



***The continued importance of antimicrobial pesticides for  
controlling microbial contamination in industrial process  
fluids and systems***

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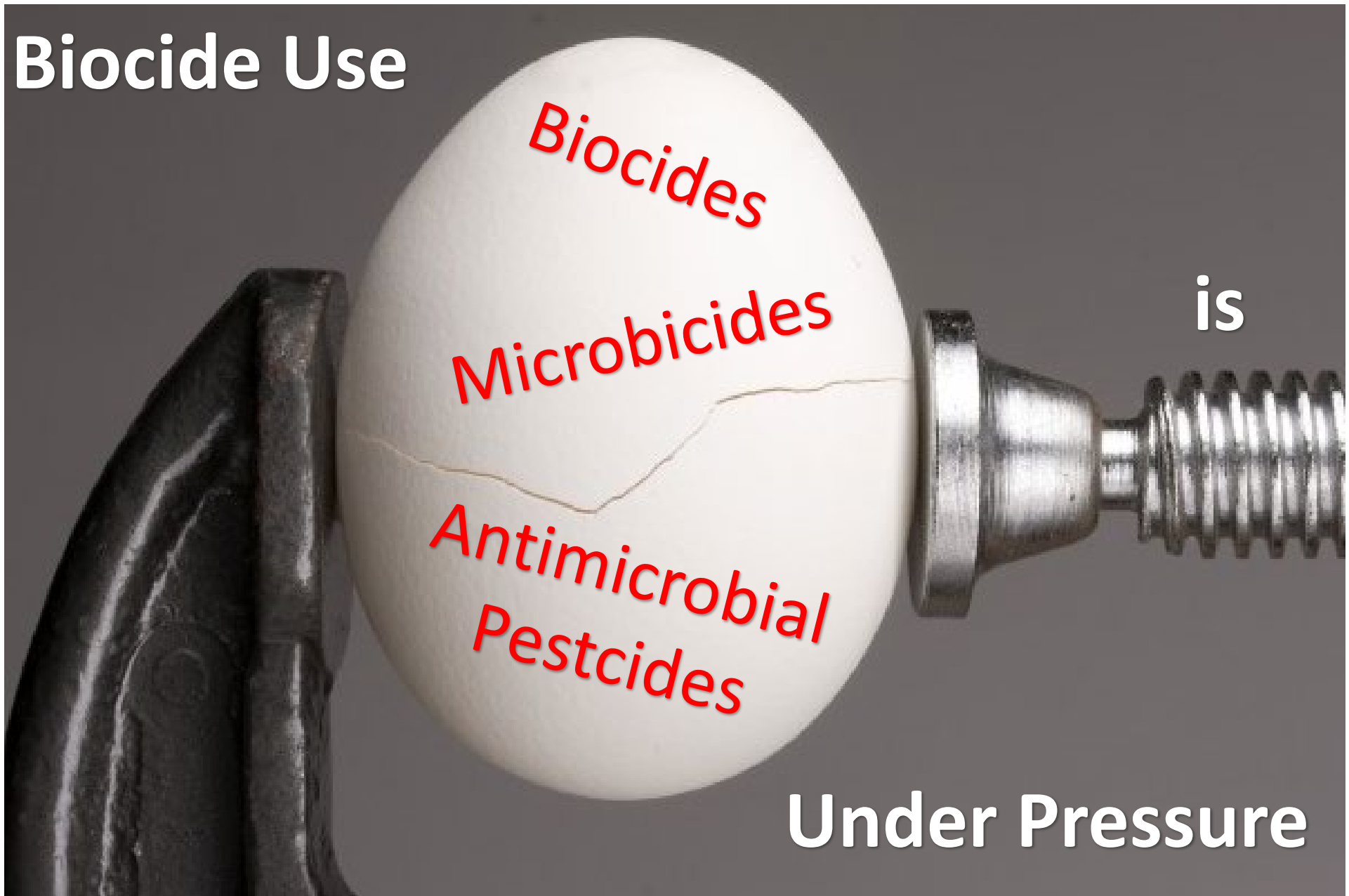
**Biocide Use**

*Biocides*  
*Microbicides*

*Antimicrobial*  
*Pesticides*

**is**

**Under Pressure**



# Microbicides

*Preserve Fluids*



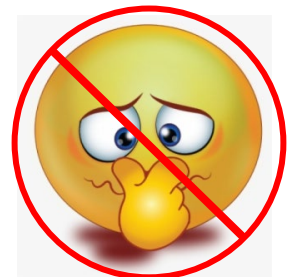
*Protect Surfaces*



*Control Bioaerosols*



*Control Odors*





## ***February 2023 Position Paper***

**Although there are chemical hazards associated with the use of biocidal products...  
UEIL's position is that these can be effectively managed so that ...  
cost and sustainability outweigh the risks of the use of these highly regulated products.**

**1. Biocides are key ingredients to control microbial growth.**

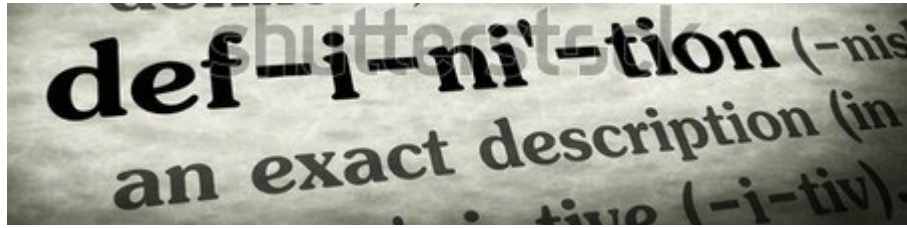
**2. Biocides are among the most controlled substances in the European Union.**



**def-i-ni-tion** (-nis)  
an exact description (in  
...tive (-i-tiv).







- **Biocidal Products Regulation (REGULATION (EU) No 528/2012 Article 3**
  - **Biocidal product definition:**



Any substance or mixture, in the form in which it is supplied to the user, consisting of, containing or generating one or more active substances, with the intention of destroying, deterring, rendering harmless, preventing the action of, or otherwise exerting a controlling effect on, any harmful organism by any means other than mere physical or mechanical action.



