

# Introduction of New SDB

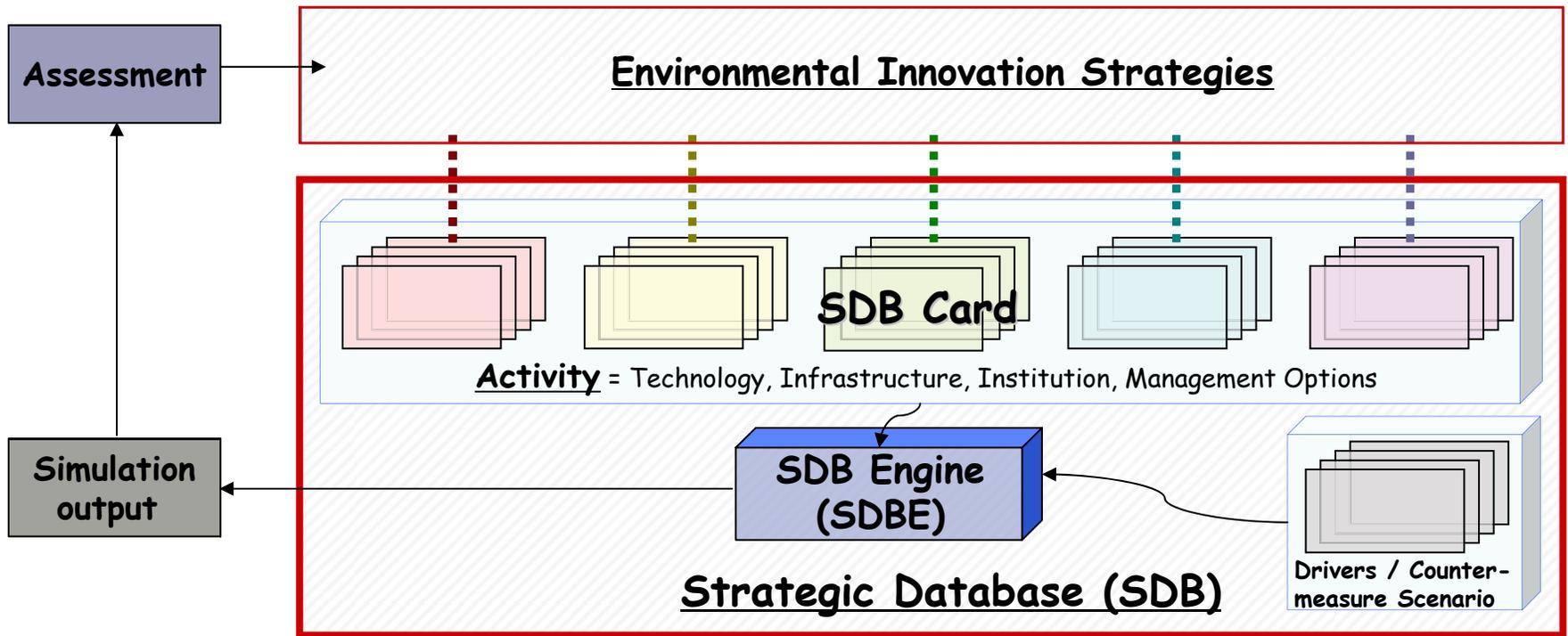
Go Hibino of MHIR

2006.2.20

The 11th AIM International Workshop

# 1. What is SDB ?

SDB = Strategic DataBase



Structure of SDB and application of SDB

## 2. Update of SDB

SDB = Strategic DataBase

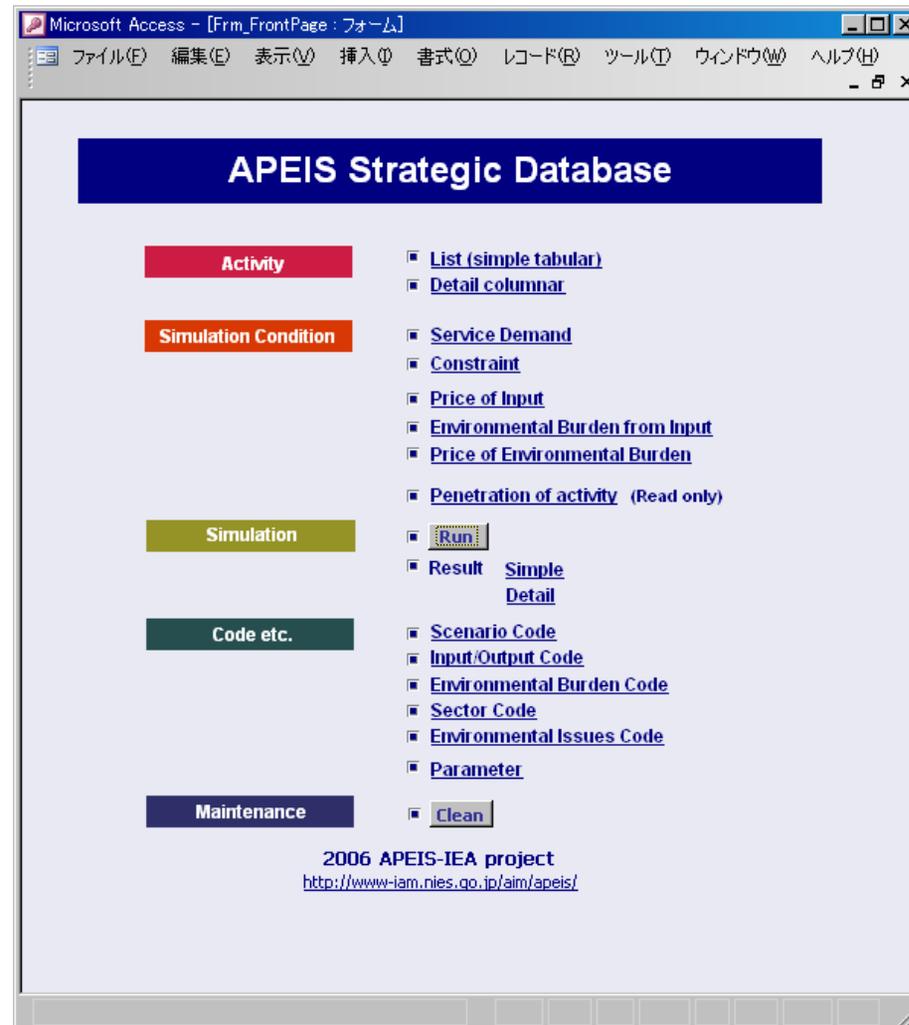
### 1) Modify form design.

- Users browse data in a longitudinal direction without scroll bar 

- SDB provides warehouse of material for data developers. 

### 2) Develop a module estimating future environmental burden. (=SDBE)

# Start form of SDB



# Activity : Passenger vehicle with electric motor

Microsoft Access - [Activity : フォーム]

ファイル(F) 編集(E) 表示(V) 挿入(I) 書式(O) レコード(R) ツール(T) ウィンドウ(W) ヘルプ(H) 質問を入力してください

## Activity

Activity	6106 TR_PV_EL1	Sector	[TR]:Transportation sector
	PS. Vehicle / Electric	ENV. Issue	[CC]:Climate Change
Activity type	<input checked="" type="radio"/> To satisfy service demand <input type="radio"/> To influence flow <input type="radio"/> To influence other activity	Activity Unit	Name Unit Value 1
Description	In electric cars, an electric motor and control unit form the power unit, and the electric motor runs on electricity stored in a battery. Recently, third generation electric cars equipped with nickel metal hydride batteries or lithium-ion batteries have appeared, and their performance has improved nearly to the level of conventional cars.	Contact Prs.	GH of MHIR
		Figure	Memo
			
		(NIES)	1

Lifetime
  Fixed Cost
  O+M Cost
  Input
  Output
  Affected Activity
  Affected Flow
  Burden
  Penetration
  Reference

	2000	2010	2020	2030	2040	2050	Note
	9.96						*4

Note: Only one record is valid. Do not enter multiple records for an activity.

