

Table OR4.1 - Process capacity additions, $Q_{j,l,t}$ (ton/year), at each location over a 20-year period in the Base Case.

Process (<i>i</i>)	State (<i>l</i>)	Capacity addition (ton/year)				
		Year <i>t</i> = 1	Year <i>t</i> = 6	Year <i>t</i> = 11	Year <i>t</i> = 13	Year <i>t</i> = 16
Acetone via oxidation of propylene	BA	67573				
Acrylic fibers from acrylonitrile and methyl methacrylate (continuous solution polymerization)	PI		25000			
	SP	25000				
Bisphenol-A via phenol and acetone	PI	22500	22500			
Carbon monoxide from natural gas	BA	81000				
Cumene from benzene and propylene	BA		63500			
	PI					71172
	SC			117620		
Dimethyl terephthalate via TPA	PE	150000	150000	150000		108010
Epoxy resin (liquid) from bisphenol-A and epichlorohydrin (batch process)	AM			9000		
	SC					6819
	SP	9000	9000			
Epoxy resin (solid) from bisphenol-A and epichlorohydrin (batch process)	AM		6351			
	SP	9000				
Ethylbenzene via benzene alkylation	AM		487334			
	RS	522000				
Ethylene via pyrolysis of ethane	PE	227000				
	PI		227000			
Hydrogen cyanide via ammoxidation of methane	BA	32000				
Isobutylene from steam cracked butenes	RS	80000	80000			
	SP			80000		80000
Methanol from methane	PR	318000	310798			
Methyl ethyl ketone from n-butylenes	PE		45000	45000		45000
	SP	45000				
Nylon 6 (chips) from caprolactam	SP	15000	15000			
Phenol via air oxidation of cumene	PI					52720
	SC			91000		
	SP	91000	91000			
Polyacrylate (pellets) by suspension polymerization	BA		7000	7000		
	SC	7000				7000
Polybutylene terephthalate from DMT and 1,4-butanediol	PI					9000
Polycarbonate by continuous solution phosgenation	PI		18000		18000	
	SP	18000				

Process (<i>i</i>)	State (<i>l</i>)	Capacity addition (ton/year)				
		Year $t = 1$	Year $t = 6$	Year $t = 11$	Year $t = 13$	Year $t = 16$
Polyether polyol (glycerine-based triol) from propylene oxide and glycerine	MT		45000	45000		
	PI					32325
	SP	45000				
Polyethylene glycol from ethylene oxide	AM	9000	9000	6609		4500
Polyethylene terephthalate (PET) from TPA and ethylene glycol	SC			22500		22500
	SP	22500	22500			
Polyisobutylenes from isobutylene	SP	10656				
Polystyrene (expandable beads) by suspension polymerization	AM	18000				
	SC				9000	
Polyurethane flexible foam (slab stock) from polyether polyol and toluene diisocyanate	PE	3000				
	PI		3000	3000		3000
Polyvinyl butyral by condensation of polyvinyl alcohol with butyraldehyde	PE	11000				
Polyvinyl chloride (general purpose) by liquid phase bulk process	SC	100000	100000	100000		100000
p-Xylene via isomerization of m-xylene (Parex-Isomar)	BA			91000		
	PE					91000
	SP	91000	91000			
SAN by suspension polymerization	AM	11723				
SBR by cold emulsion polymerization	SC				68000	
Styrene via ethylbenzene (dehydrogenation)	AM	337682				
Vinyl acetate via ethane and acetic acid	PE		136000	68000		
	SC	136000				68000
Vinyl chloride from ethylene	SC	272000		272000		

Table OR4.2 – Total process capacities to be added ($\sum_{i,t} Q_{i,t}$) (ton/year) over 20 years in the Base case, Case I, and Case II

