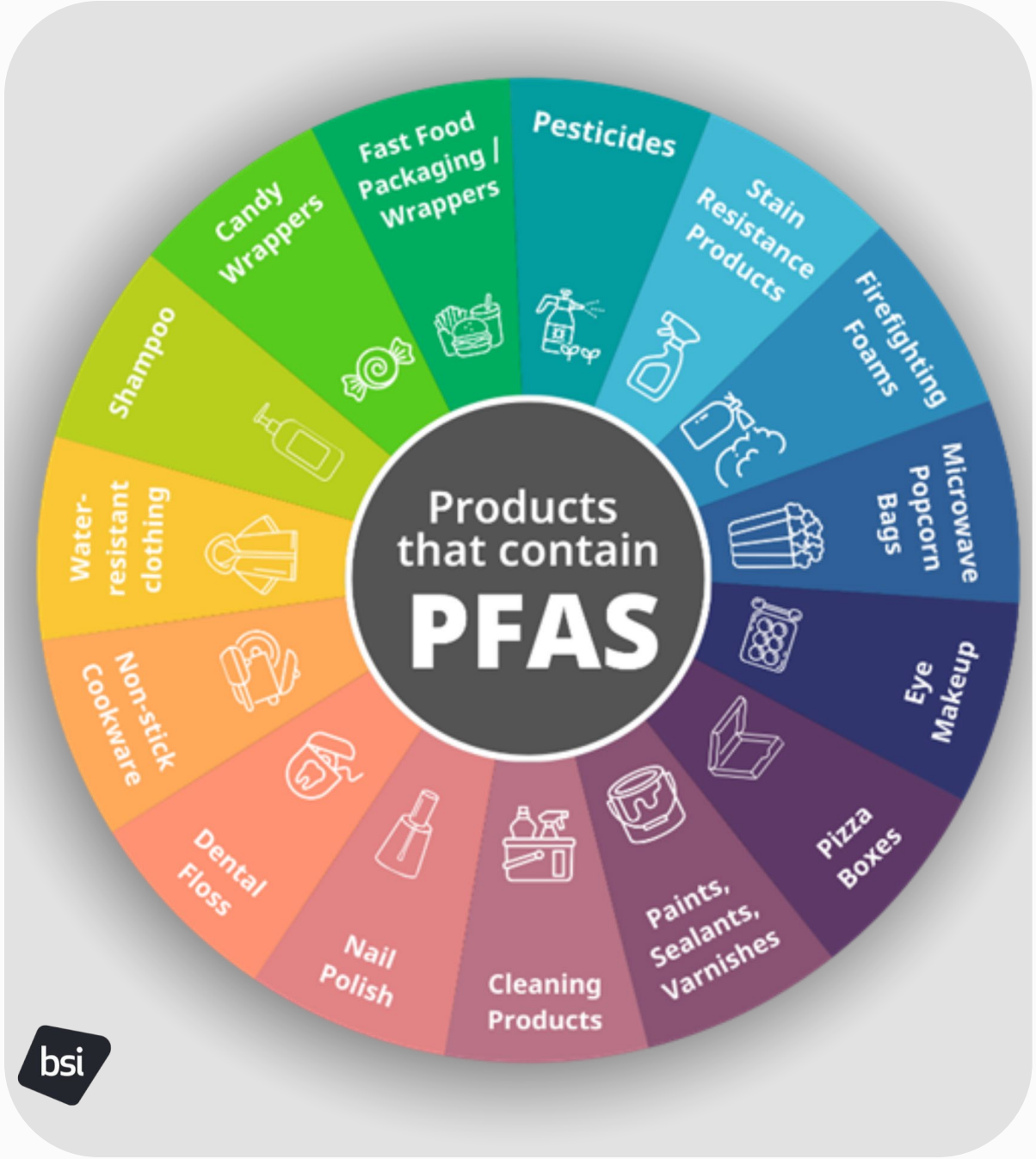
Poll Question 1:

How would you describe the level of attention on PFAS?

1. Not enough attention is on PFAS and its impact on human health & the environment.
2. There is too much hype surrounding PFAS and its impacts are not as significant as often stated.
3. The level of attention is aligned with the level of concerns.
4. We still don't understand PFAS and their impacts enough to answer.

