Table xx Reported Legacy SVOCs and novel, emerging or identified alternatives.

Author	Legacy	Novel/Emerging	Materials
Stockholm Convention [21]	Brominated Flame Retardants: DecaBDE (BDE 209)	Decabromodiphenyl ethane (DBDPE), Bisphenol A bis(diphenyl phosphate) (BDP/BAPP); Resorcinol bis(diphenylphosphate) (RDP); Ethylene bis(tetrabromophthalimide) (EBTBP); Magnesium hydroxide (MDH); Triphenyl phosphate (TPP); Aluminium trihydroxide (ATH); Red phosphorous	Plastics
Stockholm Convention [21]	Brominated Flame Retardants: DecaBDE (BDE 209)	Aluminum trihydroxide (ATH); Magnesium hydroxide (MDH); Tris(1,3-dichloro-2-propyl) phosphate (TDCPP); Ethylene bis(tetrabromophthalimide) (EBTBP); 2,2'-oxybis[5,5-dimethyl-1,3,2-dioxaphosphorinane] 2,2'-disulphide; Tetrabromobisphenol A bis (2,3-dibromopropyl ether) (TBBPA) (only in polymer applications); Red phosphorous; Decabromodiphenyl ethane (DBDPE)	Textiles, building and construction materials, insulation materials, flooring materials
Stockholm Convention [21]	Brominated Flame Retardants: HBB	Organic phosphorus compounds including TCPP, TDCPP, TBBPA, TPP, TCP, RDP and phosphonic acid (2-((hydroxymethyl) carbamyl)ethyl)- dimethyl ester (Pyrovatex®)	Plastic
Stockholm Convention [21]	Brominated Flame Retardants: HBB	Ammonium polyphosphate (APP), Red phosphorus, melamine	Polyurethane foams
Stockholm Convention [21]	HBCDD	Alternatives include flame retardant substitution (DBDPE, EBTBP, APP), resin/material substitution and product redesign. Noted that one of the alternatives (decaBDE) are not permitted in all countries.	Textile back coatings
Stockholm Convention [21]	HBCDD	deca-BDE (not permitted in all countries); Tris(tribromoneopentyl) phosphate/ATO TBBPA-DBPE /ATO; 2,4,6-Tris(2,4,6-tribromophen oxy)-1,3,5 triazine/ATO; Ethane-1,2-bis(pentabromophenyl)/ ATO; Ethylenebis(tetrabromop htalimide)/ATO;	Housing of electronic products, wiring parts
Stockholm Convention [21]	Brominated Flame Retardants: Hexabromodiphenyl ether and heptabromodiphenyl ether (BDE 153, 154, 175, 183)	tetrabromobisphenol-A (TBBPA); 1,2-bis(pentabromophenoxy) ethane; triphenyl phosphate; resourcinol bis (diphenylphosphate); brominated polystyrene.	Plastics
Stockholm Convention [21]	Brominated Flame Retardants: Hexabromodiphenyl ether and heptabromodiphenyl ether (BDE 153, 154, 175, 183)	reactive phosphorous constituents and hexabromocyclododecane (HBCD)	Synthetic textiles

Table xx Reported Legacy SVOCs and novel, emerging or identified alternatives.

Author	Legacy	Novel/Emerging	Materials
Stockholm Convention [21]	α-HCH	alpha-HCH is only produced unintentionally during the production of lindane. Releases also occur from stockpiles and contaminated sites.	
Stockholm Convention [21]	Agricultural, livestock and veterinary use: Lindane	Several alternatives including permethrin	Insecticide, wood protector,
Stockholm Convention [21]	PFOA	availability of alternatives considering efficacy and efficiency indicates that appropriate alternatives may currently not be available for several uses. However commercially fluorine free foams are available for fire-fighting.	
Stockholm Convention [21]	Insecticide: Endosulfan	a number of alternatives to endosulfan (including plant extracts) are available for specific crop-pest combinations	
Stockholm Convention [21]	TetraBDE and Penta BDE	Melamine, TDCPP or TCPP and APP	PUR foam
Stockholm Convention [21]	PFOS	For fire fighting foam alternatives are available or under development and include non-PFOS-based fluoro-surfactants; silicone based surfactants; hydrocarbon based surfactants; fluorine-free fire fighting foams; and other developing fire fighting foam technologies that avoid the use of fluorine. PFOS is widely used in the production of electric and electronic parts. Major uses are as sealing agents and adhesives. For these uses, alternatives are available or are under development, and PFOS will be replaced relatively quickly. However, several uses have been identified for which alternatives will not soon be available.	
Stockholm Convention [21]	Pesticide: Aldrin	No proposed alternative	
Stockholm Convention [21]	Pesticide: Dieldrin	No proposed alternative	

Table xx Reported Legacy SVOCs and novel, emerging or identified alternatives.

