



Substitution by an SME of Brominated Flame Retardants

Erwin Boëne
QES Manager CTF2000 NV, Belgium

13&14/11/2017
European Chemicals Agency, Helsinki

Why flame retardants?



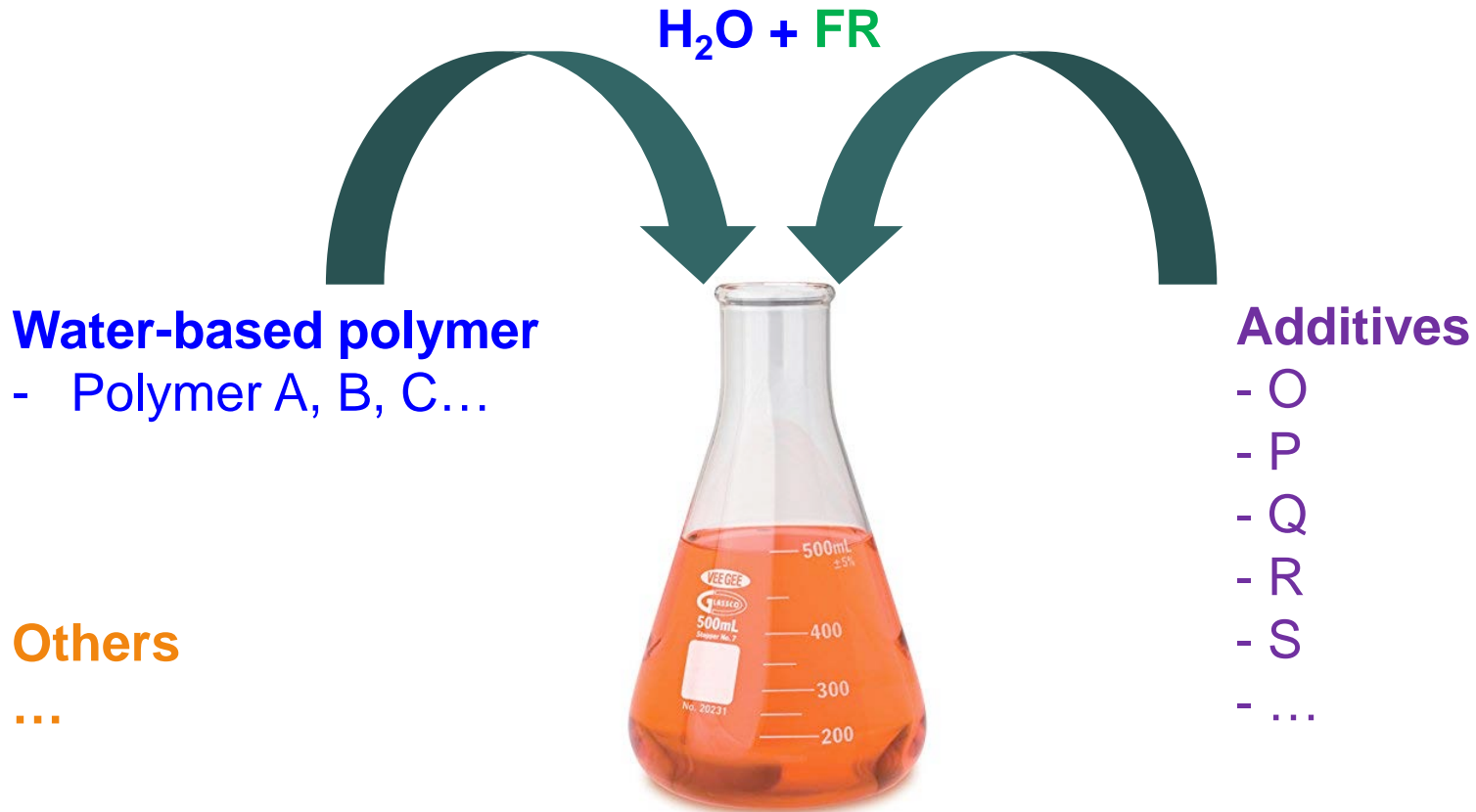
CTF2000

- Development and production of **flame retardant formulations** for textile industry
- Global sales: EU, Turkey, Asia, South-America, Australia,...
- In EU: 1 of the 6 main suppliers, market share 15-20%