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# Activity : Passenger vehicle with internal combustion

Microsoft Access - [Activity : フォーム]

ファイル(F) 編集(E) 表示(V) 挿入(I) 書式(O) レコード(R) ツール(T) ウィンドウ(W) ヘルプ(H) 質問を入力してください

## Activity

Activity	6101   TR_PV_G01	Sector	[TR]:Transportation sector
	PS. Vehicle / IC / Oil	ENV. Issue	[CC]:Climate Change
Activity type	<input checked="" type="radio"/> To satisfy service demand <input type="radio"/> To influence flow <input type="radio"/> To influence other activity	Activity Unit	Name Unit Value 1
Description	Passenger oil vehicle with internal combustion.	Contact Prs.	GH of MHIR

Figure Memo

a) Stock number of passenger vehicle (1000 units, 2000)  
 = 10,084(Light)+28,202(Small)+14,163(Ordinary) (\*1)  
 = 52,499

b) Fuel consumption of passenger vehicle (1000kj, 2000) (\*2)  
 - Gasoline = 50,149(Private)+97(Commercial)=50,246  
 - Diesel = 6,434(Private)+52(Commercial)=6,486  
 - LPG = 2,750

c) Calorific value (kgoe/l) (\*3)  
 - Gasoline = 0.8226  
 - Diesel = 0.9126  
 - LPG = 28.1MJ/kj = 0.6722

d) Fuel consumption of passenger vehicle (ktoe)

Lifetime Fixed Cost O+M Cost Input Output Affected Activity Affected Flow Burden Penetration Reference

Input	2000	2010	2020	2030	2040	2050	Note
[OLG]: Gasoline (kgoe)	935.2	748.2	710.8	673.4	636	598.6	e), h), i)

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# Reference of estimation

Microsoft Access - [Activity : フォーム]

Adobe Acrobat Standard - [交通経済統計要覧2003.pdf - リンクされたファイル]

Activity: テキスト選択ツール

57%

使い方...?

地球政策研究機構 (財) 運輸政策研究機構発行  
Issued by Institution for Transport Policy Studies

114 施設 自動車保有  
Number of Motor Vehicles Owned

区分	Section	4/1/97	5/1/97	5/1/98	4/1/99
合計	Sum Total	18 919 020	29 143 445	38 992 025	48 240 335
計	Total	12 779 069	23 018 060	31 249 920	35 226 180
普通車	計 Total	893 865	1 175 453	1 502 408	1 673 148
乗用車	計 Total	585 216	822 443	1 051 653	1 170 989
乗用車	計 Total	258 627	335 010	430 755	530 039
乗用車	計 Total	4 511 700	6 124 658	7 109 706	8 563 119
乗用車	計 Total	4 428 042	6 041 186	7 023 713	8 469 512
乗用車	計 Total	82 857	83 472	85 993	93 607
乗用車	計 Total	111 080	40 816	13 551	3 883
乗用車	計 Total	101 655	36 241	12 922	3 667
乗用車	計 Total	9 425	2 575	629	216
乗用車	計 Total	23 748	45 097	57 313	65 848
乗用車	計 Total	9 141	9 707	8 564	6 156
乗用車	計 Total	14 627	35 390	48 749	59 712
乗用車	計 Total	103 742	106 104	104 655	109 080
乗用車	計 Total	28 024	21 300	21 736	24 400
乗用車	計 Total	83 228	84 804	84 919	84 680
乗用車	計 Total	84 304	113 841	122 974	121 703
乗用車	計 Total	84 614	111 858	119 225	116 263
乗用車	計 Total	1 690	1 983	3 549	5 440
乗用車	計 Total	74 739	215 170	429 843	714 714
乗用車	計 Total	73 097	212 864	428 204	712 294
乗用車	計 Total	2 882	2 306	1 639	2 322
乗用車	計 Total	6 780 190	14 056 923	21 063 657	25 132 802
乗用車	計 Total	4 485 296	14 365 861	20 614 702	24 882 543
乗用車	計 Total	214 892	241 042	248 955	250 219
乗用車	計 Total	152 496	287 824	385 192	468 836
乗用車	計 Total	121 643	231 409	309 933	373 113
乗用車	計 Total	30 855	56 335	75 239	95 723
乗用車	計 Total	72 325	96 805	117 428	123 721
乗用車	計 Total	64 908	92 992	115 411	120 227
乗用車	計 Total	5 617	3 893	4 027	4 544
乗用車	計 Total	121 638	211 039	289 395	341 194
乗用車	計 Total	6 139 951	6 124 505	7 742 091	12 127 375
乗用車	計 Total	171 533	257 208	444 975	850 615
乗用車	計 Total	5 968 418	5 867 297	7 297 116	12 061 760
乗用車	計 Total	5 298 271	5 385 126	6 791 513	10 689 060
乗用車	計 Total	2 327 644	2 555 456	2 102 619	1 945 616
乗用車	計 Total	2 919 427	2 829 646	4 618 994	8 944 444
乗用車	計 Total	528 827	482 229	574 291	1 175 467

115 施設 車両数  
Vehicles Owned

年	201990	211995	911997	101998	111999	122000	132001	142002
合計	42 230 451	47 727 850	51 727 297	52 121 422	52 264 404	52 441 216	52 423 222	52 274 189
普通車	2 304 081	2 584 134	2 655 607	2 626 175	2 594 535	2 580 392	2 584 158	2 517 510
乗用車	1 474 161	1 734 729	1 763 933	1 739 844	1 724 931	1 680 486	1 656 668	1 621 103
乗用車	731 290	849 427	891 734	886 331	889 604	901 104	897 530	897 407
乗用車	6 537 630	6 151 177	5 907 754	5 719 268	5 539 100	5 389 436	5 216 390	5 014 046
乗用車	6 444 029	6 065 316	5 826 249	5 637 900	5 459 328	5 310 039	5 138 306	4 939 466
乗用車	93 601	85 861	85 505	81 368	79 772	79 397	78 084	76 582
乗用車	2 355	1 448	1 344	1 293	1 253	1 214	1 175	1 146
乗用車	1 929	1 336	1 232	1 182	1 142	1 117	1 074	1 050
乗用車	136	112	112	111	111	99	99	98
乗用車	88 765	121 049	128 444	129 559	131 246	134 042	135 112	136 216
乗用車	4 491	9 177	9 400	9 629	9 474	9 306	9 234	8 986
乗用車	82 274	111 872	119 014	119 930	121 772	124 736	125 878	127 220
乗用車	135 103	114 396	112 540	111 184	110 270	110 226	110 226	110 208
乗用車	28 137	29 160	28 667	28 214	27 929	27 438	26 757	26 210
乗用車	86 966	85 236	83 873	82 970	82 341	82 807	83 469	82 998
乗用車	126 741	128 511	127 526	125 962	125 455	125 264	124 018	122 972
乗用車	122 877	118 529	115 518	112 998	111 446	109 544	104 953	102 169
乗用車	7 864	9 982	11 008	12 964	14 009	15 721	17 065	17 803
乗用車	1 933 533	8 383 410	11 385 626	12 324 936	13 233 731	14 163 357	14 938 584	15 433 640
乗用車	1 926 168	8 283 402	11 229 648	12 229 442	13 204 291	14 132 311	14 905 895	15 398 886
乗用車	7 364	20 008	25 978	27 494	29 640	31 046	32 691	34 854
乗用車	30 502 964	30 799 296	29 977 367	29 455 940	28 621 974	28 201 712	27 589 146	27 221 229
乗用車	30 250 729	30 563 522	29 744 870	29 225 654	28 594 326	27 976 415	27 362 804	26 992 741
乗用車	252 225	235 974	232 497	230 285	227 648	225 297	224 342	224 478
乗用車	630 742	658 482	682 268	697 813	718 212	734 403	751 057	769 176
乗用車	494 476	680 712	815 033	893 508	956 470	992 452	991 997	963 932
乗用車	134 266	177 770	197 235	204 305	212 742	222 151	229 060	235 244
乗用車	148 000	174 420	194 095	208 672	216 824	216 528	208 783	196 815
乗用車	152 982	144 583	183 119	197 261	204 992	204 147	195 226	184 188
乗用車	7 038	9 847	10 976	11 411	11 832	12 432	12 557	12 647
乗用車	422 807	491 493	514 966	518 627	528 804	523 149	524 533	524 147
乗用車	17 758 299	20 378 484	21 119 184	21 564 960	22 218 208	22 663 757	23 847 891	24 618 328
乗用車	999 854	1 099 013	1 243 577	1 289 252	1 268 399	1 288 417	1 234 354	1 252 199
乗用車	16 768 545	19 149 473	19 875 969	20 297 728	21 029 809	21 755 349	22 513 237	23 266 129
乗用車	15 025 742	17 341 490	18 108 877	18 568 959	19 329 964	20 041 396	20 777 523	21 492 291
乗用車	2 713 534	3 945 822	7 401 213	8 185 273	9 344 424	10 094 285	10 959 561	11 816 447
乗用車	12 310 428	11 375 848	10 707 644	10 383 719	10 157 522	9 957 111	9 817 964	9 675 844
乗用車	1 741 548	1 826 630	1 765 470	1 727 450	1 704 522	1 712 597	1 734 393	1 772 545