- **BPR**
  - **Biocidal product definition:**



**Any substance or mixture**, in the form in which it is supplied to the user, consisting of, containing or generating one or more active substances, with the intention of destroying, deterring, rendering harmless, preventing the action of, or otherwise exerting a controlling effect on, any harmful organism by any means other than mere physical or mechanical action.



- BPR
  - Biocidal product:



Any substance or mixture, in the form in which it is supplied to the user, consisting of, **containing or generating one or more active substances**, with the intention of destroying, deterring, rendering harmless, preventing the action of, or otherwise exerting a controlling effect on, any harmful organism by any means other than mere physical or mechanical action.





- **BPR**
  - **Biocidal product:**



Any substance or mixture, in the form in which it is supplied to the user, consisting of, containing or generating one or more active substances, **with the intention of destroying, deterring, rendering harmless, preventing the action of, or otherwise exerting a controlling effect on**, any harmful organism by any means other than mere physical or mechanical action.

***Is there any other reason to use biocides?***



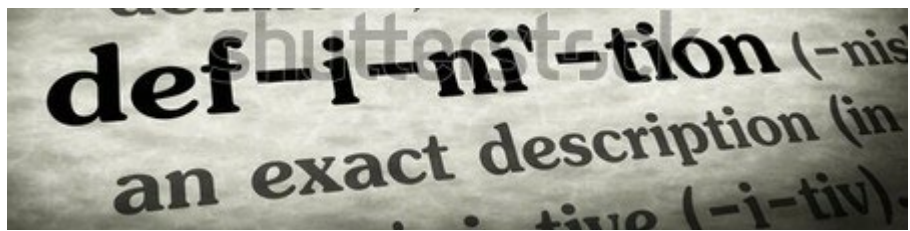


- **BPR**
  - **Biocidal product:**



**Any substance or mixture**, generated from substances or mixtures which do not themselves fall under the first indent, to be used with the intention of destroying, deterring, rendering harmless, preventing the action of, or otherwise exerting a controlling effect on, any harmful organism by any means other than mere physical or mechanical action.

***Here we go again...***



- BPR
  - Biocidal product:



***Now wait for it...***

Any substance or mixture, **generated from substances** or mixtures **which do not themselves fall under the first indent**, to be used with the intention of destroying, deterring, rendering harmless, preventing the action of, or otherwise exerting a controlling effect on, any harmful organism by any means other than mere physical or mechanical action.

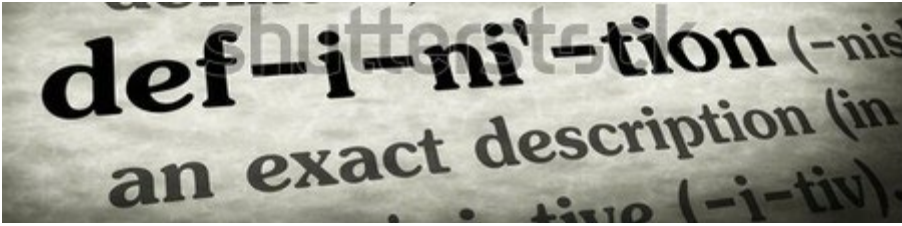
# Microbicide Regulatory Roulette Wheel



- BPR
  - Biocidal product:



Any substance or mixture, generated from substances or mixtures which do not themselves fall under the first indent, to be **used with the intention of** destroying, deterring, rendering harmless, **preventing the action of**, or otherwise exerting a controlling effect on, **any harmful organism** by any means other than mere physical or mechanical action.



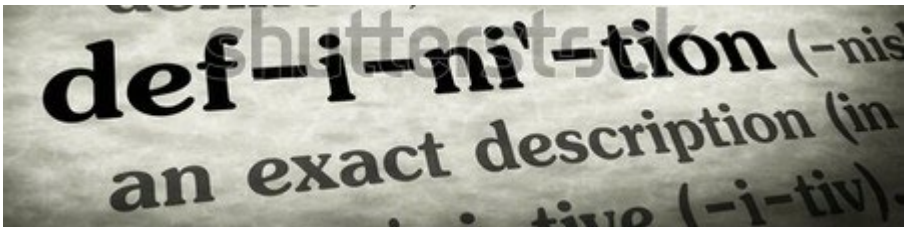
- BPR
  - Treated articles (yes, it gets even better):



“Treated article” means **any substance, mixture or article** which has been treated with, or intentionally incorporates, one or more biocidal products. It shall be noted that a treated article that has a primary biocidal function shall be considered a biocidal product.

***Round 3...***





- **BPR**
  - **Treated articles (yes, it gets even better):**



“Treated article” means any substance, mixture or article **which** has been treated with, or **intentionally incorporates, one or more biocidal products**. It shall be noted that a treated article that has a primary biocidal function shall be considered a biocidal product.

***Wait! Didn't we just learn: “Any ...mixture...supplied to... preventing the action of...any...organism...”???***



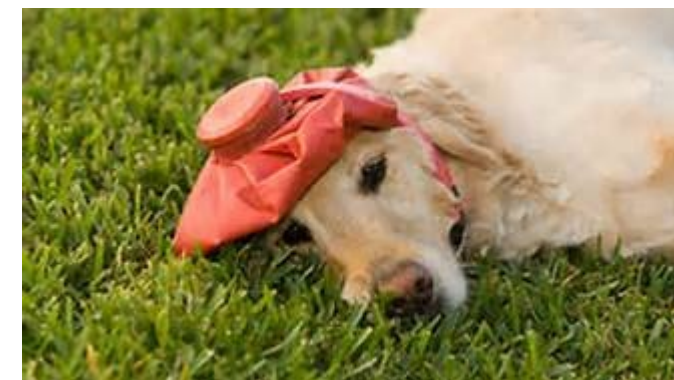


- BPR
  - Treated articles:



