

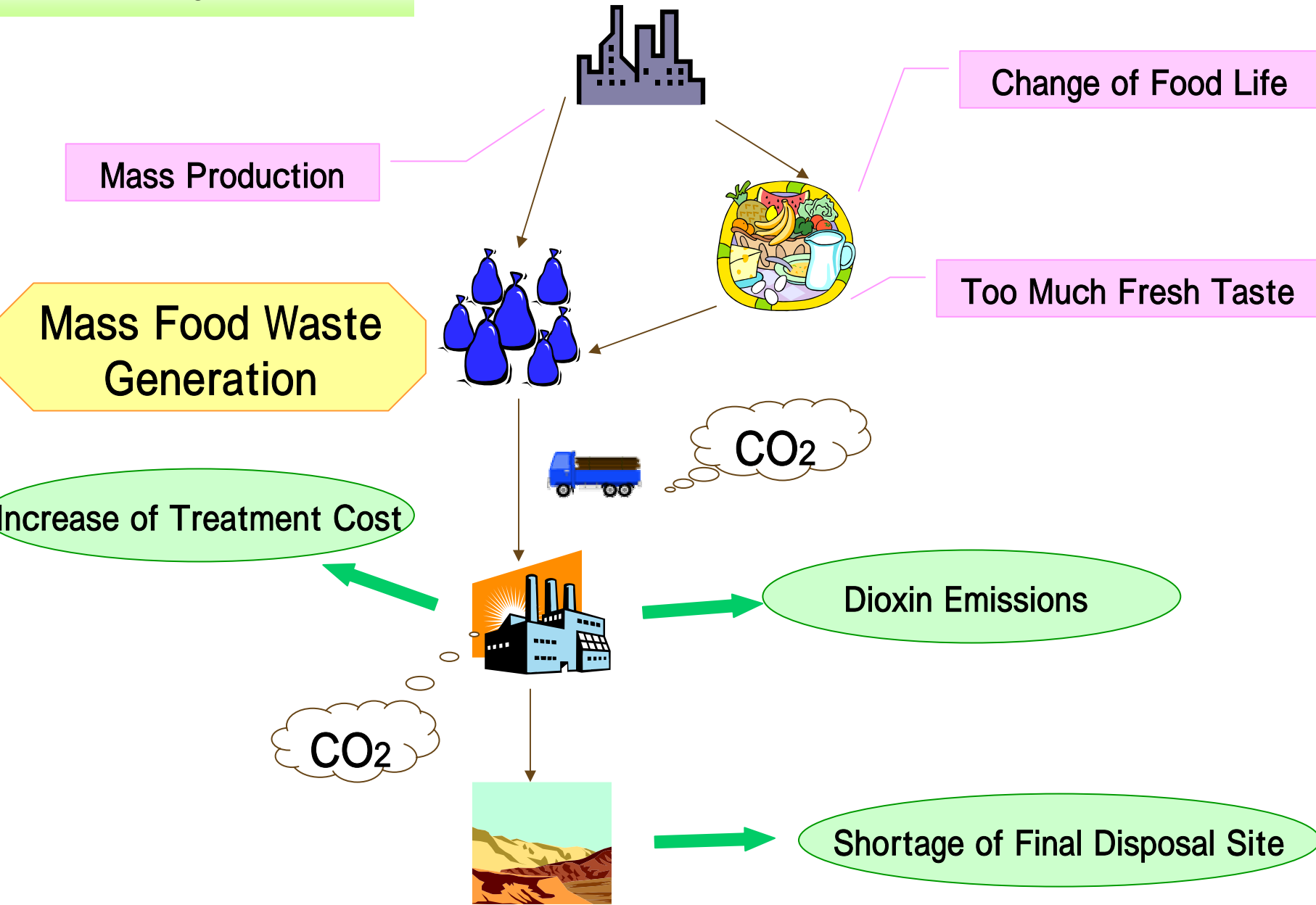
Macro Economic Impact of Food Waste Recycling in Japan