291 x 209.9 ミリ

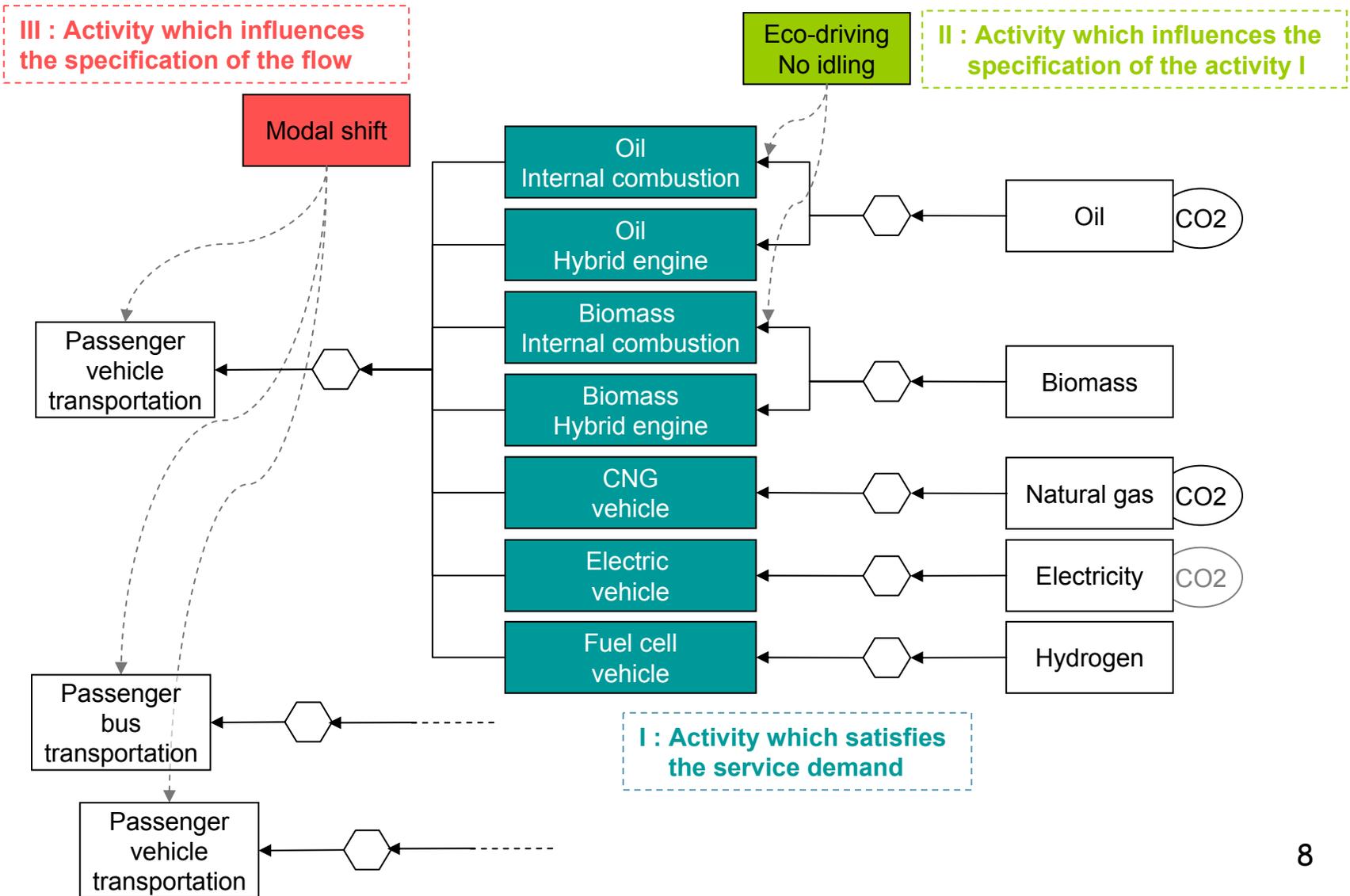
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# 3. Application to transportation sector



# Activity : Passenger vehicle with internal combustion

Microsoft Access - [Activity : フォーム]

ファイル(F) 編集(E) 表示(V) 挿入(I) 書式(O) レコード(R) ツール(T) ウィンドウ(W) ヘルプ(H) 質問を入力してください

## Activity

Activity	6101 TR_PV_G01	Sector	[TR]:Transportation sector					
	PS. Vehicle / IC / Oil	ENV. Issue	[CC]:Climate Change					
Activity type	<input checked="" type="radio"/> To satisfy service demand <input type="radio"/> To influence flow <input type="radio"/> To influence other activity							
Description	Passenger oil vehicle with internal combustion.							
	Figure Memo  Allion by Toyota 1							
Lifetime Fixed Cost O+M Cost Input Output Affected Activity Affected Flow Burden Penetration Reference								
Unit:Share of the output to the total demand								
No	Scenario	2000	2010	2020	2030	2040	2050	Note
▶ 601	RF	100%	100%	100%	100%	100%	100%	
1601	CM-1	100%	80%	60%	40%	20%	0%	
2601	CM-2	100%	80%	60%	40%	20%	0%	
*								

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# Activity : Passenger vehicle with fuel cell

Microsoft Access - [Activity : フォーム]

ファイル(F) 編集(E) 表示(V) 挿入(I) 書式(O) レコード(R) ツール(T) ウィンドウ(W) ヘルプ(H) 質問を入力してください

## Activity

Activity	6107 TR_PV_FC1	Sector	[TR]:Transportation sector
	PS. Vehicle / Fuel cell	ENV. Issue	[CC]:Climate Change
Activity type	<input checked="" type="radio"/> To satisfy service demand <input type="radio"/> To influence flow <input type="radio"/> To influence other activity	Activity Unit	Name Unit Value 1
Description	Passenger fuel cell vehicle.	Contact Prs.	GH of MHIR

Figure Memo



Fuel cell vehicle (kantei) 1

Lifetime
  Fixed Cost
  O+M Cost
  Input
  Output
  Affected Activity
  Affected Flow
  Burden
  Penetration
  Reference

Unit = JPY

	2000	2010	2020	2030	2040	2050	Note
	10,000,000	10,000,000	5,000,000	3,000,000	2,000,000	1,500,000	

Note: Only one record is valid. Do not enter multiple records for an activity

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# Activity : Passenger bio-fuel vehicle with hybrid engine

Microsoft Access - [Activity : フォーム]

ファイル(E) 編集(E) 表示(V) 挿入(I) 書式(O) レコード(R) ツール(T) ウィンドウ(W) ヘルプ(H) 質問を入力してください

## Activity

Activity	6104 TR_PV_BH1	Sector	[TR]:Transportation sector
	PS. Vehicle / Hybrid / Biomass	ENV. Issue	[CC]:Climate Change
Activity type	<input checked="" type="radio"/> To satisfy service demand <input type="radio"/> To influence flow <input type="radio"/> To influence other activity	Activity Unit	Name Unit Value 1
Description	Passenger bio-alcohol vehicle with hybrid engine.	Contact Prs.	GH of MHIR

Figure Memo



Lifetime Fixed Cost O+M Cost Input Output Affected Activity Affected Flow Burden Penetration Reference

No	Scenario	2000	2010	2020	2030	2040	2050	Note
604	RF	0%	0%	0%	0%	0%	0%	
1604	CM-1	0%	0%	0%	0%	0%	0%	
▶ 2604	CM-2	0%	0%	10%	40%	80%	100%	
*								

Unit: Share of the output to the total demand

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# Activity : Modal shift to public transportation system

Microsoft Access - [Activity : フォーム]

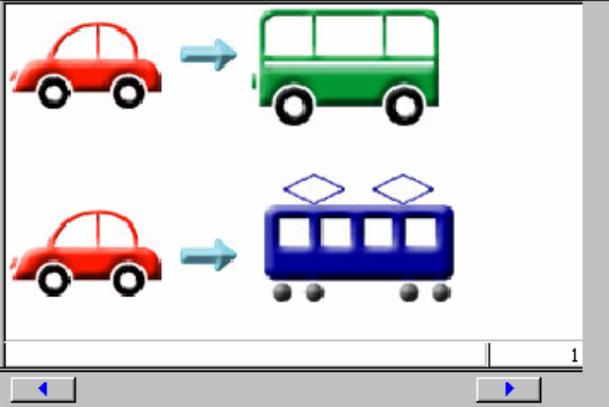
ファイル(F) 編集(E) 表示(V) 挿入(I) 書式(O) レコード(R) ツール(T) ウィンドウ(W) ヘルプ(H) 質問を入力してください