Common PFAS uses

- Water and stain resistant coatings and additives for apparel, carpets, etc.
- Common lubricants, release compounds, etc. in manufacturing processes
- Semiconductor fabrication processes for electronics production
- Lotions, nail polish, shaving cream, makeup for skin conditioning
- Food packaging on coated papers, plastics, wrappers, etc.
- Paints and finishes to improve stain resistance and application flow
- Fire fighting foams (e.g., AFFF)



Common PFAS

There are over 10,000 different PFAS compounds. Most common from a regulatory perspective are:

Perfluoroalkyl Acids (PFAAs)

- PFCAs (Perfluoroalkyl Carboxylic Acids)
    - Perfluorooctanoic acid (PFOA) most common
- PFSAs (Perfluoroalkane Sulfonic Acids) and their salts
    - Perfluorooctane sulfonate (PFOS) most common
- Most common PFAS addressed in emerging regulations
- Do not readily degrade naturally in the environment

Polyfluoroalkyl Substances

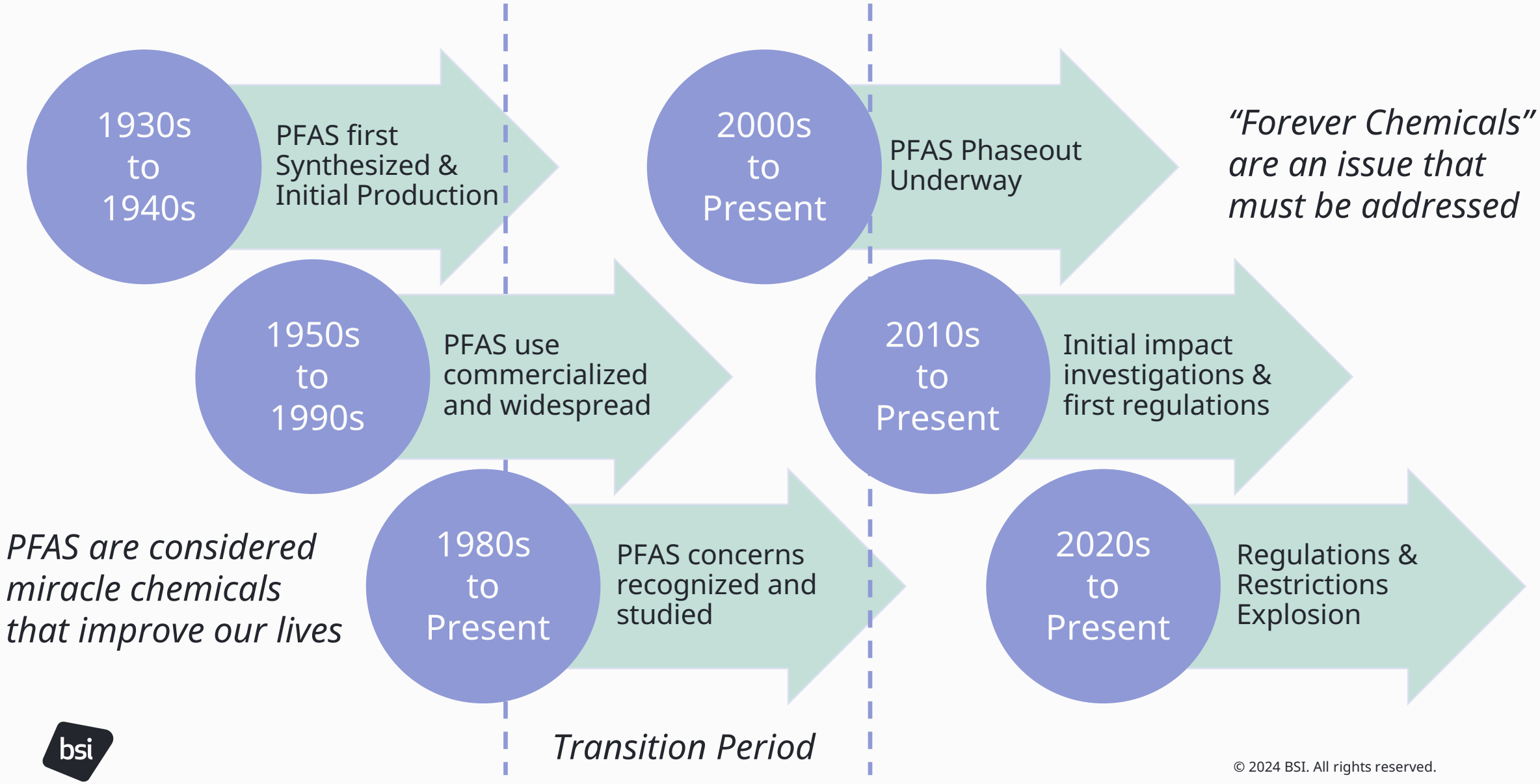
- Generally, are precursors that transform to PFAAs
- Most common are Fluorotelomer Sulfonic Acids FTS) compounds
    - AFFF firefighting foam
    - Treatment plant effluents
    - Landfill leachate
- May be more susceptible to abiotic or biotic transformation