Author	Legacy	Novel/Emerging	Materials
Stockholm Convention [21]	Pesticide: Endrin	No proposed alternative	
Stockholm Convention [21]	Pesticide: Chlordane	No proposed alternative	
Stockholm Convention [21]	Pesticide: DDT	Alternatives proposed but not identified in concentrations	
Ali et al 2011 [103]	Brominated Flame Retardants: PBDE and HBCD	decabromodiphenyl ethane (DBDPE); 1,2-bis(2,4,6-tribromophenoxy)ethane (BTBPE); tetrabromobisphenol A-bis(2,3-dibromopropylether) (TBBPA-DBPE); 2-ethylhexyl-2,3,4,5-tetrabromobenzoate (EH-TBB); bis(2-ethylhexyl)-3,4,5,6-tetra-bromophthalate (TBPH); hexachlorocyclopentadienyl-dib-romocyclooctane (HCDBCO).	
Al-Omran et al 2018 [104]	Brominated Flame Retardants: PBDEs (BDE-28, BDE-47, BDE-99, BDE-100, BDE-153, BDE-154, BDE-183 and BDE-209)	pentabromoethylbenzene (PBEB); 2-ethylhexyl-2,3,4,5-tetrabromobenzoate (EH-TBB); bis (2-ethylhexyl) 3,4,5,6-tetrabromophthalate (BEH-TEBP); 2-bis (2,4,6-tribromophenoxy) ethane (BTBPE); decabromodiphenylethane (DBDPE)	
Cequier et al 2014 [38]	Brominated Flame Retardants: DecaBDE (BDE-209)	decabromodiphenyl ethane (DBDPE)	
Cequier et al 2014 [38]	Brominated Flame Retardants: OctaBDE (BDE-183) formulation	1,2-bis(2,4,6-tribromophenoxy)ethane (BTBPE)	
Cequier et al 2014 [38]	Brominated Flame Retardants: PentaBDE (BDE 99, 47, 100, 153, 154, 85) formulation	NBFR: 2-ethylhexyl-2,3,4,5 tetrabromobenzoate (EH-TBB); bis(2-ethylhexyl)-3,4,5,6 tetrabromophthalate (BEH-TEBP);	
Cequier et al 2014 [38]	Brominated Flame Retardants: PentaBDE (BDE 99, 47, 100, 153, 154, 85) formulation	OPFRs: Chlorinated alkyl organophosphates: tris(2-chloroethyl) phosphate (TCEP), tris(1-chloro-2-propyl) phosphate (TCIPP); tris(1,3-dichloro-2-propyl) phosphate (TDCIPP)	
Cequier et al 2014 [38]	Brominated Flame Retardants	OPFRs: Aryl phosphates, such as triphenyl (TPHP) or tricresyl (TCP) phosphates	FR

Table xx Reported Legacy SVOCs and novel, emerging or identified alternatives.

Author	Legacy	Novel/Emerging	Materials
Cequier et al 2014 [38]	Brominated Flame Retardants	OPFRs nonchlorinated alkyl phosphates: tri-n-butyl phosphate (TNBP)	Plasticizer
De la Torre 2020 [105]	Brominated Flame Retardants	NBFR: TNBP, TCEP, TCIPP, TDCIPP, TPHP, TBOEP and EHDP	
De la Torre 2020 [105]	Brominated Flame Retardants	OPFR: PBEB, HBB, BTBPE and DBDPE	
Fromme et al 2014 [106]	Brominated Flame Retardants	NBFR: TBBPA, BTBPE, EH-TBB, TBPH and DBDPE	
Kademoglou et al 2017 [107]	Brominated Flame Retardants: PentaBDE (BDE 99, 47, 100, 153, 154, 85) formulation	2-ethylhexyl-2,3,4,5 tetrabromobenzoate (EH-TBB); bis(2ethylhexyl)-3,4,5,6-tetrabromophthalate (BEH-TEBP);	
Kademoglou et al 2017 [107]	Brominated Flame Retardants: OctaBDE (BDE-183) formulation	1,2-bis(2,4,6tribromophenoxy) ethane (BTBPE)	
Kademoglou et al 2017 [107]	Brominated Flame Retardants: DecaBDE (BDE-209) formulation	decabromodiphenyl ethane (DBDPE); Dechlorane Plus (DPs)	
Kademoglou et al 2017 [107]	Brominated Flame Retardants	OPFRs: tris(2-chloroethyl) phosphate (TCEP); tris(chloropropyl)phosphate (TCPP)	
Kademoglou et al 2017 [107]	Brominated Flame Retardants	OPFRs: TDCIPP, TCPP and TCEP	flexible polyurethane foams (PUFs) and textiles
Kademoglou et al 2017 [107]	Brominated Flame Retardants	OPFRs: TPHP	plasticiser and a FR in PVC, thermoplastics and synthetic polymers
Kademoglou et al 2017 [107]	Brominated Flame Retardants	OPFRs: TBOEP	plasticiser in floor polish and rubber products

Table xx Reported Legacy SVOCs and novel, emerging or identified alternatives.