## Activity

Activity: 6401 MDL\_SHT  
 Modal shift  
 Activity type:  To satisfy service demand  To influence flow  To influence other activity  
 Description:

Sector: [TR]:Transportation sector  
 ENV. Issue: [CC]:Climate Change  
 Activity Unit: Name Value  
 Contact Prs: GH of MHIR

Figure Memo



Lifetime Fixed Cost O+M Cost Input Output Affected Activity Affected Flow Burden Penetration Reference

Unit: Stock number in the above base unit

No	Scenario	2000	2010	2020	2030	2040	2050	Note
▶ 1	RF	0	0	0	0	0	0	
2	CM-1	0	0	0	0	0	0	
3	CM-2	0	2,000	4,000	6,000	8,000	10,000	
*								

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# Activity : No Idling

Microsoft Access - [Activity : フォーム]

ファイル(F) 編集(E) 表示(V) 挿入(I) 書式(O) レコード(R) ツール(T) ウィンドウ(W) ヘルプ(H) 質問を入力してください

## Activity

Activity	6301   TR_ED_NIDL	Sector	[TR]:Transportation sector
	Eco-driving: No idling	ENV. Issue	[CC]:Climate Change
Activity type	<input type="radio"/> To satisfy service demand <input type="radio"/> To influence flow <input checked="" type="radio"/> To influence other activity	Activity Unit	Name Unit Value 1
		Contact Prs.	GH of MHIR
Description	Turning off the engine to prevent wasted energy when stopping to wait for passengers, or to unload luggage. Ten minutes of idling in a passenger car uses 130 cc of gasoline, while 1 hour of idling in a large diesel vehicle uses a maximum of 1,800 cc of fuel. In general, stopping idling when stopped for 5 seconds or more is thought to be effective.		
	Figure Memo  Image of "No idling" 1		

Lifetime  Fixed Cost  O+M Cost  Input  Output  Affected Activity  Affected Flow  Burden  Penetration  Reference

Unit: Introduction ratio to the corresponding activity

No	Scenario	2000	2010	2020	2030	2040	2050	Note
1	RF	0%	0%	0%	0%	0%	0%	
2	CM-1	0%	0%	0%	0%	0%	0%	
3	CM-2	0%	10%	30%	50%	70%	100%	
*								

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# Service demand

Microsoft Access - [Service]

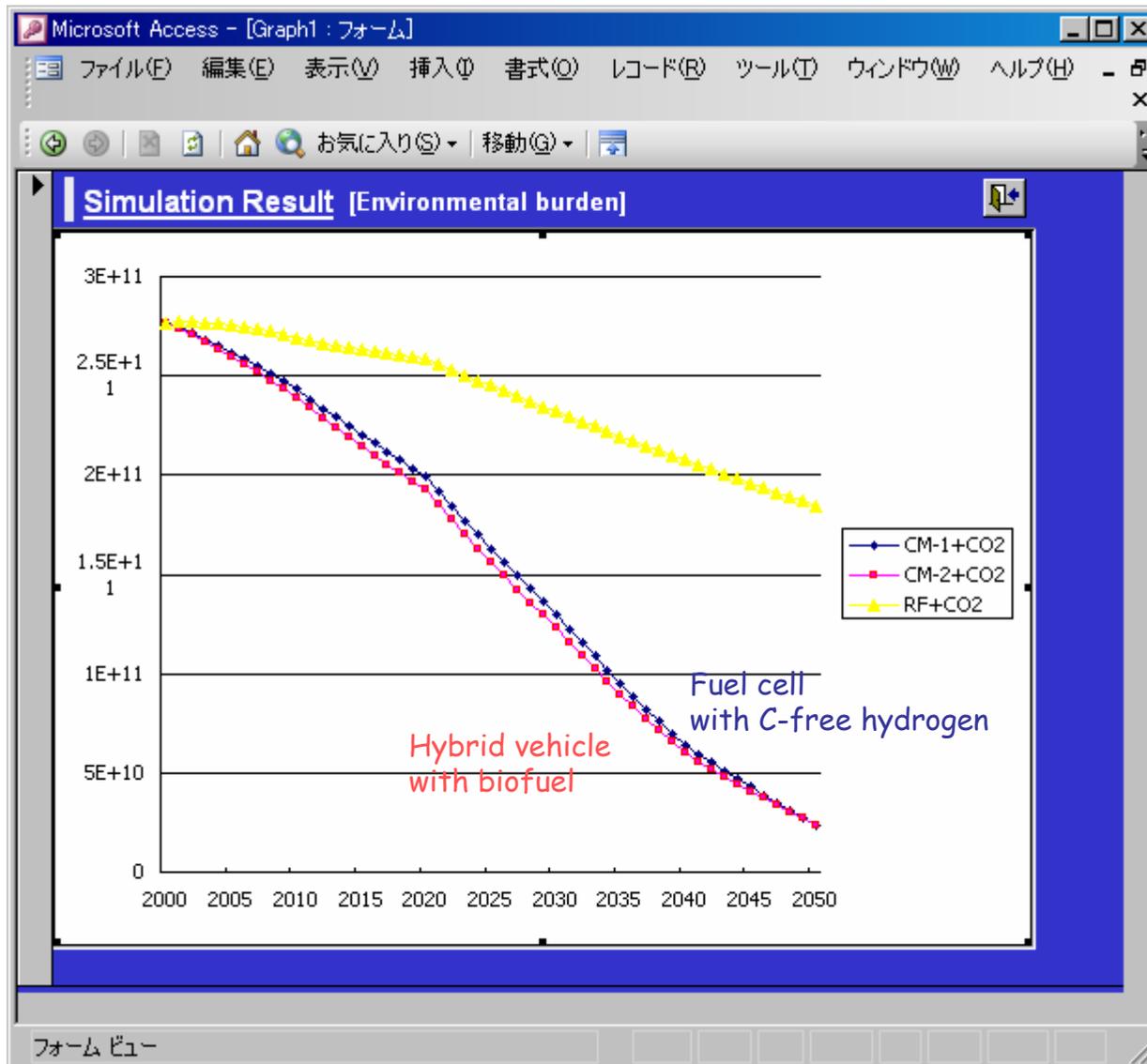
ファイル(F) 編集(E) 表示(V) 挿入(I) 書式(O) レコード(R) ツール(T) ウィンドウ(W) ヘルプ(H) 質問を入力してください