Polymer PFAS

- Some studies have shown these to be of lesser concern with minimal health or environmental risk
- Have not been initial focus of most regulatory programs
- Most common is Polytetrafluoroethylene (PTFE) – Teflon

Excellent source of additional information: ITRC Technical/Regulatory Guidance, Per- and Polyfluoroalkyl Substances (PFAS), Sept. 2023.

Evolution of PFAS in society



PFAS regulatory overview:

Key regulations now and trending for the future

In the beginning…The onset of PFAS regulations

Earliest Regulations

- **2009:** First major EU regulations were the Persistent Organic Pollutants (POPs) regulations limiting PFOS (and salts) in substances and articles[5]
- **2016:** First major US regulations were promulgated by the FDA and banned use of long-chain PFAS in Food Contact Materials (FCMs)[5]
- **2016:** New York State became the first state in the nation to regulate PFOA and PFOS as hazardous substances (adopted formally in March 2007)[6]
- Earliest regulations included exemptions and frequent refinements as more information was gathered and assessed

The PFAS environmental regulations explosion (2020-Present)

Regulatory / Enforceable Programs

Toxic Substances Control Act (TSCA)

Retroactive PFAS reporting for manufactured and imported items annually since 2011

Original 2025 reporting deadlines pushed back to 2026

Comprehensive Environmental Response, Compensation & Liability Act (CERCLA) ,"Superfund"

Inclusion of PFOA and PFOS (including isomers and salts) as hazardous substances

National Defense Auth. Act (NDAA)

Phasing in PFAS covered by TRI under EPCRA since 2020

Seven new PFAS added for 2024 reporting year.

Clean Water Act (CWA)

Established enforceable Maximum Contaminant Levels (MCLs) for six PFAS

Guidance/Planned Rules*

- Proposed RCRA regulations to add nine PFAS to RCRA list of hazardous constituents
- AWQC for certain PFAS
- Interim guidance on PFAS destruction and disposal
- New analytical methods for PFAS
- Restrictions on "restarting" manufacturing of 329 PFAS without risk review
- Unregulated Contaminant Monitoring Rule for 29 PFAS
- Effluent Limitations Guideline Plan 15 addressing PFAS leachate in LFs

** Clean Air Act (CAA) considerations – still in the assessment phase related to PFAS air impacts*

TSCA PFAS reporting

MAJOR CHALLENGE

Who?

- Any entity that **manufactured** (including **imported)** PFAS in any year since 2011
- Exemptions for those who only process, distribute, use or dispose of PFAS

What?

- Retroactive PFAS information for each year starting in 2011
- Quantity manufactured (incl. imported), types, categories, byproducts
- Health effects, exposure, and disposal info
- Electronic reporting

When?

- Final rule published October 11, 2023
- Reporting deadline of **January 11, 2026**, with 6 month additional for small businesses
- This is a long lead process – don't wait!

How?

1. Coordination with supply chain vendors to meet "reasonably ascertainable" requirements
2. Update inventory records including SDS inventory,
3. Automate data reduction/reporting as much as possible with tiered screening approach

TSCA PFAS reporting
How does it impact me?