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Background



Present condition

Table 1. Food waste treatment (1996)

type of waste	emission	treatment				
		incenera- tion	recycling			total
			compost- ing	feeding	others	
Municipal waste	16.00	15.95	0.005	-	-	0.005
business sectors	6.00	(99.7%)	(0.3%)	-	-	(0.3%)
household	10.00					
Industrial waste	3.40	1.77	0.47	1.04	0.12	1.63
		(52%)	(14%)	(31%)	(3%)	(48%)
business sector and industry total	9.40	7.75	0.49	1.04	0.12	1.65
		(83%)	(5%)	(11%)	(1%)	(17%)
Total	1.94	17.72	0.42	1.04	0.12	1.68
		(91%)	(3%)	(5%)	(1%)	(9%)

unit: Million t

0.5%(1999)

65%(1999)

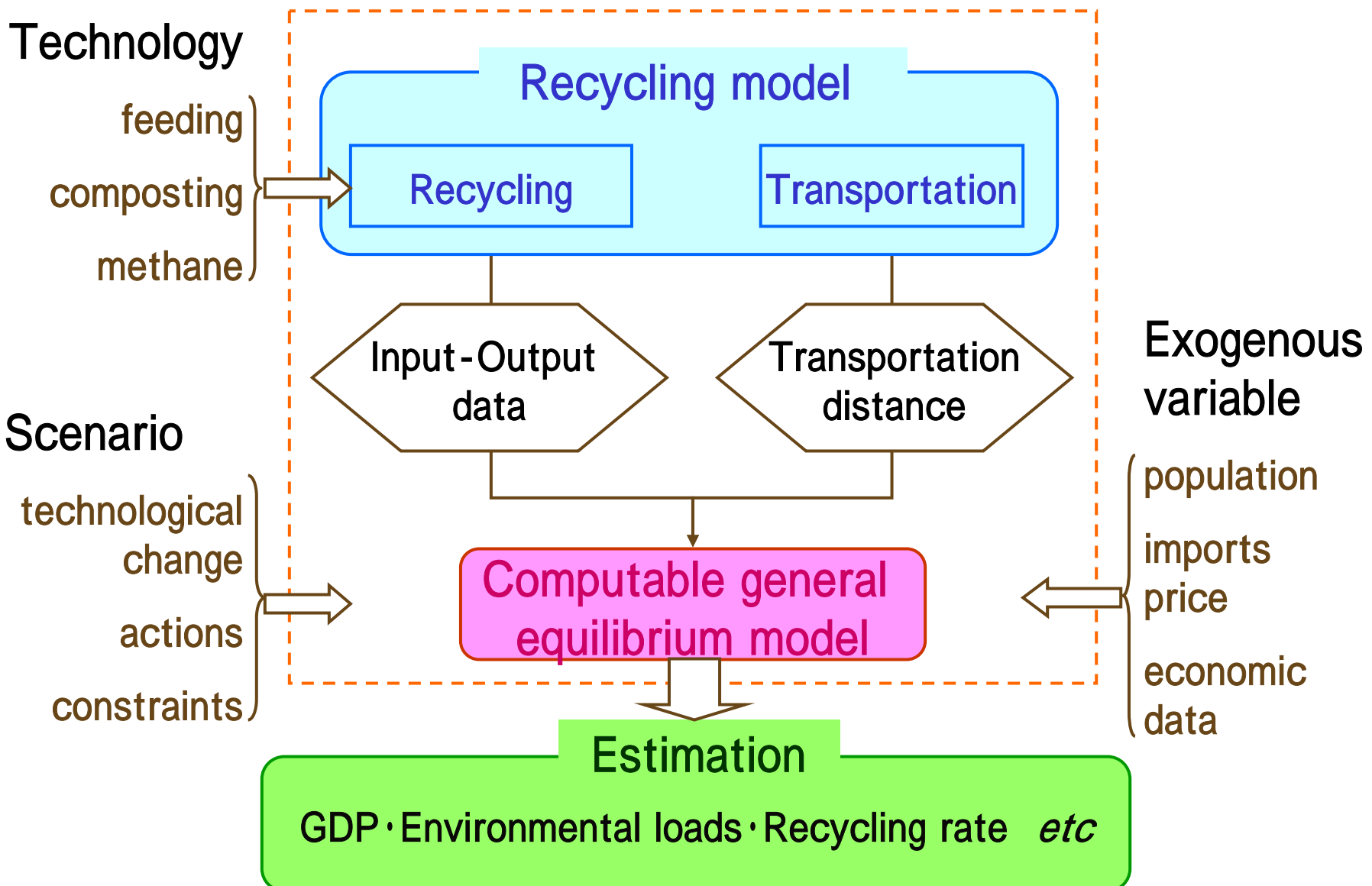
Research objective

When considering environmental problems, economic growth should not be ignored. It is generally thought that environmental conservation and economic development are in conflict.