### Service Demand

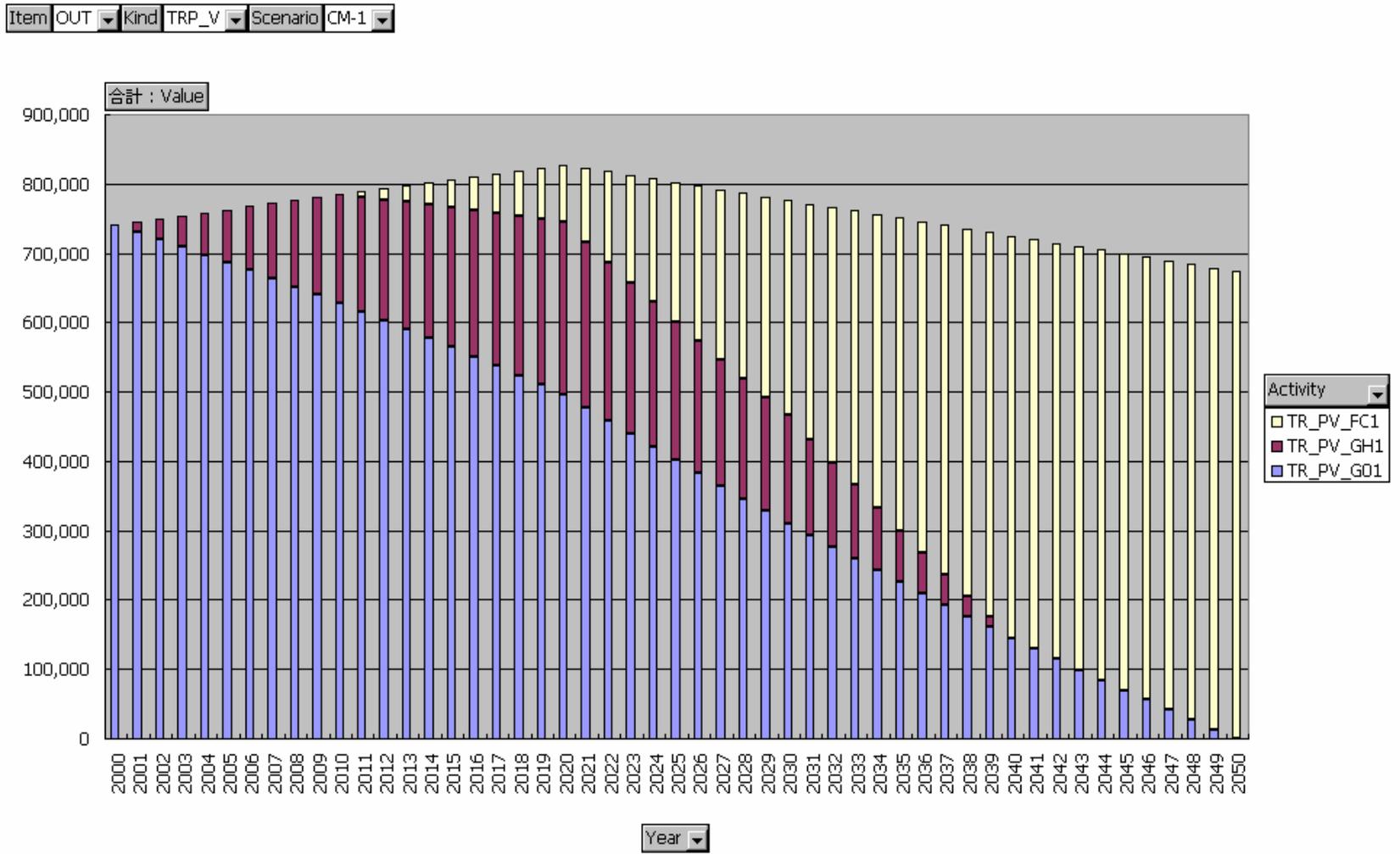
No.	Service type	Scenario	2000	2010	2020	2030	2040
601	[TRP_V]:PS. Vehicle (M Prs-km)	RF	741,146	784,421	827,695	776,328	724,960
605	[TRP_VB]:PS. Bus (M Prs-km)	RF	87,307	96,246	105,186	98,658	92,130
606	[TRP_RL]:PS. Rail (M Prs-km)	RF	384,441	428,635	472,829	443,485	414,141
607	[TRP_SH]:PS. Ship (M Prs-km)	RF	4,304	4,702	5,099	4,783	4,466
608	[TRP_AR]:PS. Air (M Prs-km)	RF	79,700	107,821	135,941	127,504	119,066
609	[TRF_VM]:FR. Vehicle M-size (M ton-km)	RF	10,275	7,883	5,491	5,150	4,809
610	[TRF_VL]:FR. Vehicle L-size (M ton-km)	RF	302,843	312,691	322,539	302,522	282,509
611	[TRF_RL]:FR. Rail (M ton-km)	RF	22,136	24,082	26,027	24,412	22,797
612	[TRF_SH]:FR. Ship (M ton-km)	RF	241,671	244,217	246,764	231,449	216,139
613	[TRF_AR]:FR. Air (M ton-km)	RF	1,075	1,361	1,647	1,545	1,443
1601	[TRP_V]:PS. Vehicle (M Prs-km)	CM-1	741,146	784,421	827,695	776,328	724,960
1605	[TRP_VB]:PS. Bus (M Prs-km)	CM-1	87,307	96,246	105,186	98,658	92,130
1606	[TRP_RL]:PS. Rail (M Prs-km)	CM-1	384,441	428,635	472,829	443,485	414,141
1607	[TRP_SH]:PS. Ship (M Prs-km)	CM-1	4,304	4,702	5,099	4,783	4,466
1608	[TRP_AR]:PS. Air (M Prs-km)	CM-1	79,700	107,821	135,941	127,504	119,066
1609	[TRF_VM]:FR. Vehicle M-size (M ton-km)	CM-1	10,275	7,883	5,491	5,150	4,809
1610	[TRF_VL]:FR. Vehicle L-size (M ton-km)	CM-1	302,843	312,691	322,539	302,522	282,509
1611	[TRF_RL]:FR. Rail (M ton-km)	CM-1	22,136	24,082	26,027	24,412	22,797
1612	[TRF_SH]:FR. Ship (M ton-km)	CM-1	241,671	244,217	246,764	231,449	216,139
1613	[TRF_AR]:FR. Air (M ton-km)	CM-1	1,075	1,361	1,647	1,545	1,443
2601	[TRP_V]:PS. Vehicle (M Prs-km)	CM-2	741,146	784,421	827,695	776,328	724,960
2605	[TRP_VB]:PS. Bus (M Prs-km)	CM-2	87,307	96,246	105,186	98,658	92,130
2606	[TRP_RL]:PS. Rail (M Prs-km)	CM-2	384,441	428,635	472,829	443,485	414,141
2607	[TRP_SH]:PS. Ship (M Prs-km)	CM-2	4,304	4,702	5,099	4,783	4,466
2608	[TRP_AR]:PS. Air (M Prs-km)	CM-2	79,700	107,821	135,941	127,504	119,066
2609	[TRF_VM]:FR. Vehicle M-size (M ton-km)	CM-2	10,275	7,883	5,491	5,150	4,809
2610	[TRF_VL]:FR. Vehicle L-size (M ton-km)	CM-2	302,843	312,691	322,539	302,522	282,509
2611	[TRF_RL]:FR. Rail (M ton-km)	CM-2	22,136	24,082	26,027	24,412	22,797
2612	[TRF_SH]:FR. Ship (M ton-km)	CM-2	241,671	244,217	246,764	231,449	216,139
2613	[TRF_AR]:FR. Air (M ton-km)	CM-2	1,075	1,361	1,647	1,545	1,443
*							

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# Simulation Results : CO<sub>2</sub> emission