“Treated article” means any substance, mixture or article which has been treated with, or intentionally incorporates, one or more biocidal products. It shall be noted that **a treated article that has a primary biocidal function shall be considered a biocidal product.**

***UEIL: MWF are treated articles –  
biocidal function is not primary***



# Microbicide Regulatory Roulette Wheel



- BPR

- Treated articles:



The label must provide/ display the following information:

(a) a **statement** that the treated article incorporates biocidal products;

# Microbicide Regulatory Roulette Wheel



- BPR
  - Treated articles:



The label must provide/ display the following information:

- (a) a **statement** that the treated article incorporates biocidal products;
- (b) where substantiated, the **biocidal property** attributed to the treated article;

# Microbicide Regulatory Roulette Wheel



- BPR
  - Treated articles:

The label must provide/ display the following information:

- (a) a **statement** that the treated article incorporates biocidal products;
- (b) where substantiated, the **biocidal property** attributed to the treated article;
- (c) without prejudice to Article 24 of Regulation (EC) No 1272/2008 (CLP) concerning alternate names used to preserve confidentiality, the **name of all active substances** contained in the biocidal products;



# Microbicide Regulatory Roulette Wheel



- BPR

- Treated articles:

The label must provide/ display the following information:

- (a) a **statement** that the treated article incorporates biocidal products;
- (b) where substantiated, the **biocidal property** attributed to the treated article;
- (c) without prejudice to Article 24 of Regulation (EC) No 1272/2008 (CLP) concerning alternate names used to preserve confidentiality, the **name of all active substances** contained in the biocidal products;
- (d) the name of all nanomaterials contained in the biocidal products, followed by the word "nano" in brackets; and,**





# Microbicide Regulatory Roulette Wheel



- **BPR**

- **Treated articles:**

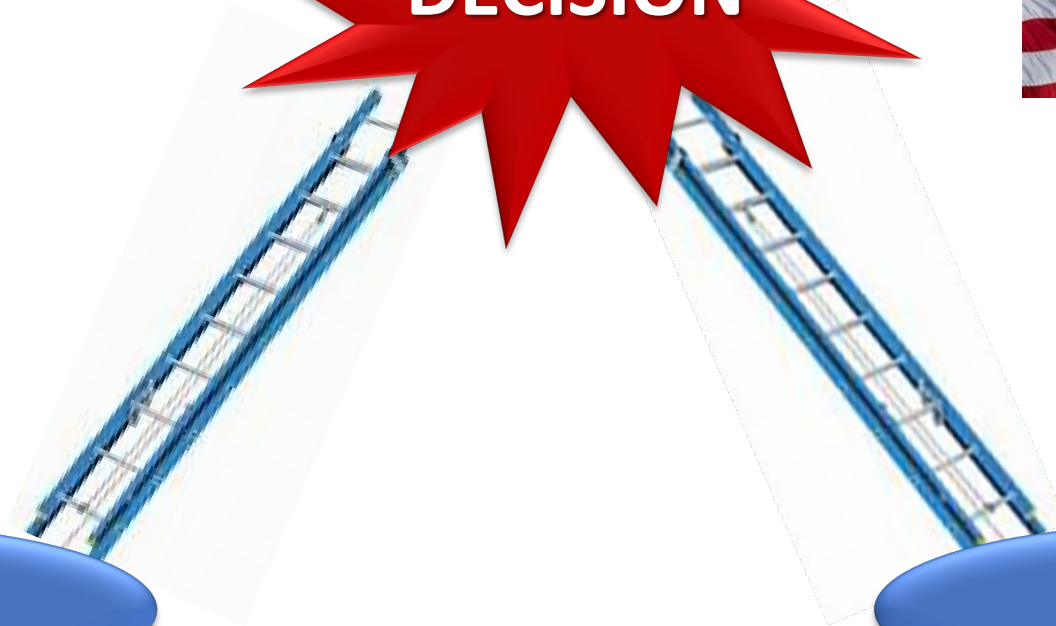
The label must provide/ display the following information:

- (a) a **statement** that the treated article incorporates biocidal products;
- (b) where substantiated, the **biocidal property** attributed to the treated article;
- (c) without prejudice to Article 24 of Regulation (EC) No 1272/2008 (CLP) concerning alternate names used to preserve confidentiality, the **name of all active substances** contained in the biocidal products;
- (d) the name of all nanomaterials contained in the biocidal products, followed by the word "nano" in brackets; and,
- (e) any **relevant instructions** for use, including any precautions to be taken because of the biocidal products with which a treated article was treated or which it incorporates.