Author	Legacy	Novel/Emerging	Materials
Newton et al 2015 [26]	Brominated Flame Retardants: PentaBDE (BDE 99, 47, 100, 153, 154, 85) formulation	Firemaster 550, which is a blend of organophosphorus and brominated flame retardants,7 including EHTBB and BEH-TEBP	
Newton et al 2015 [26]	Brominated Flame Retardants: OctaBDE (BDE-183) formulation	1,2-bis(2,4,6-tribromophenoxy) ethane (BTBPE)	
Newton et al 2015 [26]	Brominated Flame Retardants: DecaBDE (BDE-209) formulation	DBDPE	
Newton et al 2015 [26]	Brominated Flame Retardants	Dechlorane Plus (DP or DDC-CO), HBB, PBT, and DBE-DBCH	
Tao et al 2016 [42]	Brominated Flame Retardants: PBDE and HBCDD	DBDPE; 1,2-bis(2,4,6-tribromophenoxy)ethane (BTBPE); 2ethylhexyl-2,3,4,5-tetrabromobenzoate (EH−TBB); bis(2-ethylhexyl)-tetrabromophthalate (BEH−TEBP); dechlorane plus (DDC−CO); TBBPA−BDBPE; DBE−DBCH	
Christia et al 2019 [22]	Phthalate esters: DMP, DEP, DNBP, DIBP, BBzP, DEHP, DPP dimethyl phthalate (DMP), diethyl phthalate (DEP), di-n-butyl phthalate (DNBP), di-iso-butyl phthalate (DIBP), butyl-benzyl-phthalate (BBzP), bis-2-ethylhexyl phthalate (DEHP)	alternative plasticizers (AP): di-isobutyl adipate (DIBA); acetyl triethyl citrate (ATEC); di-isobutyl sebacate (DBS); tributyl-O-acetyl citrate (ATBC); bis-2-ethylhexyl-adipate (DEHA); diphenyl cresyl phosphate (DPCP); n-butyryl-tri-n-hexyl citrate (BTHC); bis-2-ethylhexyl-terephthalate (DEHT); tri-n-hexyl trimellitate (THTM); tris (2-ethylhexyl) trimellitate (TOTM); di-isononyl ester 1,2-cyclohexane dicarboxylic acid (DINCH); di-isononyl phthalate (DINP); di-isodecyl phthalate (DIDP); bis (2-propylheptyl) phthalate (DPHP).	
Demirtepe et al 2019 [43]	PCBs		
Demirtepe et al 2019 [43]	OCPs: PeCB, HCB, α-HCH, β-HCH, γ-HCH, δ-HCH, o,p'-DDE, p,p'-DDE, o,p'-DDD, p,p'-DDD, o,p'-DDT, p,p'-DDT		
Demirtepe et al 2019 [43]	Brominated Flame Retardants: PBDEs	Novel Halogenated flame retardants: TBP-AE; α-DBE-DBCH; β-DBE-DBCH; TBX; TBP-BAE; α-TBCO; β-TBCO; PBBZ; TBCT; DDC-CO-MA; PBT; PBEB; TBP-DBPE; HBB; PBBA; DBHCTD; EH-TBB; BTBPE; TDBP-TAZTO; s-DDC-CO; a-DDC-CO; BEH-TEBP;	

Table xx Reported Legacy SVOCs and novel, emerging or identified alternatives.

Author	Legacy	Novel/Emerging	Materials
		OPEs (TPrP; TIBP; TNBP; TCEP; TCIPP; DBPP; TPeP; BDPP; TDCIPP; TBOEP; TPHP; EHDPP; TEHP; TOTP; TMTP; TPTP; TIPPP; TDMPP	
Melymuk et al 2016 [108]	PCBs CB-28, 52, 101, 118, 138, 153, 180		may remain in building materials and other indoor applications
Melymuk et al 2016 [109]	OCPs: α-hexachlorocyclohexane (HCH), β-HCH, γ-HCH, δ-HCH, pentachlorobenzene (PeCB), hexachlorobenzene (HCB), o,p'-DDT, p,p'-DDT, o,p'-DDE, p,p'-DDE, o,p'-DDD, and p,p'-DDD		past indoor pesticide application
Melymuk et al 2016 [108]	Brominated Flame Retardants: BDE-28, 47, 66, 85, 99, 100, 153, 154, 183, and 209	2,4,6-tribromophenyl allyl ether (TBP-AE); 2-bromoallyl 2,4,6-tribromophenyl ether (TBP-BAE); 2,3-dibromopropyl 2,4,6-tribromophenyl ether (TBP-DBPE); tetrabromo-p-xylene (TBX); pentabromoethylbenzene (PBEB); pentabromotoluene (PBT); hexabromobenzene (HBB); 2-ethylhexyl 2,3,4,5-tetrabromobenzoate (EH-TBB); bis(2- ethylhexyl)tetrabromophthalate (BEH-TEBP); 1,2-bis(2,4,6-tribromophenoyx) ethane (BTBPE); syn- and anti-Dechlorane Plus (s-DDC-CO, a-DDC-CO); hexachlorocyclopentadienyldibromocyclooctane (DBHCTD), 1,2,5,6-tetra-bromocyclooctane (TBCO); 1,2-dibromo-4-(1,2-dibromoethyl)cyclohexane (DBE-DBCH); ethylhexyl)tetrabromophthalate (BEH-TEBP); 1,2-bis(2,4,6-tribromophenoyx)ethane (BTBPE);	ongoing use in consumer products and building materials