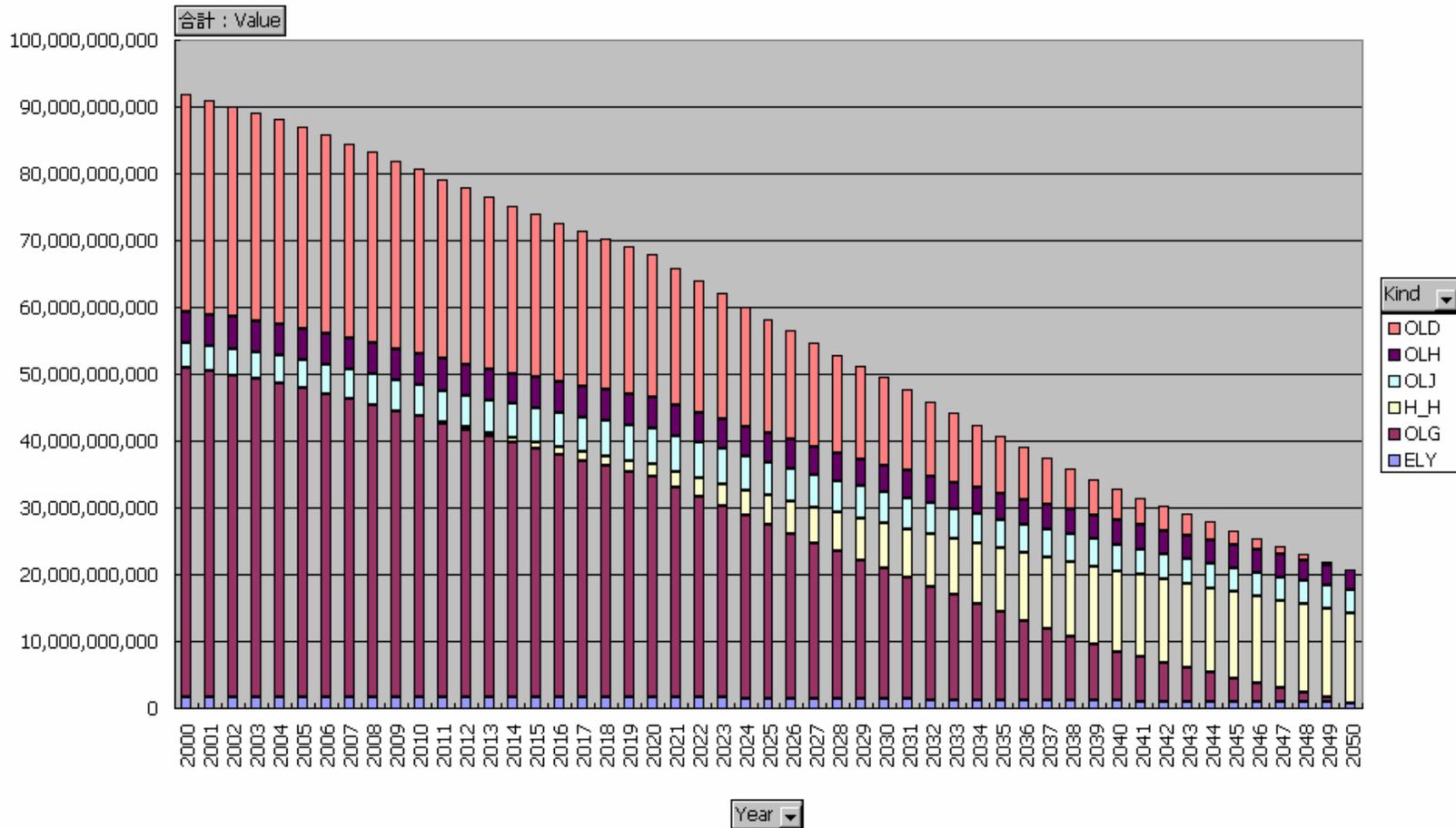


# Simulation Results : Output from activity



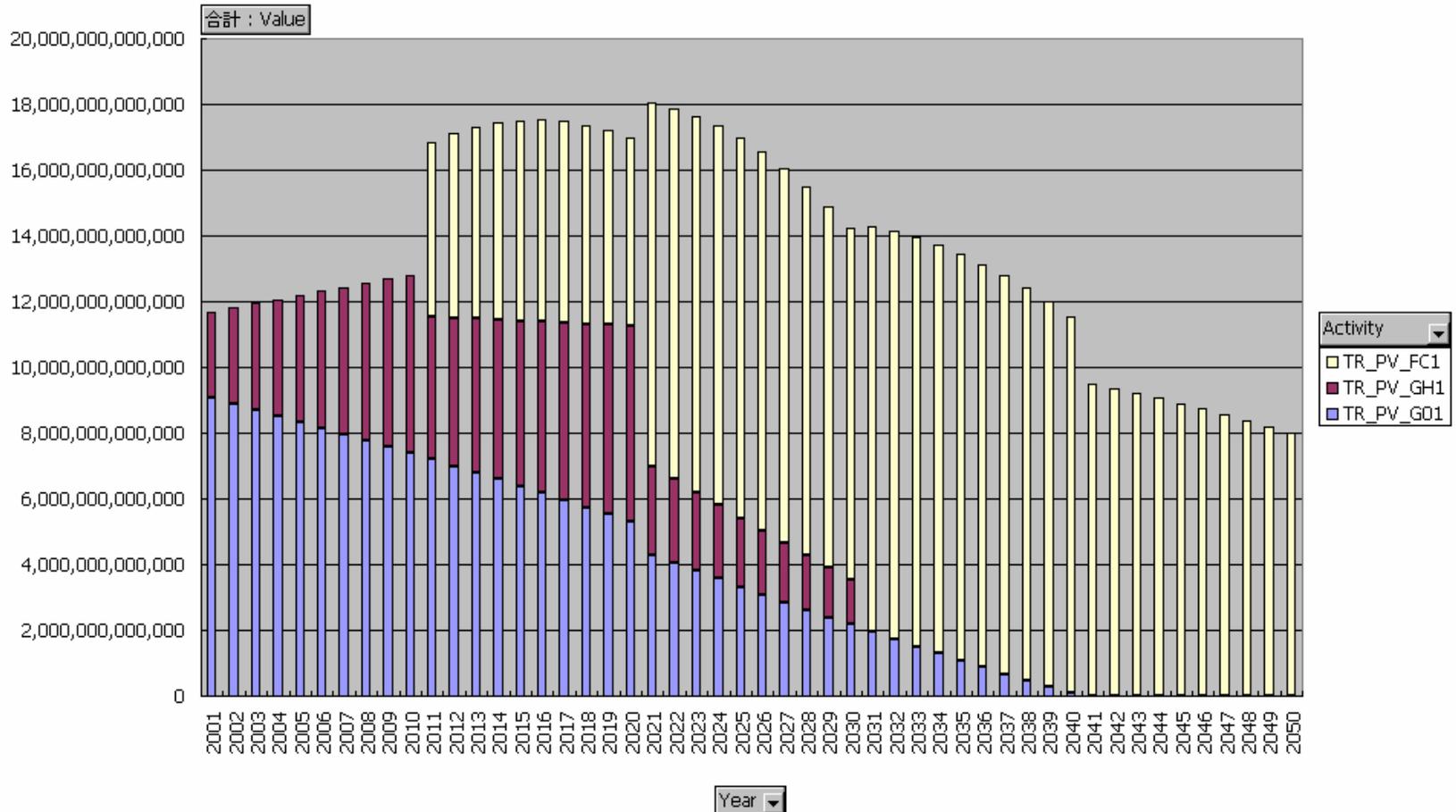
# Simulation Results : Energy consumption