CTF2000 NV	2006	2016	Evolution
Turnover (€)	± 8,4 million	± 25 million	x 3
Volume (tonnes)	± 6.500	± 15.000	x 2,3
Employees	± 15	± 45	x 3
R&D/Lab	± 4	± 15	x 3,75



Flame Retardant (FR) Formulation



Change **ONE** component = Change **COMPLETE** formulation!

Customers and Markets



Roles in Reach

- Roles: Mainly ‘**Downstream User**’ (formulator)

Downstream User	Total	SVHC (BrFR's)	CoRAP
Raw Materials	+/- 350	2 (out!)	7



Formulator	Total	Impact	
		SVHC (BrFR's)	CoRAP
2009	+/- 400	> 60 %	0 %
2017	+/- 450	0%	> 75 %

- Roles: ‘**Registrant**’

Registrant	2010	2013	2018
Producer	/	1 substance	/
Importer	/	/	1 intermediate 1 substance



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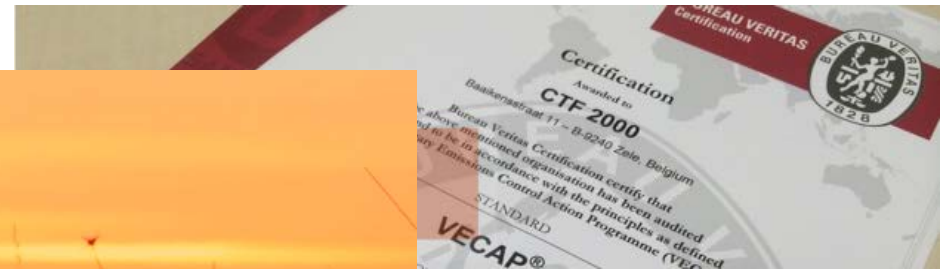
VLarIP

VLANDERENS REACH & CLP IMPLEMENTATIE PROJECT



Responsible Use

- ▶ Minimization of emissions → VECAP
 - BrFR Producer
 - **BrFR Formulator: 1st Certified Formulator**
 - BrFR Textile Coater



Responsible Care®
OUR COMMITMENT TO SUSTAINABILITY



EFRA



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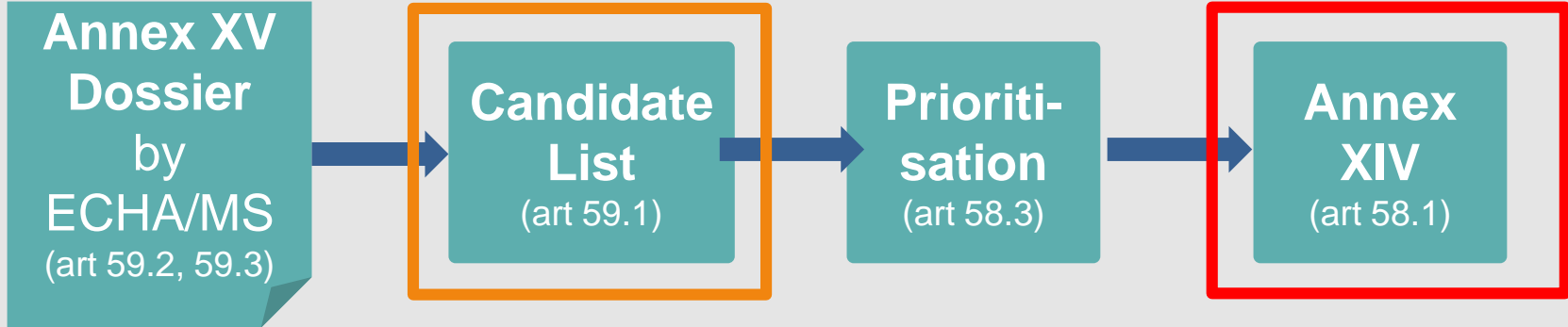