Process (<i>i</i>)	State (<i>l</i>)	Capacity addition (ton/year)		
		Base Case	Case I (-30%)	Case II (+30%)
Acetone via oxidation of propylene	BA	67573		68000
Bisphenol-A via phenol and acetone	AM			39444
	PE		22500	
	PI	45000	22500	
Butadiene via dehydrogenation of n-butane	PE			45000
	PI		45000	
Carbon monoxide from natural gas	BA	81000	81000	81000
Cumene from benzene and propylene	AL		63500	
	BA	63500	63500	127000
	PI	71172		
	SC	117620		117620
Dimethyl terephthalate via TPA	PE	558010	561607	561607
Ethylbenzene via benzene alkylation	AM	487334		
	BA			487334
	PI		500713	
	RS	522000	522000	522000
Ethylene via pyrolysis of ethane	PE	227000	227000	414125
	PI	227000	253769	
Ethylene oxide via oxidation of ethylene (air)	SP		114375	107625
Hydrogen cyanide via ammoxidation of methane	BA	32000		32000
	PE		32000	
Isobutylene from steam cracked butenes	RS	160000	160000	160000
	SP	160000	160000	160000
Methanol from methane	PR	628798	627718	627493
Methyl ethyl ketone from n-butylenes	PE	135000	180000	180000
	SP	45000		
Phenol via air oxidation of cumene	AM			47037
	PI	52720		
	SC	91000		91000
	SP	182000	91000	182000
Phenol via sulfonation of benzene	MA		16000	
	PE		32000	
	RS		16000	

Process (i)	State (I)	Capacity addition (ton/year)		
		Base Case	Case I (-30%)	Case II (+30%)
Styrene via ethylbenzene (dehydrogenation)	AM	337682		337682
	PI		349316	
Terephthalic acid, fiber grade via crude TPA	SP		154800	
Vinyl acetate via ethane and acetic acid	PE	204000	247450	136000
	PI		68000	
	SC	204000	136000	130500
	SP			136000
Vinyl chloride from ethylene	SC	544000	421000	412100
	SP			136000
p-Xylene via isomerization of m-xylene (Parex-Isomar)	BA	91000		182000
	PE	91000	182000	
	SP	182000	182000	182000
Epoxy resin (liquid) from bisphenol-A and epichlorohydrin (batch process)	AM	9000		15819
	MT		15819	
	SC	6819		
	SP	18000	18000	18000
Epoxy resin (solid) from bisphenol-A and epichlorohydrin (batch process)	AM	6351	6351	9000
	SP	9000	9000	7309
Melamine-formaldehyde (molding compound) from melamine and formaldehyde	SC		2000	
	SP		1000	
Nylon 6 (chips) from caprolactam	DF		15000	
	MS		11306	
	SP	30000	15000	30000
Polyacrylate (pellets) by suspension polymerization	BA	14000	14000	7000
	PE		14000	
	SC	14000		7000
	SP			14000
Polyisobutylenes from isobutylene	SP	10656	10656	10656
Polybutylene terephthalate from DMT and 1,4-butanediol	MT			8541
	PE		8541	
	PI	9000	4500	
	SP			4500
Polycarbonate by continuous solution phosgenation	AM			18000
	PE		18000	

Process (i)	State (l)	Capacity addition (ton/year)		
		Base Case	Case I (-30%)	Case II (+30%)
	PI	36000	18000	
	SP	18000	18000	18000
	MT	90000	45000	90000
Polyether polyol (glycerine-based triol) from propylene oxide and glycerine	PB		45000	
	PE		32325	32325
	PI	32325		
	SP	45000	45000	45000
Polyethylene (low density) from an autoclave reactor (backmixed)	AM		50000	
Polyethylene glycol from ethylene oxide	AM	29109	18000	31500
	RJ		9000	
	SC		9000	
Polyethylene terephthalate (PET) from TPA and ethylene glycol	SC	45000	45000	45000
	SP	45000	135000	45000
Polypropylene by solution process	PI		45500	
Polypropylene glycol from propylene oxide	BA		4500	
Polystyrene (expandable beads) by suspension polymerization	AM	18000		18000
	PI		18000	
	SC	9000	9000	9000
Polyurethane flexible foam (slab stock) from polyether polyol and toluene diisocyanate	PE	3000	3000	3000
	PI	9000	9000	6000
	SC			3000
Polyvinyl alcohol from vinyl acetate	PI		22500	
Polyvinyl butyral by condensation of polyvinyl alcohol with butyraldehyde	PE	11000		11000
	PI		11000	
Polyvinyl chloride (general purpose) by liquid phase bulk process	SC	400000	300000	300000
	SP		100000	100000
SAN by suspension polymerization	AM	11723		11723
	MT		7000	
	SC		9018	
Acrylic fibers from acrylonitrile and methyl methacrylate (continuous solution polymerization)	MT		25000	
	PI	25000		25000
	SP	25000	25000	25000
EPDM rubber by suspension polymerization	PI		13500	