Item IN Activity (すべて) Scenario CM-1

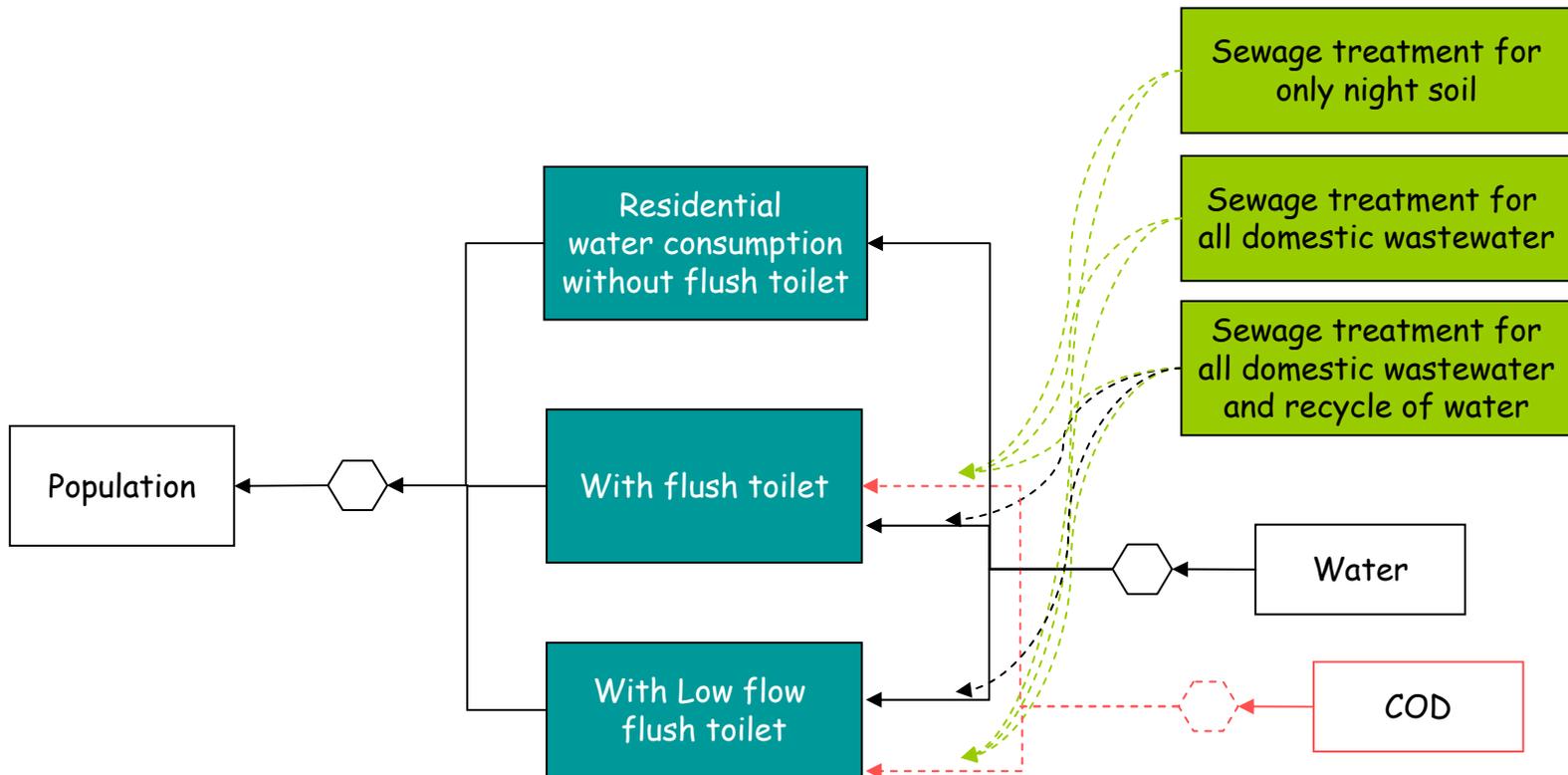


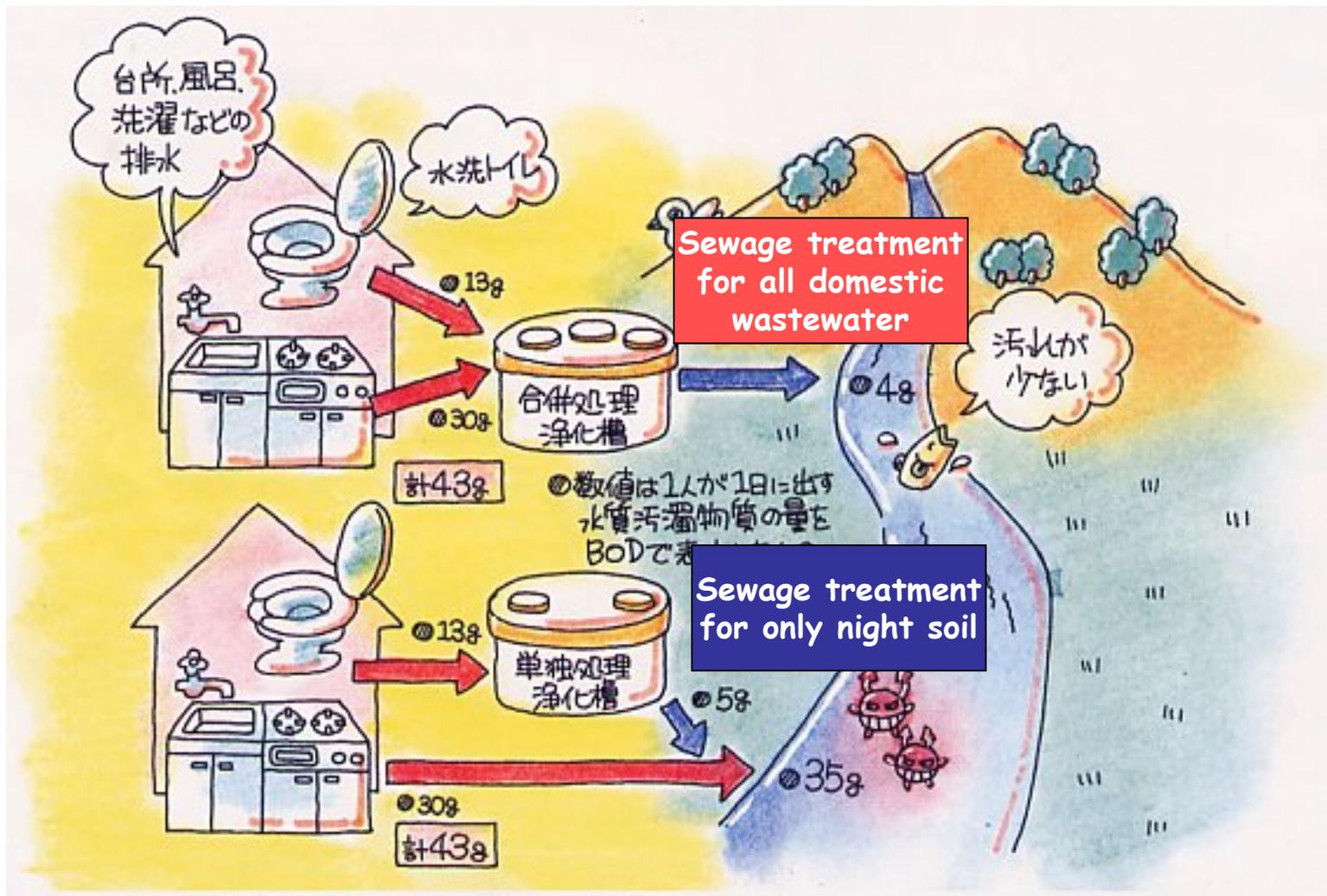
# Simulation Results : Cost for recruitment

Item RCI Scenario CM-1 Kind (すべて)



# 4. Application to water sector





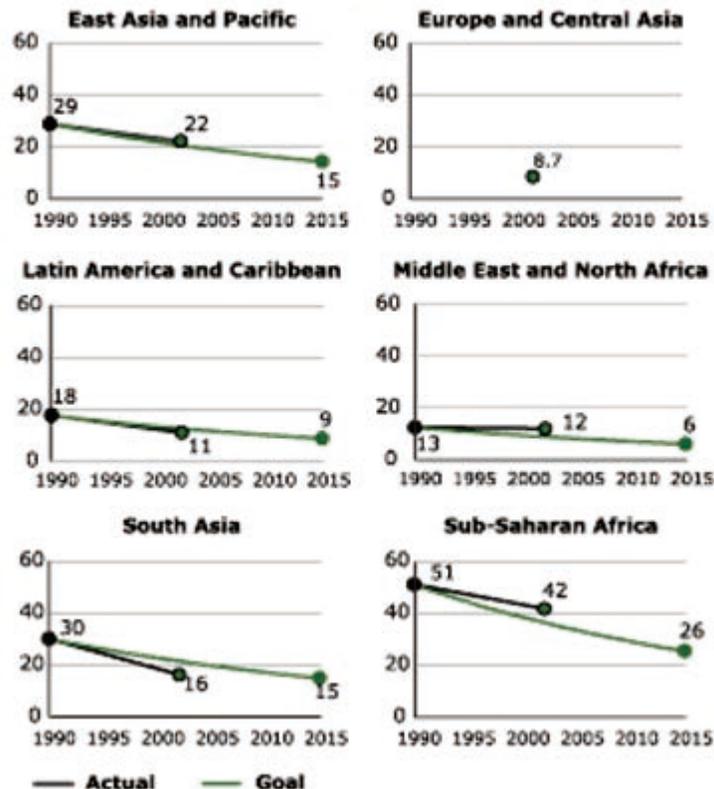
# Millennium Development Goal

## Target 10

Halve by 2015 the proportion of people without sustainable access to safe drinking water and basic sanitation.

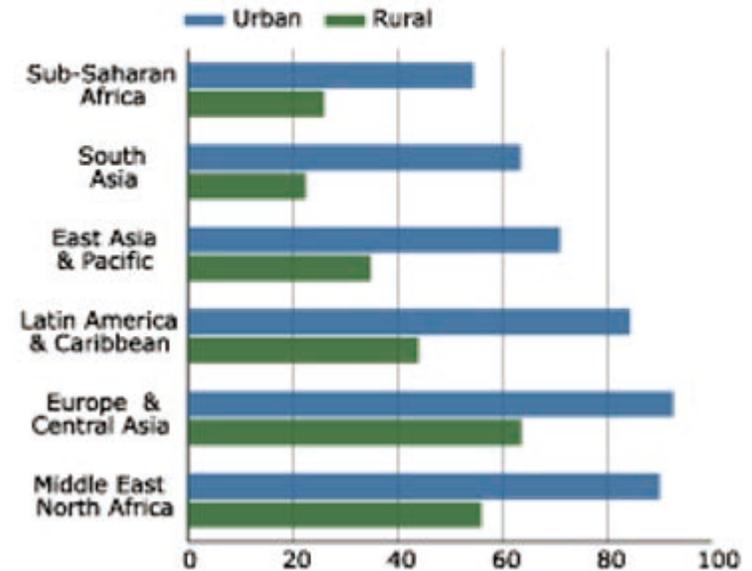
### Population without access to an improved water source

(%)



### Share of population with access to improved sanitation, 2002

(%)