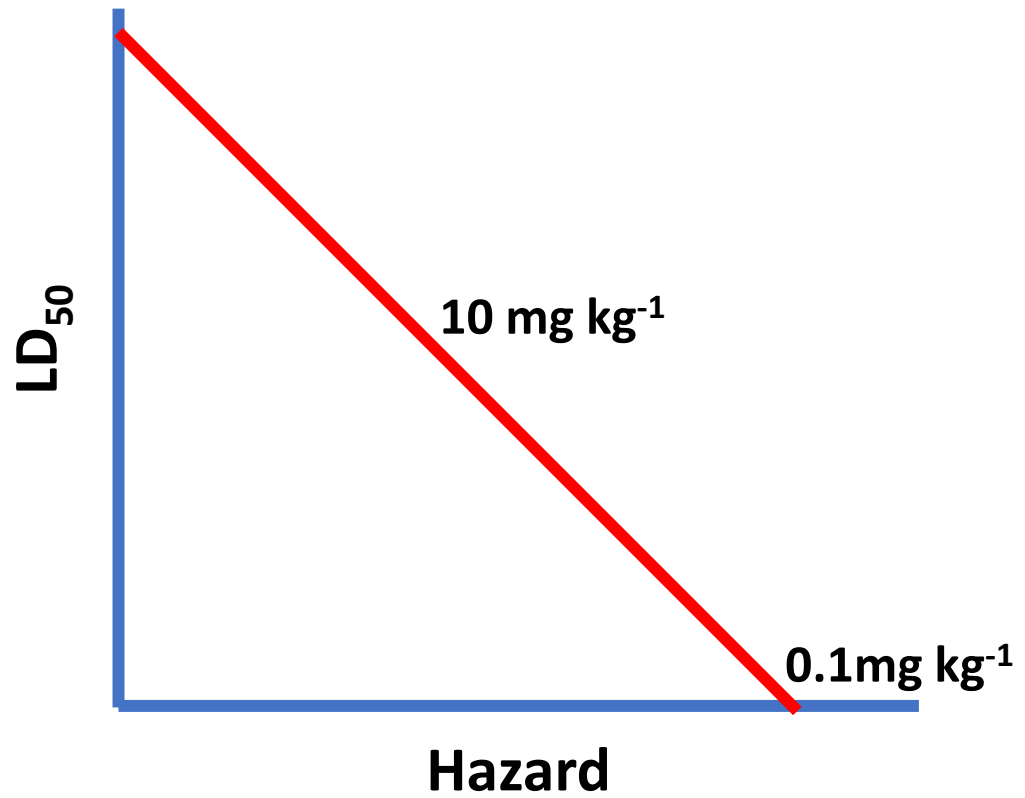




# Global Harmonization?

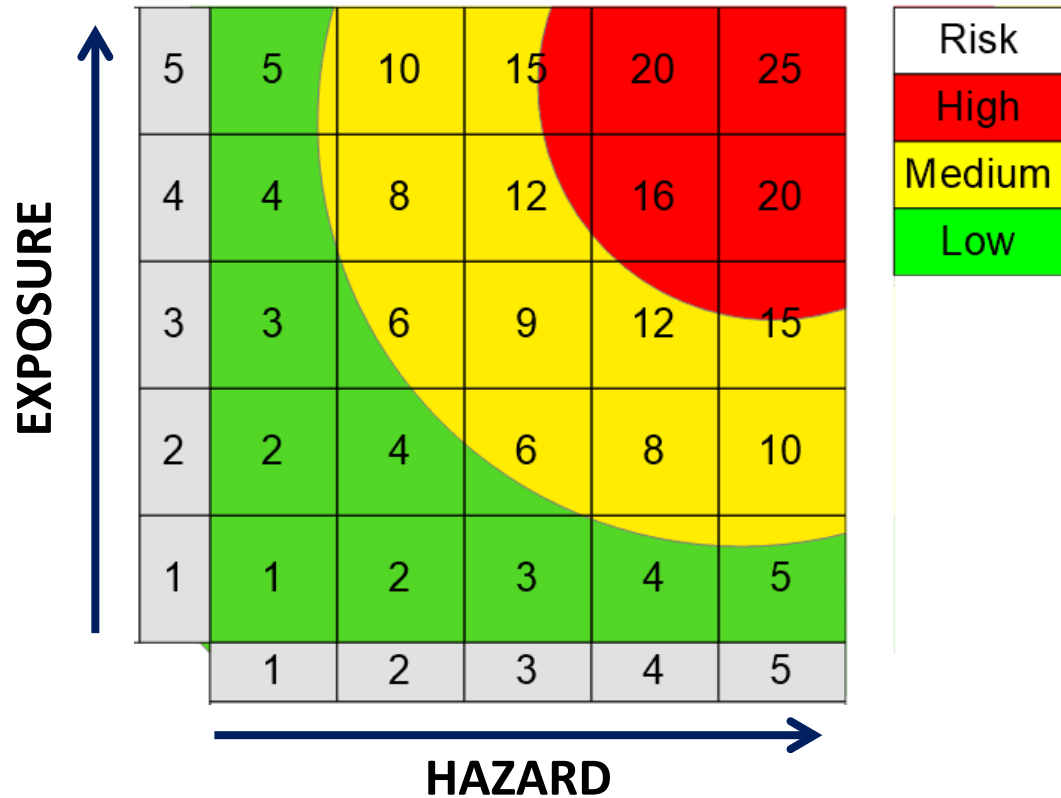


# HAZARD



# RISK

$$\text{Risk} = \text{Hazard} \times \text{Exposure}$$







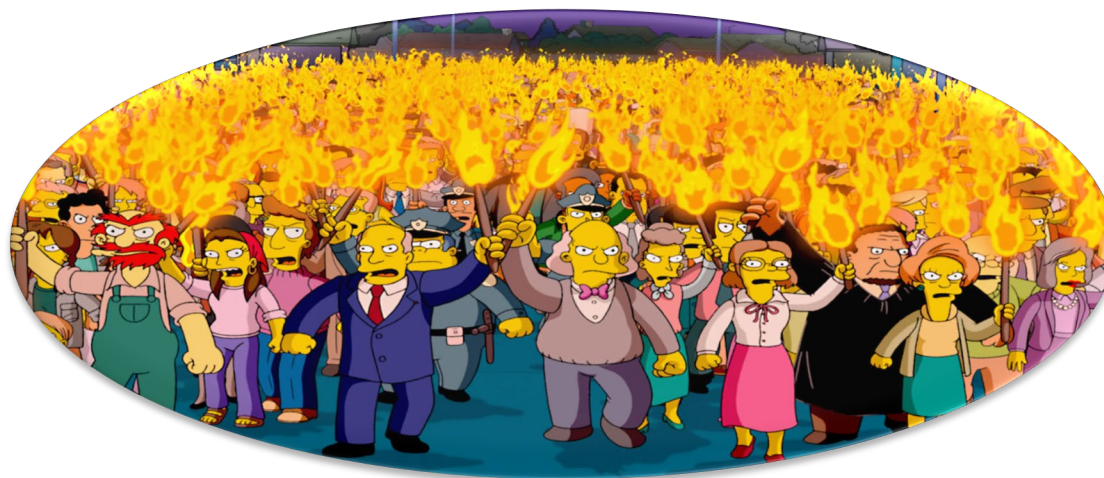
**RISK**

**Damage**





**BIOCIDE!!**



# Toxicological Testing Requirements

**Acute Toxicity**

**Sub-chronic