Objective

To evaluate both the economic loss and effects of food waste recycling systems derived from the environmental constraints and the recycling promotion policies.

Frame

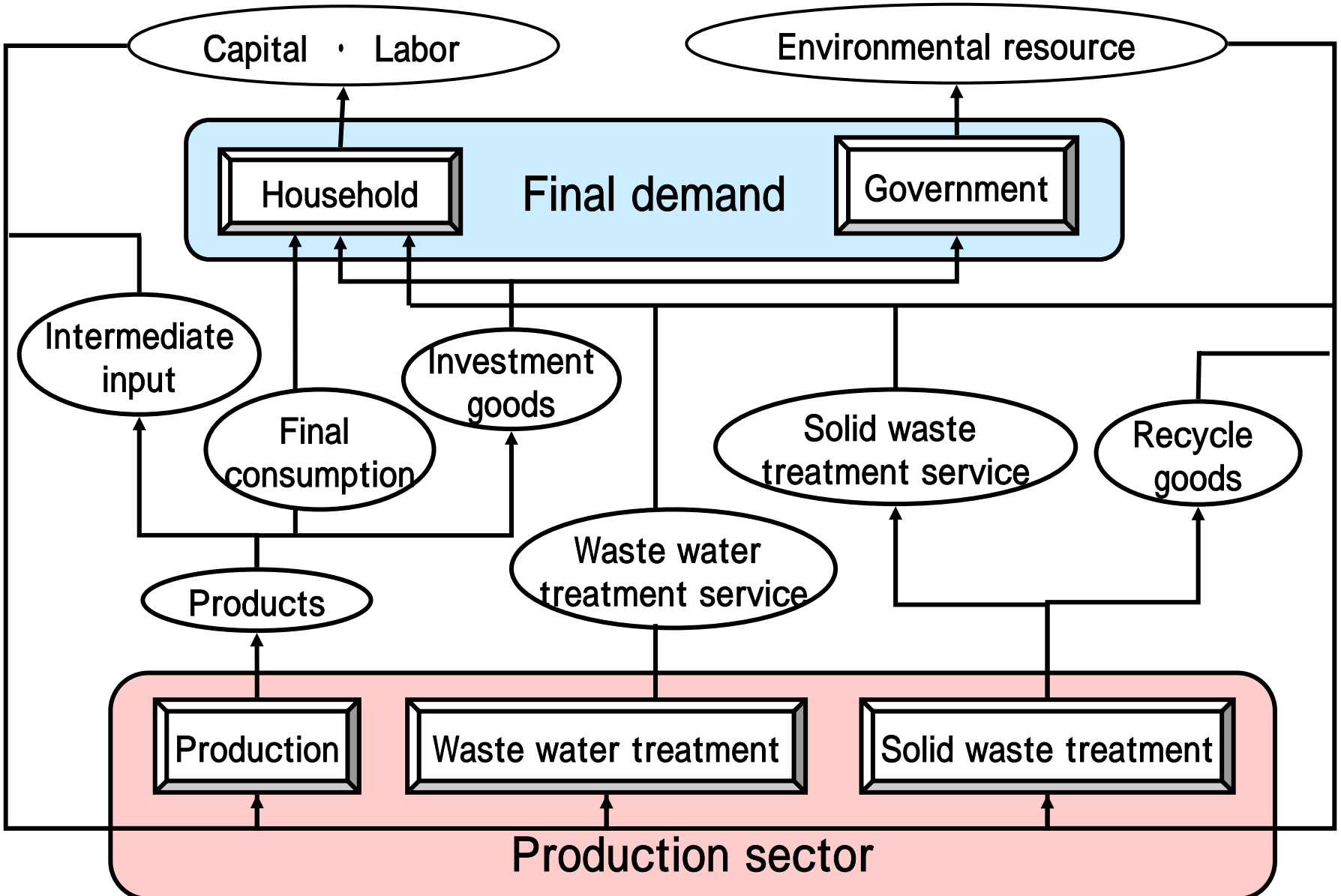