Avoid the Use of SVHC by early substitution

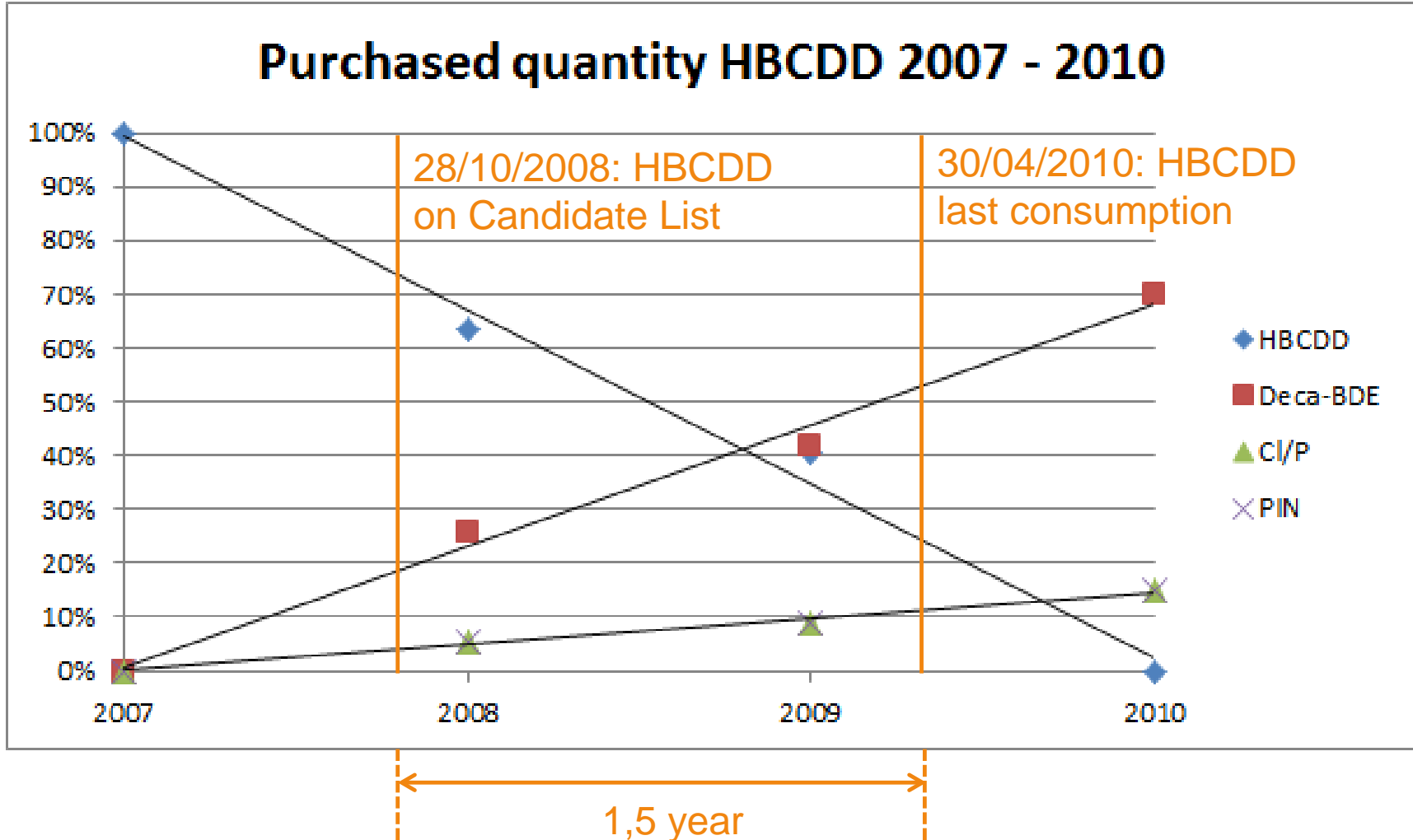
Timing of Substitution at CTF2000