- **The requirements are not limited to manufacturers!**
  - Those who supply items to manufacturers will need to provide information on quantities, composition, etc.
  - Major burden on support systems including:
    - Procurement/Supply Chain teams (who interact with those supplying imports)
    - Inventory management teams (who have records of PFAS products in the organization)
    - Financial teams (who have sales records documenting purchases)
- Most companies do not have the resources they need to compile and evaluate data to meet “reasonably ascertainable” requirements

TRI PFAS reporting (new rule changes)

Who?

- Within a covered industry sector (NAICS Codes)
- Employs 10 or more FTEs
- Manufactures, processes or otherwise uses a TRI-listed chemical above thresholds

***** chemical list expanding *****

What?

- Multiple PFAS phased in since 2020 require reporting on quantities, classes, releases, etc.
- New “Chemical of Special Concern” eliminated *de minimis* exemptions, range reporting, etc.
- Additional rules would add 15 categories of PFAS

When?

- Final rule with latest changes effective November 30, 2023
- New rule changes start calendar year 2024, reporting due July 1, 2025.

How?

1. Screening to determine applicability and exemptions
2. Update inventory records and align inventory protocols to detect maximums
3. Automate data reduction/reporting as much as possible

USEPA Threshold Screening Tool link: *https://trimewebmod.epa.gov/cdx-tri-threshold-screening-tool/action/home/view/tri*

TRI PFAS Reporting
How does it impact me?

- **Broad NAICS codes, PFAS presence, and elimination of *de minimis* exemption will trigger reporting**
  - USEPA estimates as many as 10,000+ new reporters because of PFAS requirements[7]
  - Significant level of information needed to report
- Release estimates can be complicated and costly to complete

Water quality regulations for PFAS

Who?

- Drinking water suppliers
- Those interacting with groundwater quality
- Primarily targets drinking water suppliers
- Used to develop groundwater quality and cleanup criteria

What?

- Enforceable Maximum Contaminant Levels (MCLs) for six PFAS in drinking water
- Groundwater quality standards and cleanup goals evolving
- Monitoring, notifications, and reductions required

When?

- Announced April 10, 2024
- Initial monitoring completed by 2027, then continuing
- PFAS in drinking water must meet MCLs by 2029

How?

1. Initial monitoring to establish PFAS levels in drinking water supplies
2. Corrective measures evaluated and implemented when MCLs are exceeded

MCLs for PFAS

What are they and how do they impact me?

Compound	Final MCL
PFOA	4.0 parts per trillion
PFOS	4.0 ppt
PFHxS	10 ppt
PFNA	10 ppt
HFPO-DA (commonly known as GenX Chemicals)	10 ppt
Mixtures containing two or more of PFHxS, PFNA, HFPO-DA, and PFBS	1 (unitless) Hazard Index

- **Water suppliers**
  - Major impact on public water suppliers for treatment infrastructure, well siting, etc.
- **Remediation programs, due diligence**
  - MCLs often used as basis for groundwater quality standards and remediation cleanup objectives
- **Operations and permit compliance**
  - MCLs generally drive effluent limitations for discharges (municipal treatment systems, stormwater, etc.

PFAS listed as CERCLA hazardous substance

Who?

- Parties responsible for releases of PFAS
- Federal and State agencies with delegated CERCLA authority
- Will impact Superfund, Brownfields, and misc. cleanup programs

What?

- Release reporting / notification requirements under CERCLA and Section 304 of EPCRA
- Possible new cleanup site requirements
- Initial focus is on PFOA and PFOS (including salts and isomers).

When?

- Final Rule published April 19, 2024
- Implications will evolve over time

How?

- Still evolving. Enforcement Discretion Memo focuses on those who "*significantly contributed to the release of PFAS.*"
- Will follow generally established CERCLA process but implies more discretion for PFAS

PFAS under CERCLA

What does it mean to me?

Most discretionary of new PFAS regulatory requirements but big potential impact

<u>Possible</u> impacts of CERCLA PFAS rule:

- New sites or additional cleanup requirements added to Superfund, Brownfield Programs, etc.
- Increased due diligence concerns complicating property transactions
- Additional DOT requirements for transportation of certain products
- Likely significantly more litigation between parties over cleanups

Poll Question 2:

Which emerging PFAS regulations will have the greatest impact on your business in the next 3 years?