Model description

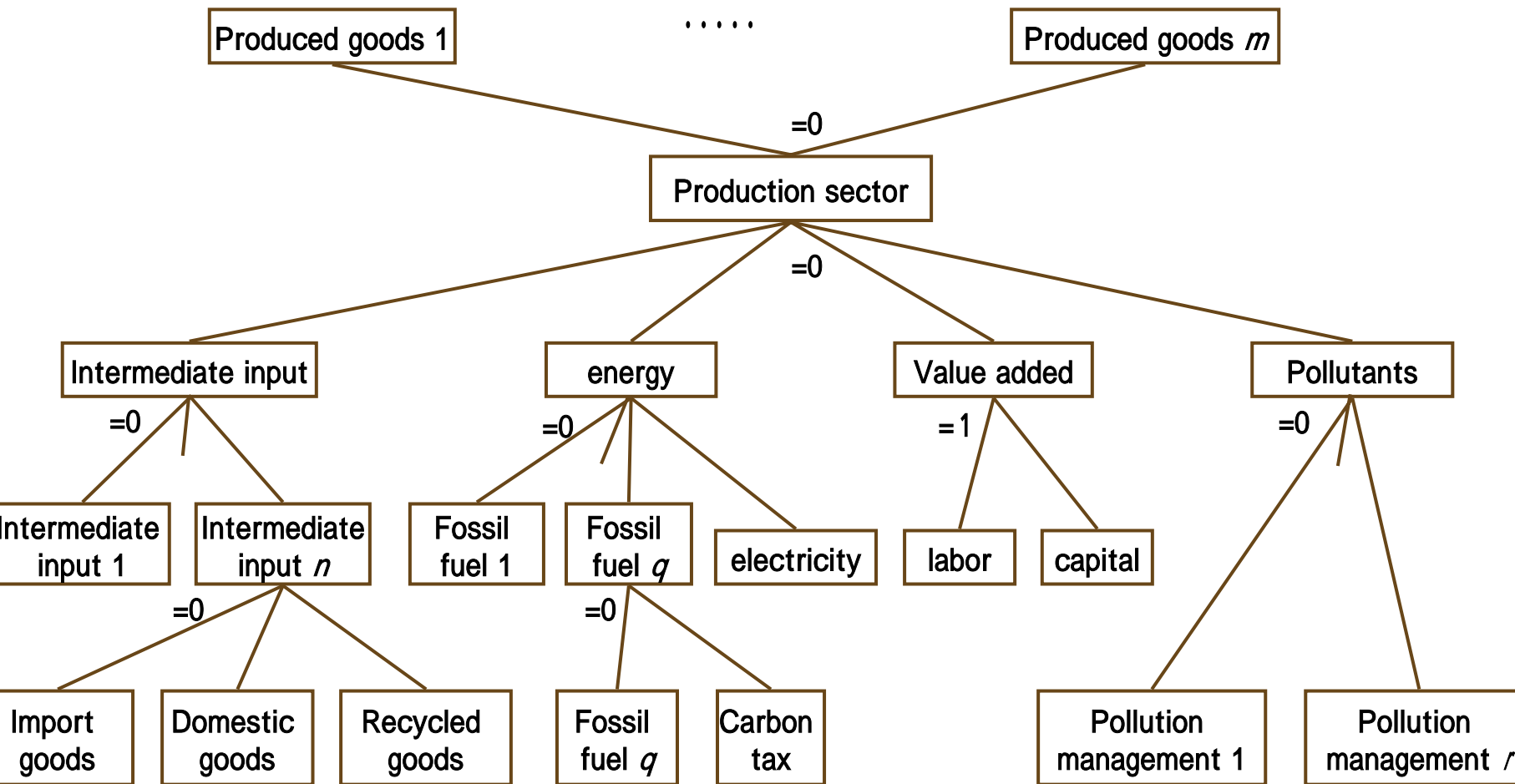
Model	AIM/Material
	(computable general equilibrium model)
sector	45 economic sectors
good	49 goods · services
waste	18 industrial waste 7 municipal waste
simulation	1995-2010