Toxicity**

**Ecotoxicity**

**Biodegradability**



# Where do we go from here?



# Where do we go from here?



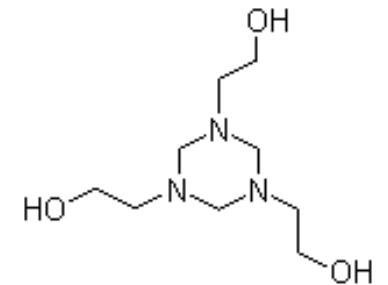
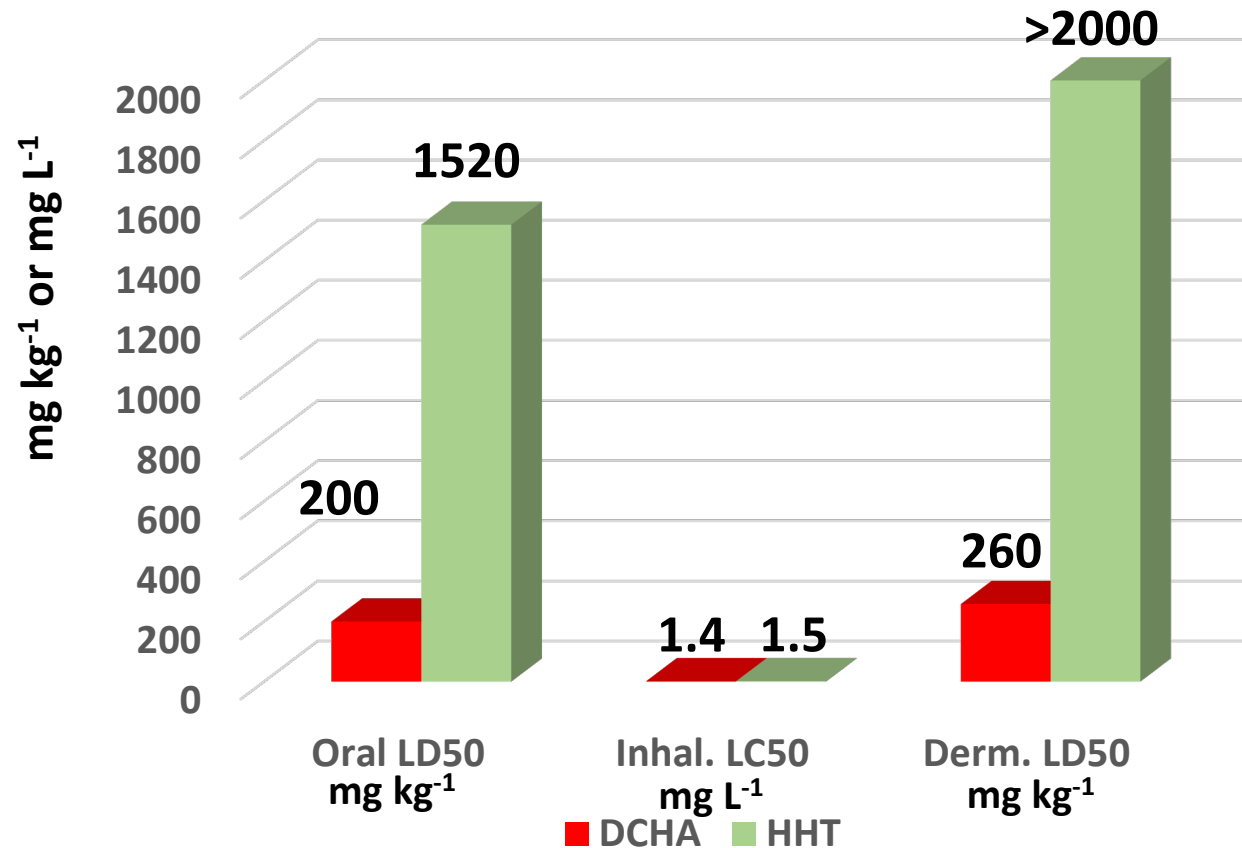
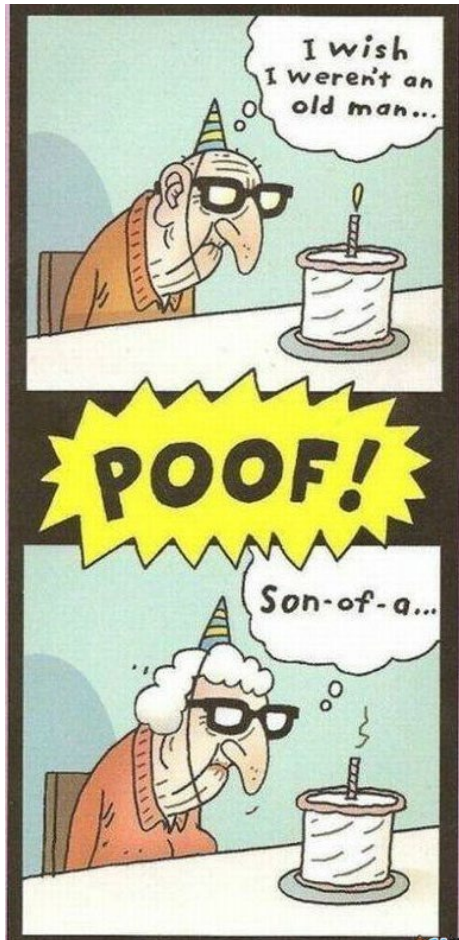




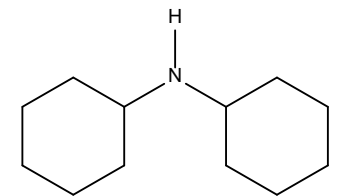
# Where do we go from here?

**Biocide-Free?**

Less toxic?