1. TSCA, TRI or other use reporting type regulations
2. Inclusion of PFAS as a CERCLA hazardous substance impacting remediation & due diligence
3. Formal PFAS MCLs impacting water quality and spin off discharge regulations
4. PFAS regulations probably won't have any significant impact

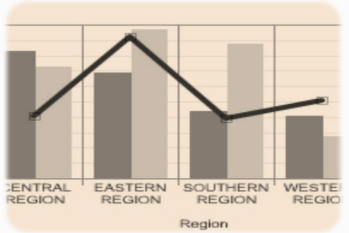
PFAS risk mitigation strategy:

Considerations to manage your assets and reduce your potential liabilities

“The first step in solving any problem is recognizing there is one”

Will McAvoy,
The Newsroom, HBO

Effective PFAS risk mitigation strategy



Identify PFAS in Your Organization

- Identify PFAS routes of entry
- Establish PFAS baseline

Prioritize PFAS Risk Concerns

- Cost-Benefit Approach
- Consider present & future

Implement Corrective Measures

- Balance with business needs
- Prioritize ROI for initiatives

Track and Reassess Effectiveness

- Honestly evaluate performance
- Don’t be afraid to regroup

PFAS baseline assessment

Identify PFAS in Your Organization | Prioritize PFAS Risk Concerns | Implement Corrective Measures | Track and Reassess Effectiveness

Understanding where PFAS enter your organization, where they are used in your operations, and how they leave your organization is critical to effectively managing your risks

Scope of PFAS baseline assessment

- Evaluate your supply chain
- Understand your processes
- Update and reconcile your inventory mgmt.
- Calculate PFAS levels
- Identify PFAS in products or wastes leaving the organization

Benefits of prioritizing the assessment

- Optimize your supply chain
- Find inefficiencies or beneficial alternative products
- Reduce costs of purchases
- Setup processes for required PFAS reporting to maximize future ROI
- Reduce potential liabilities

Prioritizing PFAS risks

- Priorities for every organization or business activity will be different - one size does NOT fit all
- Realistically consider return on investment and facts, not hype
- Start with business objectives and work backwards to design PFAS program requirements
- Critical to *quantify* risks and not only discuss risk *qualitatively*
    - There are opportunities to reduce risks while also improving operations

Examples and benefits of risk prioritization

- Transactional due diligence scope changes to address PFAS contamination under CERCLA
- Understanding PFAS inventory/imports to meet reporting requirements
- Reviewing impact of PFAS on wastewater and stormwater permits/programs
- Sufficiency of training for staff to identify PFAS concerns reduces risk and improve worker well being

PFAS corrective measures

Identify PFAS in Your Organization | Prioritize PFAS Risk Concerns | **Implement Corrective Measures** | Track and Reassess Effectiveness

Common examples

- Upgrade data management & inventory systems for reporting
- Optimize supply chain to eliminate PFA at the source where possible
- Where elimination isn't an option:
  - Upgrades to pre-treatment systems
  - Training programs to prevent unintentional noncompliance
  - Worker protection protocol changes

- Baseline assessment will be basis of corrective measures
- Focus on the following:
  - Immediate threats to human health or environment
  - Regulatory compliance
  - "Bang for the Buck" – Cost/Benefit evaluation models

PFAS program tracking

Identify PFAS in Your Organization | Prioritize PFAS Risk Concerns | Implement Corrective Measures | **Track and Reassess Effectiveness**

- Formally track PFAS in and PFAS out of organization
- Identify baseline and compare "*before and after*" when implementing corrective measures
- Tracking needs vary by stakeholder
    - Tiered data summaries often needed
- Use tracking to optimize programs

Poll Question 3:

Do you feel your organization is prepared to understand and manage its PFAS risks?

1. We haven’t really started looking at the issue seriously
2. We have initiated some risk management activities but have a lot of work ahead
3. We have a good strategy but may be resource limited to implement it effectively
4. We are already effectively managing PFAS risks

Questions?

BSI Consulting and EHS Today

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