Structure of Model

▭ sector ○ goods/service

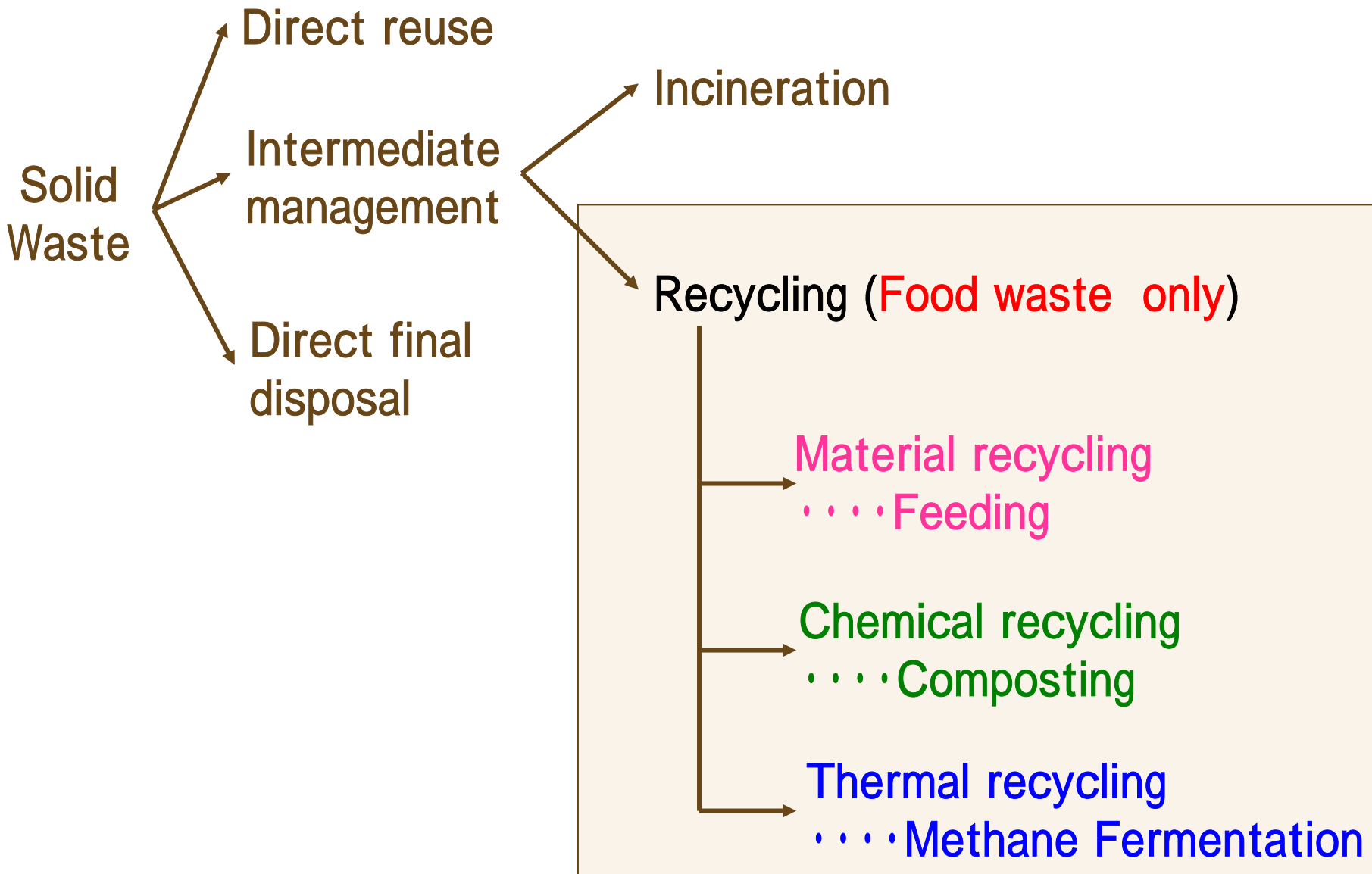


Structure of production sectors



: elasticity of substitution/distribution

Solid Waste Flow



Scenario

Table 2. Scenario sets

Scenario No	BaU	Const	E23	E12	Const /E23	Const /E12
Introduction of recycling sectors						
enviromental constraints						
E1	charges to the use of virgin goods					
E2	subsidies to the recycling sectors					
E3	raising the incineration treatment price					