**Triazine  
(HHT)**



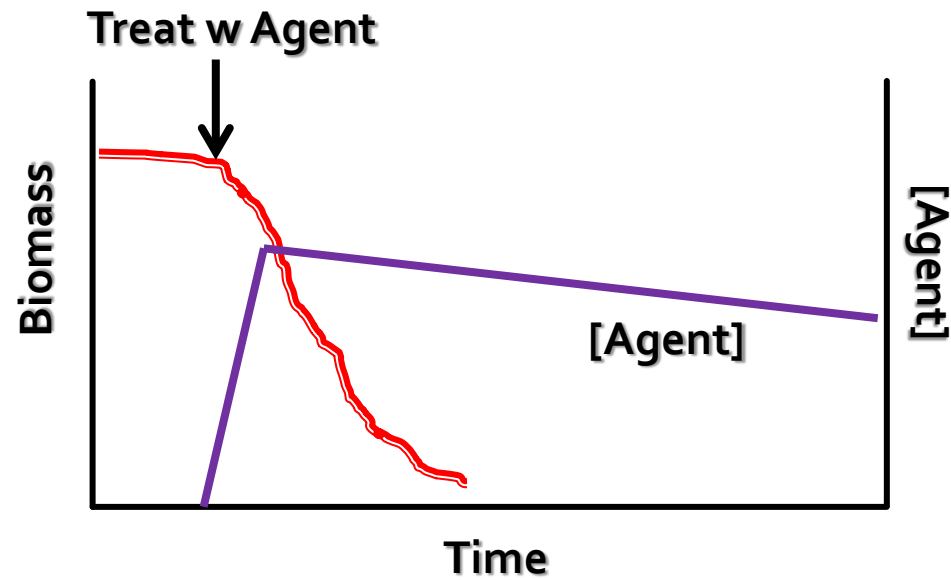
**Dicyclohexylamine  
(DCHA)**



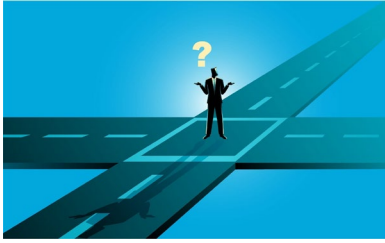
# Where do we go from here?

Biocide-  
Free?

If an agent  
does  
this...



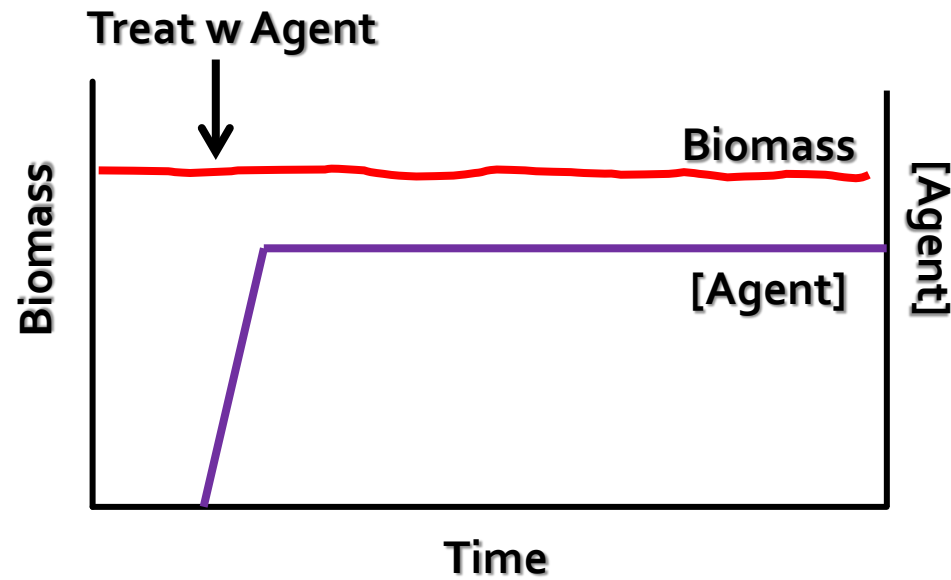
...it is  
an  
*active substance*



# Where do we go from here?

Biocide-  
Free?

If an agent  
does  
this...



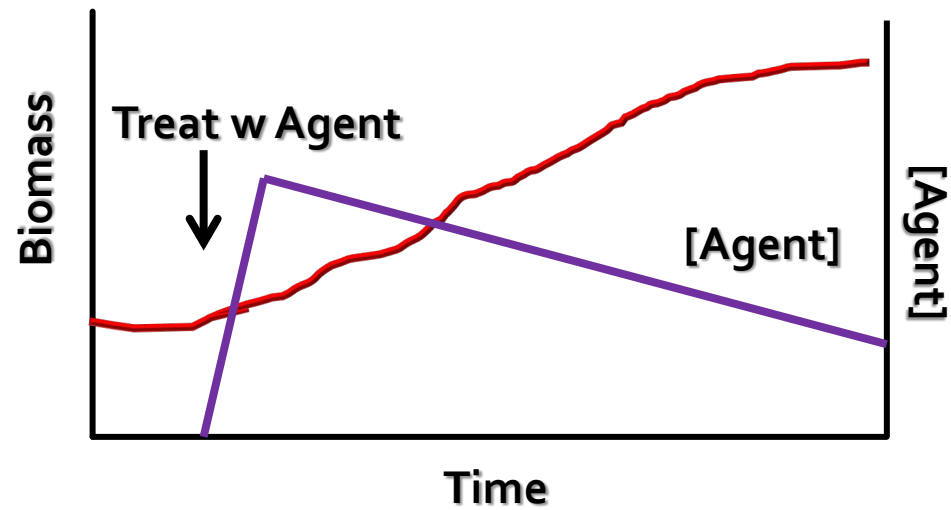
...it is  
a  
*recalcitrant*  
molecule



# Where do we go from here?

Biocide-  
Free?