## Mitigation of Water pollution

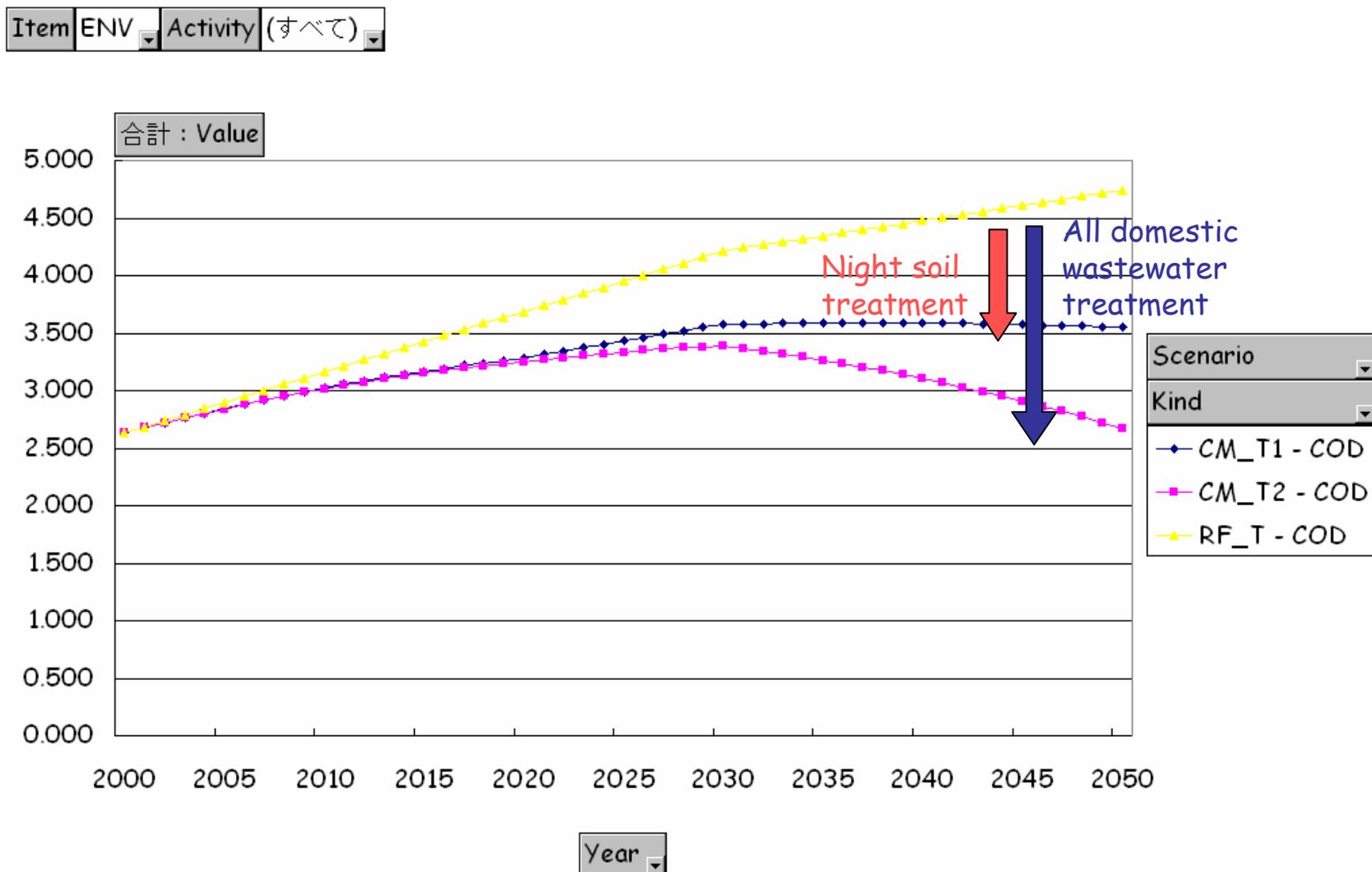
### Countermeasure 1

Flush toilet	30% (2000)	100% (2050)
<u>Sewage treatment for only night soil</u> (COD -27%)	30% (2000)	100% (2050)

### Countermeasure 2

Flush toilet	30% (2000)	100% (2050)
Sewage treatment for only night soil	30% (2000)	0% (2050)
<u>Sewage treatment for all domestic wastewater</u> (COD -90%)	0% (2000)	50% (2050)

# Simulation result : COD emission



## Mitigation of Water consumption

### Countermeasure 2

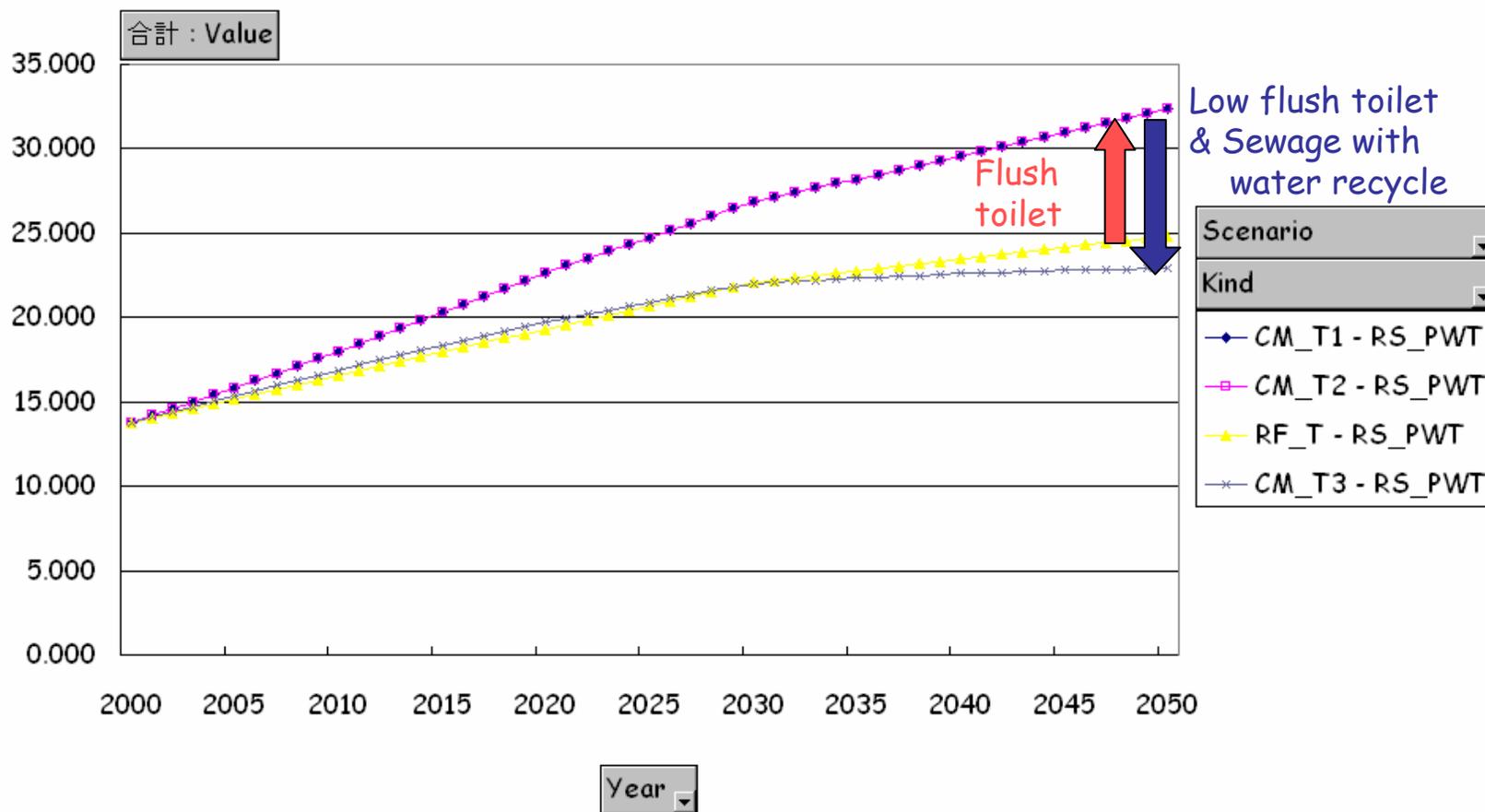
Flush toilet	30% (2000)	100% (2050)
Sewage treatment <u>for all domestic wastewater</u>	0% (2000)	50% (2050)

### Countermeasure 3

<u>Low flow flush toilet</u>	30% (2000)	100% (2050)
Sewage treatment for all domestic wastewater and <u>water recycle</u>	0% (2000)	50% (2050)

# Simulation result : Water consumption

Item IN Activity (すべて)



Finally,

we expect that you will apply the SDB to analyze the innovational strategies in your country and will introduce the effective strategies to achieve sustainable development.