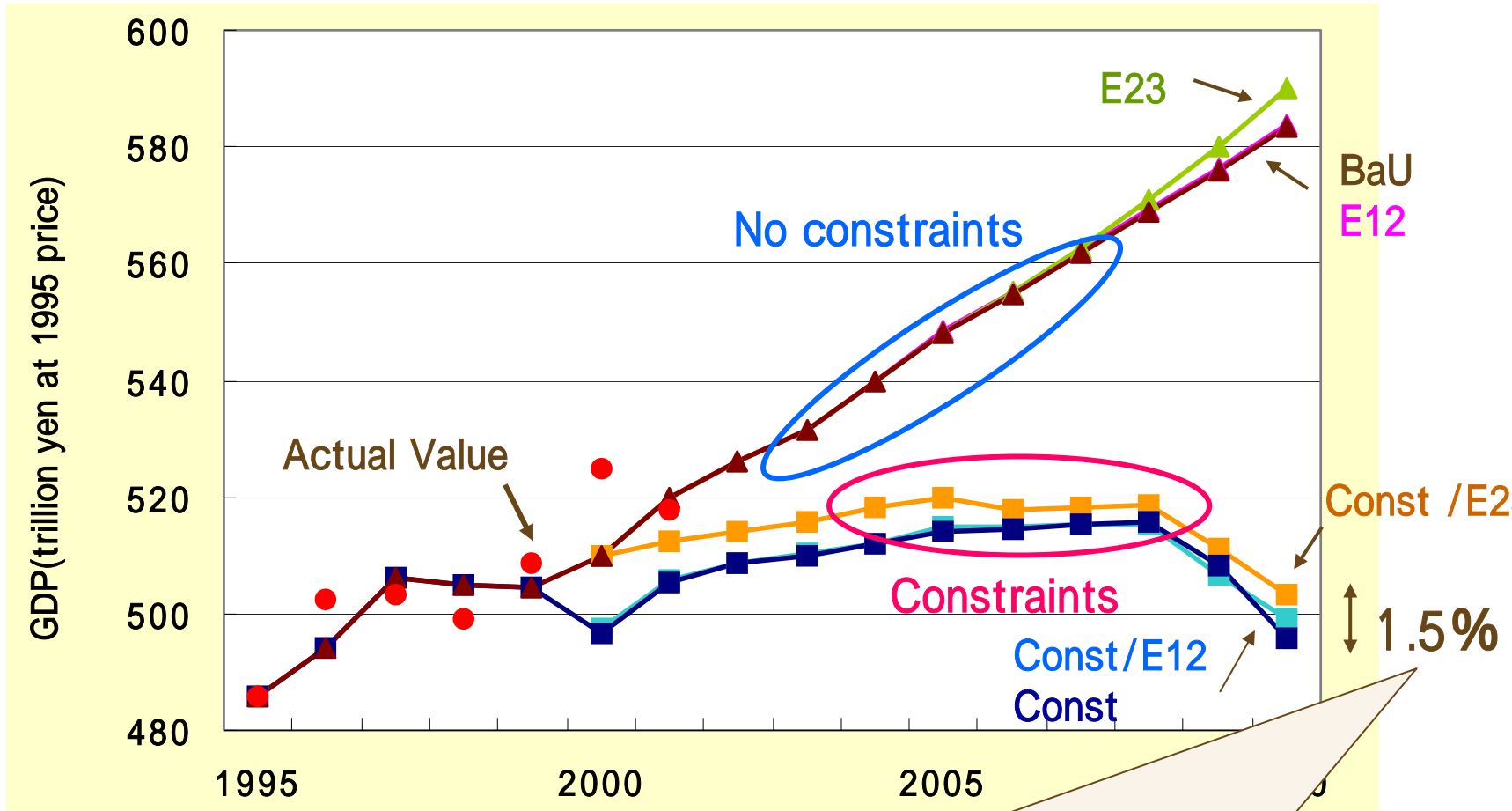
Environmental constraints

{ CO2 emission
 { Final disposal

6% reduction by 2010 compared with that in 1990

half reduction by 2010 compared

GDP



The promotion of food waste recycling contributes to stimulate economic activities.