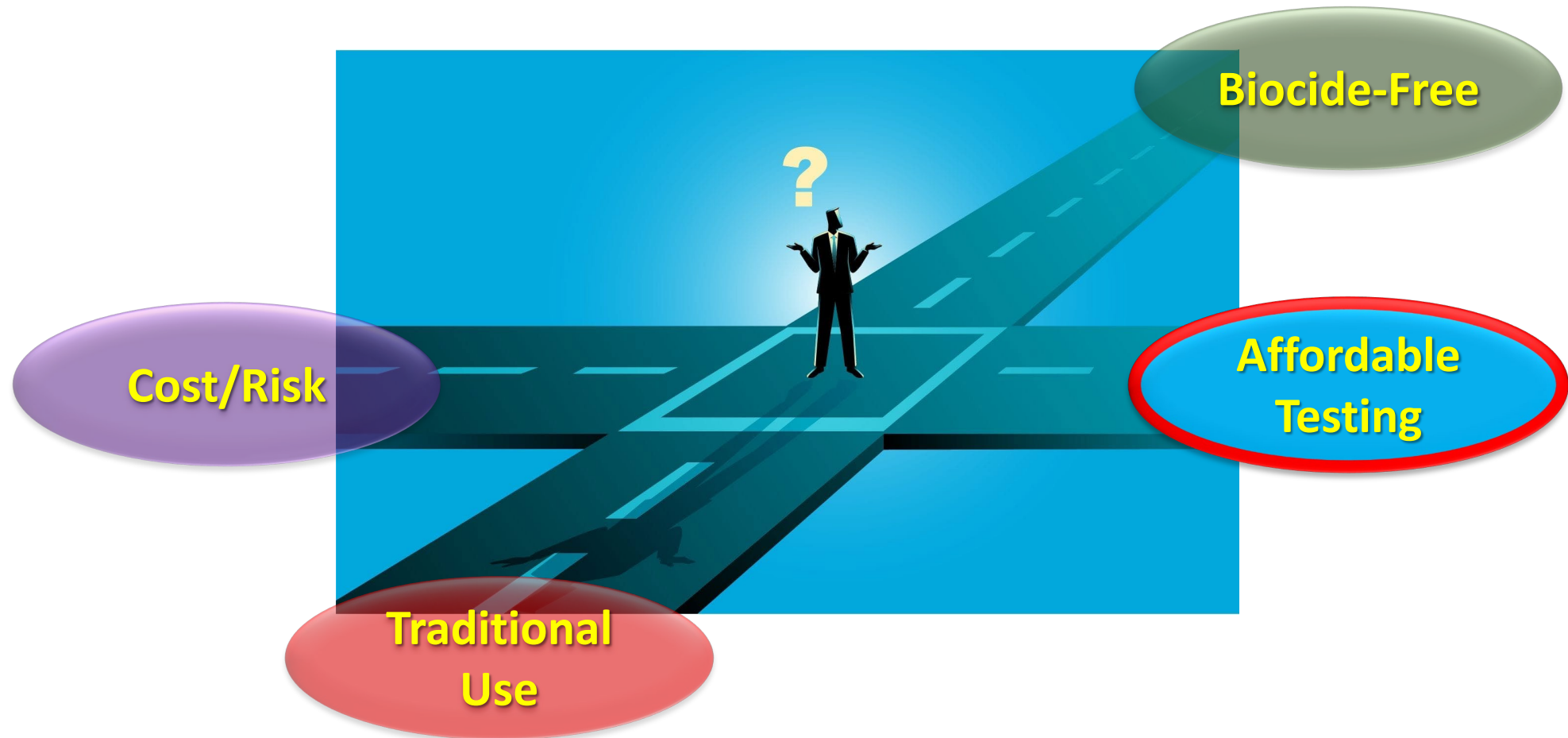
If an agent  
does  
this...



...it is  
a  
*biodegradable*  
molecule



# Where do we go from here?





# Where do we go from here?

**Affordable  
Testing**





# Where do we go from here?

Affordable  
Testing

INDUSTRIAL  
CHEMICAL  
(ECHA)



BIOCIDAL  
PRODUCT  
(BPR)

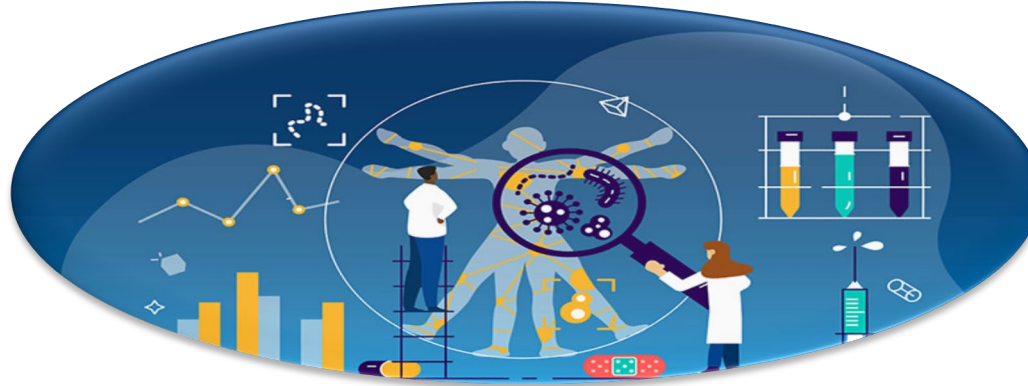
# Where do we go from here?





# Where do we go from here?

Traditional  
Use



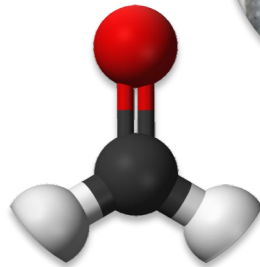
Has historical use caused adverse health effects?

Pb



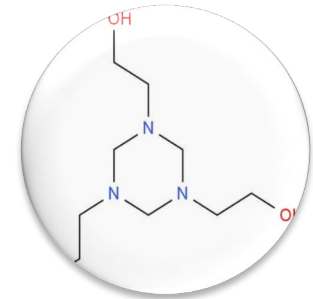
YES

HCHO



Hg

NO



HCHO-Condensates

# Where do we go from here?

Traditional  
Use



Is molecule biopersistent, bioaccumulative, both?