→ Candidate listing

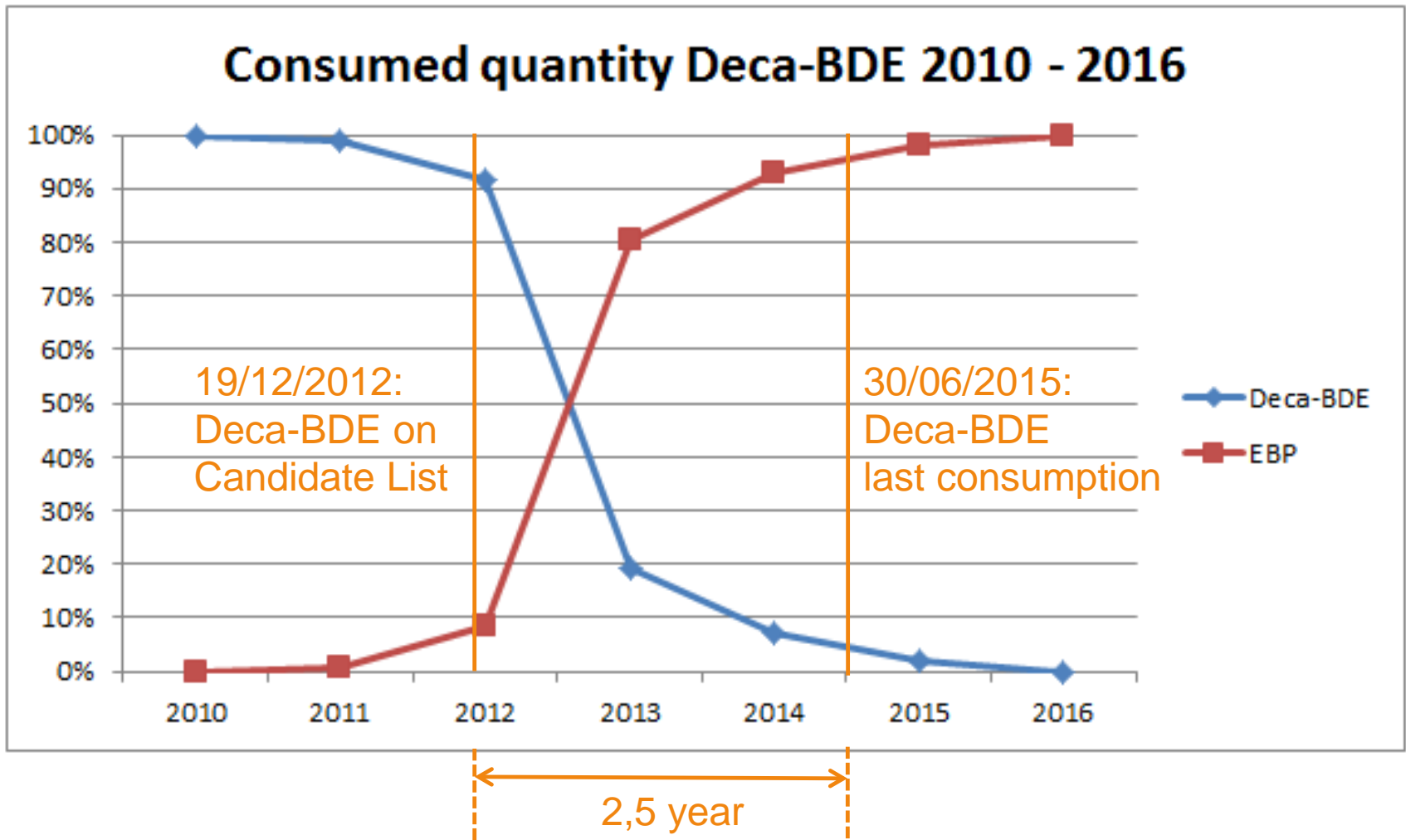
Process to list substances for authorisation (Annex XIV)