Environmental loads

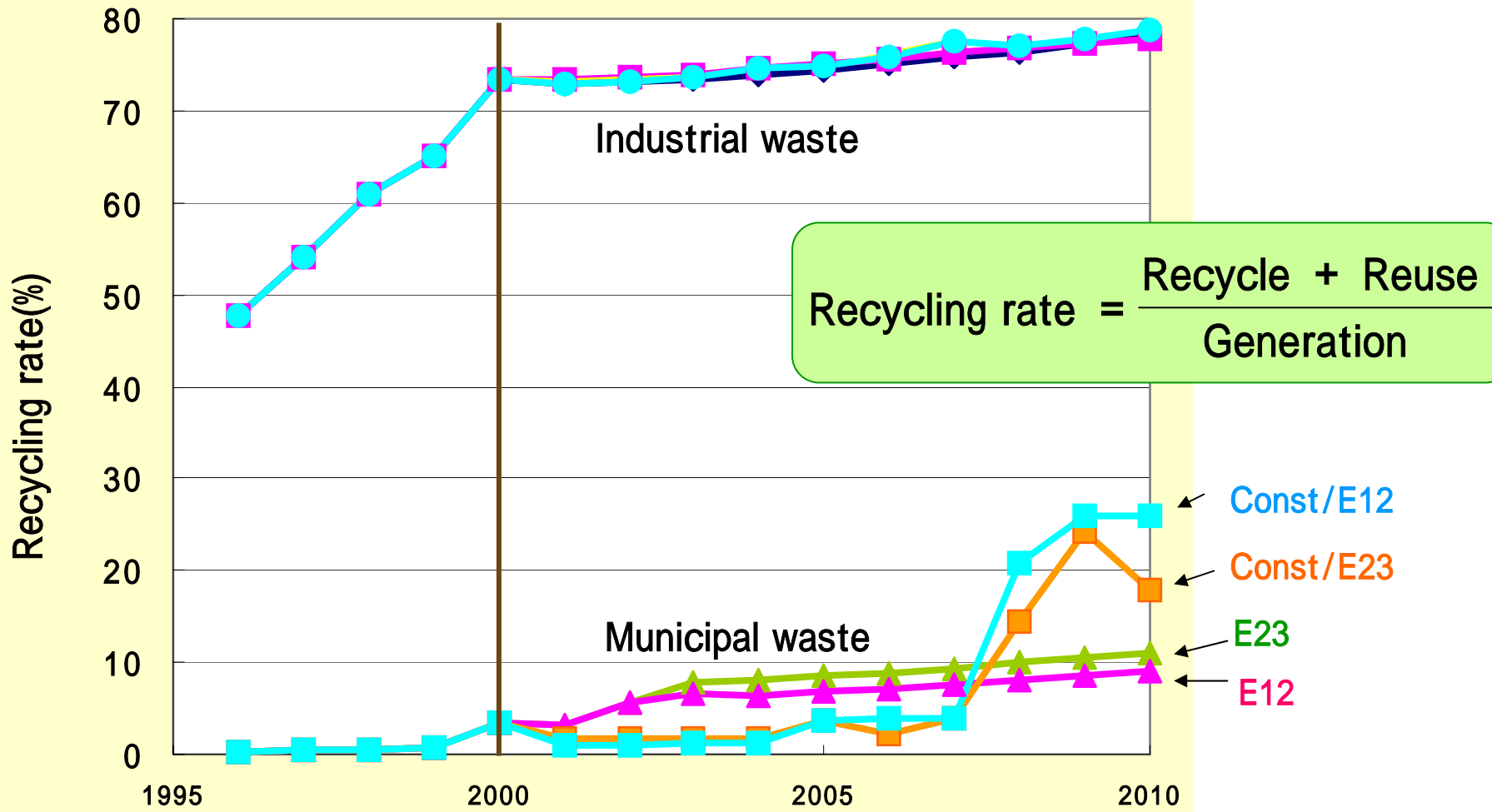
Table 3. Increases of Environmental loads from 1995 to 2010

Scenario	BaU	E23	E12	Const	Const /E23	Const /E12
CO ₂ emission	12.9	15.2	12.9	-42.5	-42.5	-42.5
Industrial final disposal	-8.7	-11.6	-0.9	-38.0	-38.0	-38.0
Municipal final disposal	-5.3	-5.3	-5.3	-7.1	-7.1	-7.1