Pb

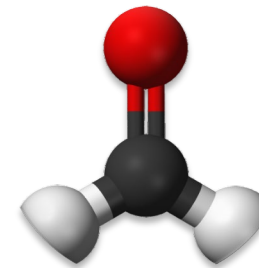


YES

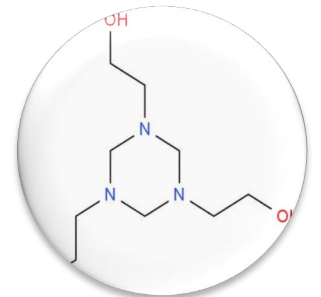


Hg

NO



HCHO



HCHO-  
Condensates

# Where do we go from here?

**Traditional  
Use**



**Is exposure likely?**

**HI&I**



**Toys**

**YES**

**NO**

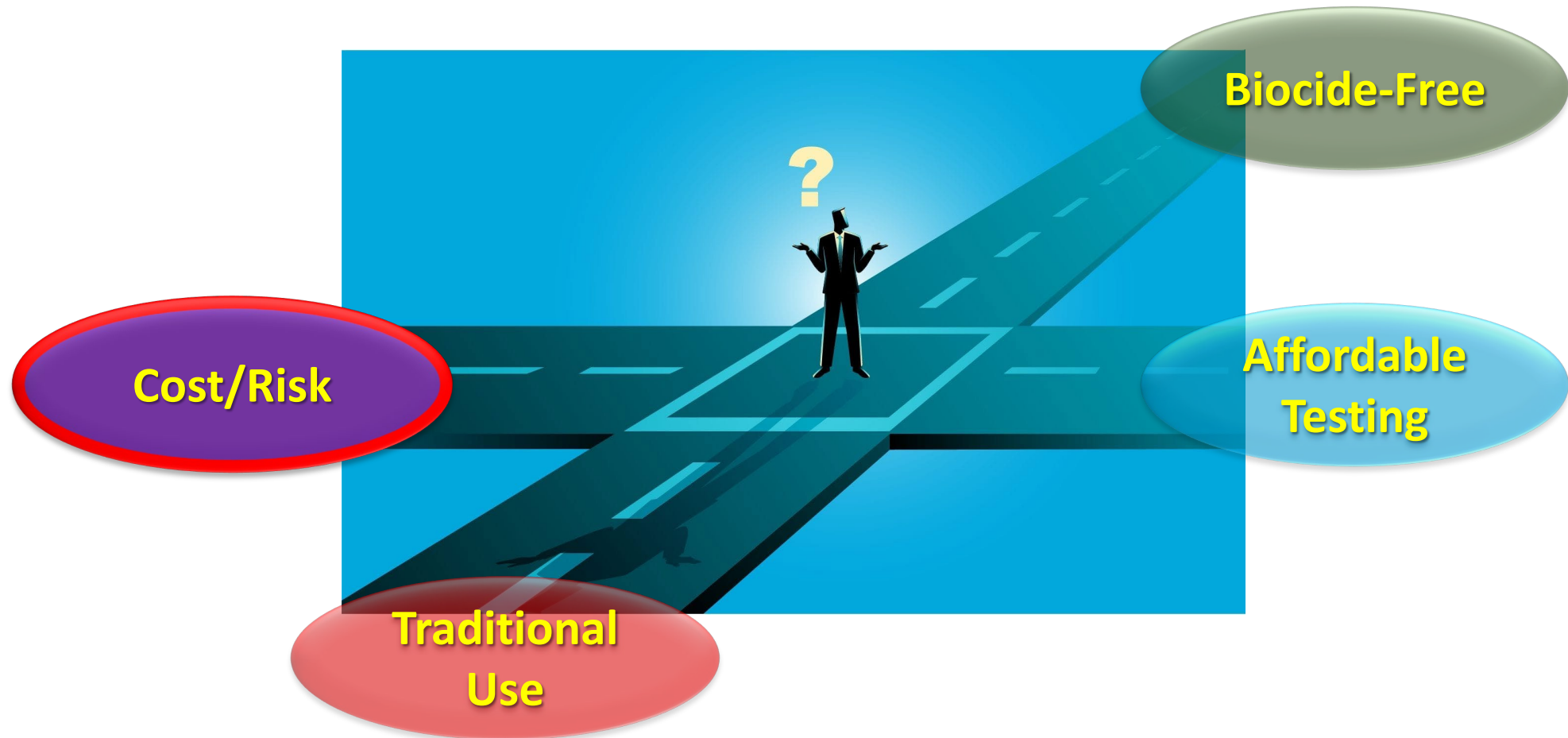


**Lubes**



**Industrial  
Coatings**

# Where do we go from here?





# Where do we go from here?

Cost/Risk

~~HAZARD~~

RISK



# Where do we go from here?

**Cost/Risk**

**MIC –**  
**>\$100 Billion (U.S.)**

**MWF Failure –**  
**\$100 000(U.S.)/event**  
**Contact exposure**

**Buildings –**  
**>\$100 Billion (U.S.)**  
**Contact exposure**



**Safer Infrastructure**  
**Extended functional life**

**MWF –**  
**Reduced wastes**  
**↑ Productivity**  
**↓ Bioaerosols**

**Buildings –**  
**>\$100 Billion (U.S.)**  
**↓ microbe exposure**  
**↓ allergies**

**FEWER CHOICES**



**MORE  
REGULATION**

***The  
Path  
Ahead***



IF BIOCIDES  
DISAPPEAR



$V_{\text{WASTE}}$  ↑↑

[BIOAEROSOL] ↑

TOXIC ADDITIVE  
EXPOSURE ↑

ALLERGENIC  
DISEASES ↑

COSTS ↑

*The  
Path  
Ahead*



**EDUCATE**

**RISK v. BENEFIT**

**LOW TOXICITY**

**NON-PERSISTENT**

**NON-  
BIOACUMULATIVE**



***The  
Path  
Ahead***