

## Breakdown (degradation) of Deca-BDE

In the environment the Deca-BDE molecule may change, breaking-down into more toxic forms of PBDEs, namely Penta-BDE and Octa-BDE. These two forms of PBDEs are more toxic and build up in people and animals (i.e. bioaccumulate).

### Evidence of Deca-BDE breakdown:

A number of scientific studies on the degradation of Deca-BDE have been conducted in recent years. The Departments of Ecology and Health conducted a thorough review of these studies. We relied on studies that were published in peer reviewed, reputable journals. Studies have focused both on the different conditions needed for Deca-BDE breakdown and on what the breakdown products are. See the PBDE Chemical Action Plan for more detail at [www.flameretardant.org](http://www.flameretardant.org).

- 21 different studies found that Deca-BDE breaks down in sunlight. 7 of these studies were conducted under conditions designed to mimic the environment. For example, Deca-BDE was found to break down in sunlight when mixed with sand or when mixed with water containing naturally occurring organic compounds.
- 7 of the 21 studies identified less brominated PBDE forms as Deca-BDE breakdown products.
- 8 studies found evidence that Deca-BDE breaks down due to biological activity. One study found that fish (carp) can breakdown Deca-BDE. 3 studies found that Deca-BDE will break down due to the activity of micro-organisms found in sewage sludges. One study suggests that Deca-BDE may also break down in sediments.
- 4 studies found breakdown products that included the same PBDEs that occur in commercial Penta and Octa-BDE mixtures. These mixtures are known persistent, bioaccumulative toxins (PBTs) that have been banned in Europe and in 8 states.

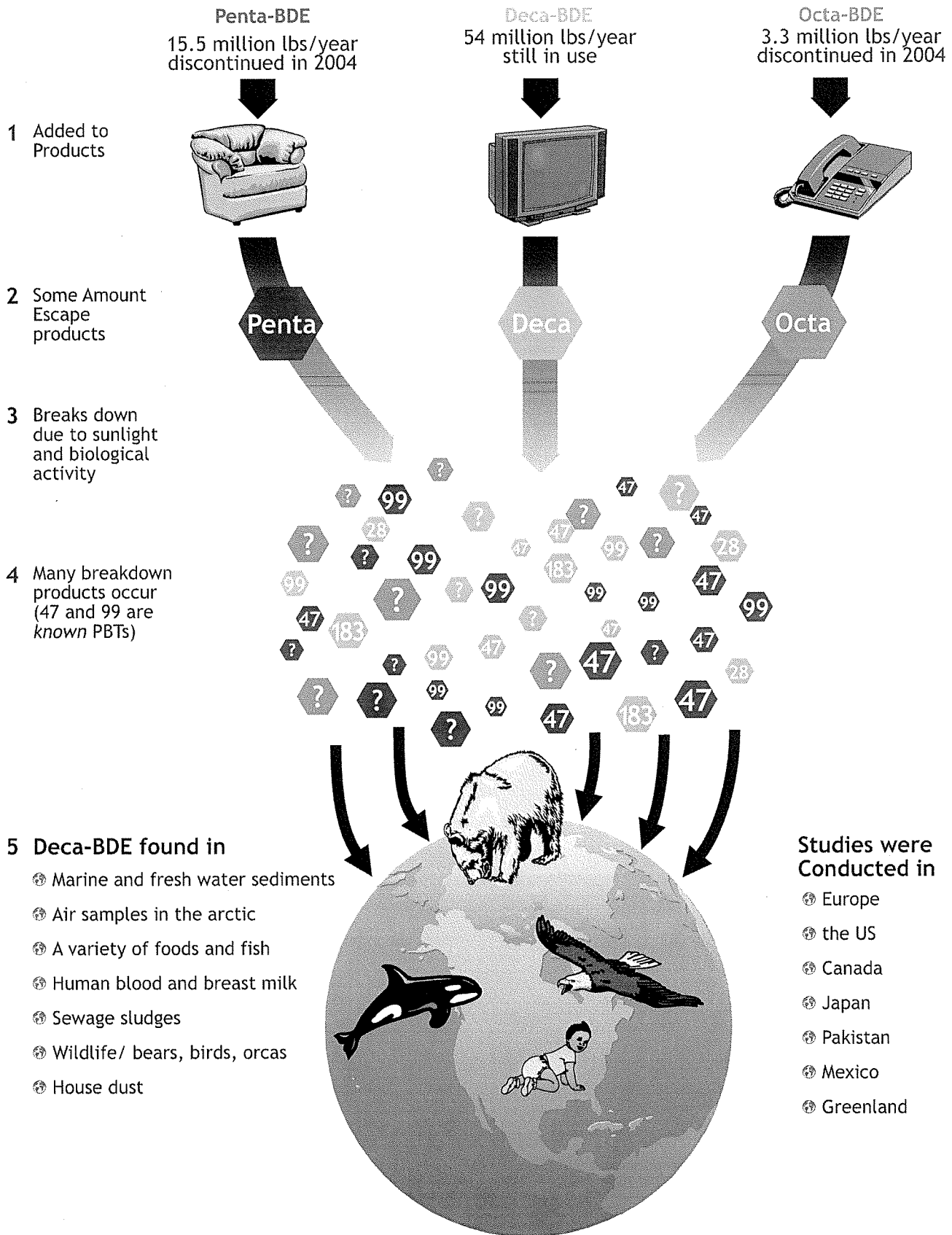
### Evidence of Deca-BDE release to the environment:

- Ecology and Health reviewed almost 200 studies regarding the presence of PBDEs
- These studies were conducted in Europe, the US, Canada, Japan, Pakistan, Mexico and Greenland.
- These studies found deca-BDE in:
  - Marine and fresh water sediments
  - Air samples in the arctic
  - A variety of foods and fish
  - Human blood and breast milk
  - Sewage sludges
  - Wildlife/ bears, birds, orcas
  - House dust

### **Conclusions**

After a thorough review of the literature, Ecology and Health concluded that Deca-BDE is likely to break down in the environment to more toxic and bioaccumulative forms of PBDEs. If Deca-BDE continues to be used, it will continue to be a source of PBDEs in the environment for some time. Ecology and Health believe it is prudent and reasonable to prevent the further build-up of PBDEs in the environment.

# Sources and Breakdown of PBDEs\*



\* This is a conceptual drawing only - See Chemical Action Plan (CAP) for more detail