Substitution of HBCDD



Substitution of Deca-BDE



Drivers and Challenges for Substitution

- Main drivers:
 - More **sustainable** products
 - Pressure from our **customers**
 - **competitive advantage** of substitution
 - Authorization ?????

- Main Challenges:
 - Technical difficult → requires (re)formulation
 - Alternatives more expensive → requires (re)formulation
 - Requires Time & Money

Substitution of HBCDD

➤ Use of HBCDD:

- 20 formulations: 65 tpa (2007) → 25 tpa (2009) → 0 tpa (2010)

➤ Key features

- Many and specific

➤ Alternatives Multiple substitutions required:

- Deca-BDE (↑ %) + Sb₂O₃ or other synergists (70%) **temporary**
- Combination of Cl and P based (15%)
- Halogen free solutions (PIN Flame Retardants) (15%)

➤ Reduction of risk

- Formulation: 0 (emission free formulation)

➤ Costs

- **One time costs:** 200,000 €
- **Average price increase raw material:** Up to 10-20%

Substitution of Deca-BDE

➤ Use of Deca-BDE:

- 240 formulations: 800 tpa (2010) → 140 tpa (2013) → 0 tpa (2016)

➤ Key features

- General purpose FR for many applications

➤ Alternatives generally almost 1:1' by EBP:

- EBP (95%): **CoRAP**
- Specialties (15%)

➤ Reduction of risk

- Formulation: 0 (emission free formulation)

➤ Costs

- **One time costs:** 325,000 €
- **Average price increase raw material:** Up to 20%

Use of EBP – CoRAP

➤ Use of EBP:

- 280 formulation (>65 %): 1300 tpa (2017) → ?

➤ Key features

- General purpose FR for many applications

➤ Alternatives Multiple substitutions required:

- Brominated polymers (not on CL SVHC) (40%)
- Halogen free solutions (PIN Flame Retardants) (40%)
- Chlorinated substances (not on CL SVHC) (20%)

➤ Reduction of risk

- Formulation: 0 (emission free formulation)

➤ Costs

- **One time costs:** > 0,5 mio. €
- **Average price increase raw material:** Up to 20%



Timetable substitution Overview

	2006	2007	2008	2009	2010	2011	
HBCDD	x	x	SVHC	x	↓= 0		→ Authorisation
Deca-BDE	x	x	x	x	x	x	→ Restriction
EBP						x	→ CoRAP

	2012	2013	2014	2015	2016	2017	
HBCDD		POP		SUNSET DATE			→ Annex XIV, nr 3
Deca-BDE	SVHC	x	x	↓= 0			→ Annex XVII, nr 67
EBP	CoRAP	x	x	x	x	x	→ UK MS



What if?

- HBCDD, Deca-BDE and EBP at the same time on Annex XIV
 - No sequential substitution
- But:
 - No/Not enough alternatives at that time
 - R&D/reformulation/trials... not enough time!
 - ➔ Authorisation unavoidable



Conclusions

- Flame retardants are needed to achieve Fire safety
- CTF2000 NV formulates BrFR almost emission free (VECAP)
- HBCDD and Deca-BDE were substituted following candidate-listing
- Substitution:
 - a money (X00,000 euro) and time (y years) consuming process
 - involves complete supply chain
 - never 100% same technical excellence
 - often temporary solutions needed
 - This case: So far substitution of BrFR **has** happened
 - This case: So far a main objective (protection human health / protection environment) of Reach **has** worked