Process (<i>i</i>)	State (<i>l</i>)	Capacity addition (ton/year)		
		Base Case	Case I (-30%)	Case II (+30%)
Polybutadiene by lithium-catalyzed polymerization	SC		91000	
SBR by cold emulsion polymerization	PI		68000	
	SC	68000	37935	68000
SBR (latex) by hot emulsion polymerization	PI		11500	
	SC		11500	

Table OR4.3 – Total process capacities to be added ($\sum_{i,t} Q_{j,i,t}$) (ton/year) over 20 years in the Base case and Case III

Process (<i>i</i>)	State (<i>l</i>)	Capacity addition (ton/year)	
		Base Case	Case III
Acetone via oxidation of propylene	BA	67573	
Acrylic fibers from acrylonitrile and methyl methacrylate (continuous solution polymerization)	BA		25000
	PI	25000	
	SP	25000	25000
Bisphenol-A via phenol and acetone	BA		65274
	PI	45000	
Butadiene via dehydrogenation of n-butane	PE		45000
Carbon monoxide from natural gas	BA	81000	81000
Cumene from benzene and propylene	BA	63500	181120
	PI	71172	
	SC	117620	95532
Dimethyl terephthalate via TPA	PE	558010	558010
Epoxy resin (liquid) from bisphenol-A and epichlorohydrin (batch process)	AM	9000	9000
	BA		6819
	SC	6819	
	SP	18000	18000
Epoxy resin (solid) from bisphenol-A and epichlorohydrin (batch process)	AM	6351	9000
	SP	9000	7309
Ethylbenzene via benzene alkylation	AM	487334	
	BA		486955
	RS	522000	522000
Ethylene oxide via oxidation of ethylene (air)	SP		107625
Ethylene via pyrolysis of ethane	PE	227000	227000
	PI	227000	227000
Hydrogen cyanide via ammoxidation of methane	BA	32000	32000
Isobutylene from steam cracked butenes	RS	160000	160000
	SP	160000	160000
Methanol from methane	PR	628798	628798
Methyl ethyl ketone from n-butylenes	PE	135000	135000
	SP	45000	45000
Nylon 6 (chips) from caprolactam	BA		30000
	SP	30000	
Phenol via air oxidation of cumene	BA		91000
	PI	52720	
	SC	91000	70764
	SP	182000	182000
Polyacrylate (pellets) by suspension polymerization	BA	14000	28000
	SC	14000	
Polybutylene terephthalate from DMT and 1,4-butanediol	BA		9000
	PI	9000	
Polycarbonate by continuous solution phosgenation	BA		36000
	PI	36000	
	SP	18000	18000
	BA		135000

Process (i)	State (I)	Capacity addition (ton/year)	
		Base Case	Case III
Polyether polyol (glycerine-based triol) from propylene oxide and glycerine	MT	90000	
	PI	32325	32325
	SP	45000	
Polyethylene glycol from ethylene oxide	AM	29109	31500
Polyethylene terephthalate (PET) from TPA and ethylene glycol	SC	45000	
	SP	45000	90000
Polyisobutylenes from isobutylene	SP	10656	10656
Polystyrene (expandable beads) by suspension polymerization	AM	18000	18000
	SC	9000	
Polyurethane flexible foam (slab stock) from polyether polyol and toluene diisocyanate	BA		12000
	PE	3000	
	PI	9000	
Polyvinyl butyral by condensation of polyvinyl alcohol with butyraldehyde	PE	11000	11000
Polyvinyl chloride (general purpose) by liquid phase bulk process	SC	400000	300000
	SP		100000
p-Xylene via isomerization of m-xylene (Parex-Isomar)	BA	91000	182000
	PE	91000	
	SP	182000	182000
SAN by suspension polymerization	AM	11723	
SBR by cold emulsion polymerization	SC	68000	68000
	SP		37935
Styrene via ethylbenzene (dehydrogenation)	AM	337682	337352
Vinyl acetate via ethane and acetic acid	PE	204000	204000
	SC	204000	68000
	SP		136000
Vinyl chloride from ethylene	BA		272000
	SC	544000	
	SP		136000