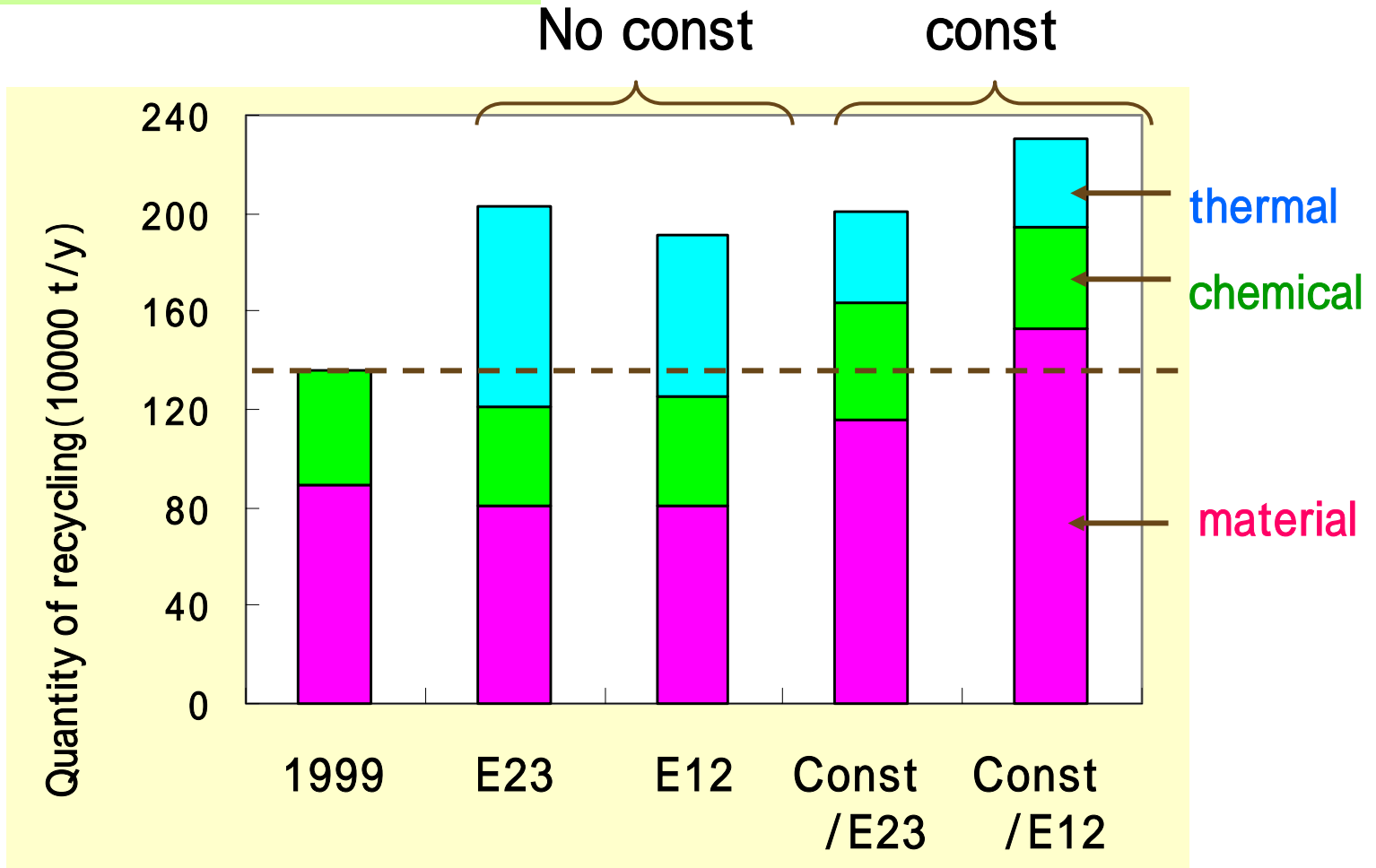
Unit: CO₂emission: Million t-C, final disposal: Million t

In no environmental constraint scenarios, to promote food waste recycling is not always effective to reduce environmental loads.

Recycling rate of food waste



Technology share (2010)



No constraints ··· thermal recycling

Constraints ··· material recycling

Conclusion

1. In environmental constraint scenarios, promotion of food waste recycling **contributes to mitigate economic depression.**
2. In no environmental constraint scenarios, to promote food waste recycling increases **the CO₂ emission.**
3. In no environmental constraint scenarios **the thermal treatment** increases and in environmental constraint scenarios **the material treatment** increases.