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Folder Title:
Climate Policy Cost Estimates and Rules of Thumb

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Key estimates
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1st 1A7 table

MEMORANDUM

COUNCIL OF ECONOMIC ADVISERS

Oct 16, 1996

TO: JOE STIGLITZ, ALICIA MUNNELL, JEFF FRANKEL 

FROM: RAY PRINCE

SUBJECT: WHEN AND WHERE FLEXIBILITY

Attached are two graphs from a series of seminal papers by Tom Wigley (National Center for Atmospheric Research), Richard Richels (Electric Power Research Institute) and Jae Edmonds (Pacific NW labs) on the benefits of adopting policies with "When" and "Where" flexibility.

The first graph shows the estimated optimal time path of emissions for four different target levels of concentrations (target date: 2300; concentration levels: 350-750). All but the 350 path show the optimal level of emissions rising for several years after 1990 and then falling. As a benchmark, a concentration level of 650 ppm is expected to raise global temperatures 3 degrees centigrade above pre-industrial levels (2+ above current temperatures).

The second graph indicates the estimated cost of not setting the price or emissions levels at the optimal level nor having an adjustment mechanism that would get you back to the optimal path.

The "without when and where flexibility" scenario is based on each country having a set emissions target for each year based on their 1990 levels which are met at least cost.

The "When only" scenario assumes each country has an emissions budget which they spend optimally over time.

The "Where only" scenario assumes international emissions trading but a set world target for each year so that all potential intra-temporal efficiencies are captured (no banking or borrowing).

The "When and Where" scenario assumes a world emissions budget which is spent optimally over space and time so that all potential intra and inter-temporal efficiencies are captured.

IPCC EMISSIONS

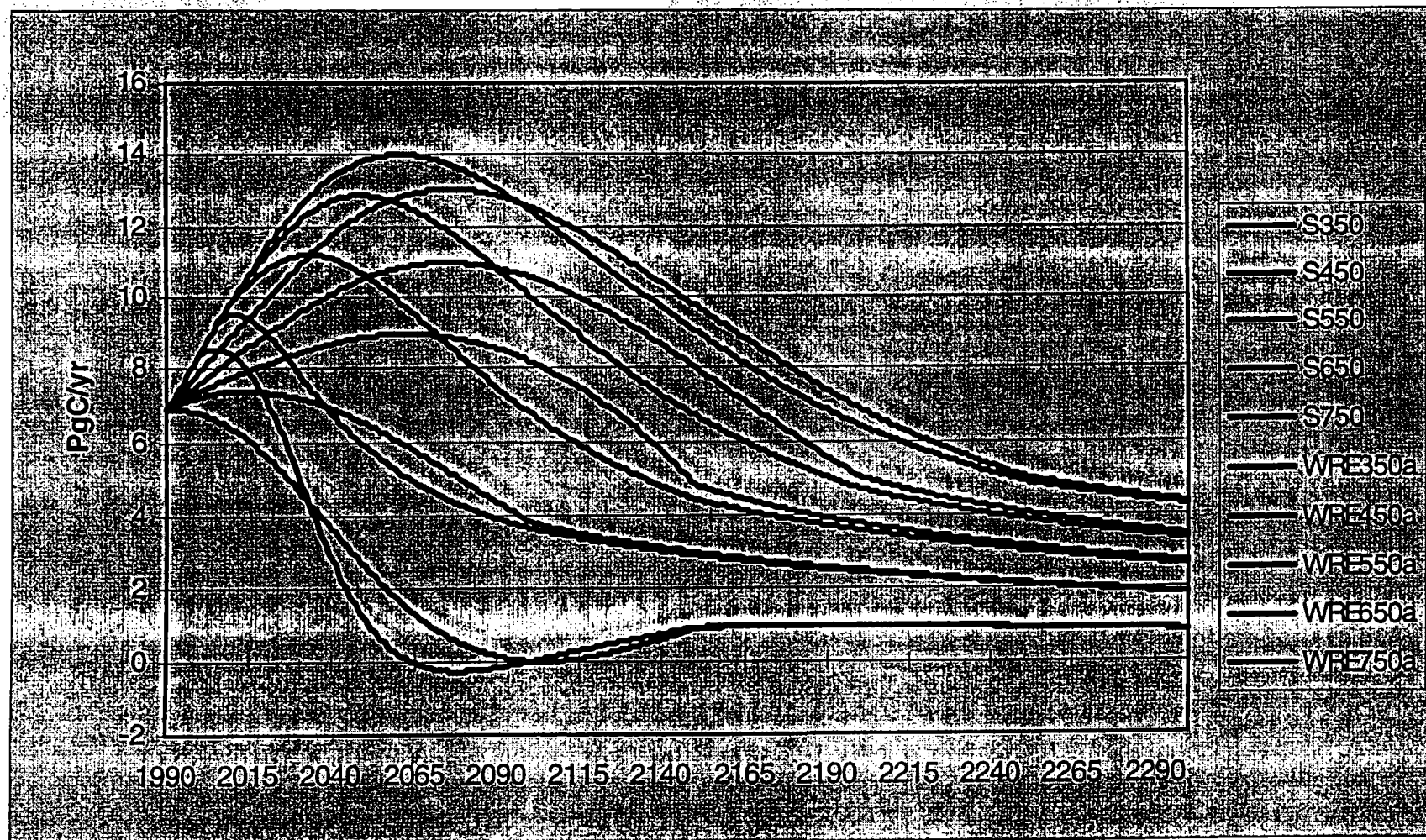
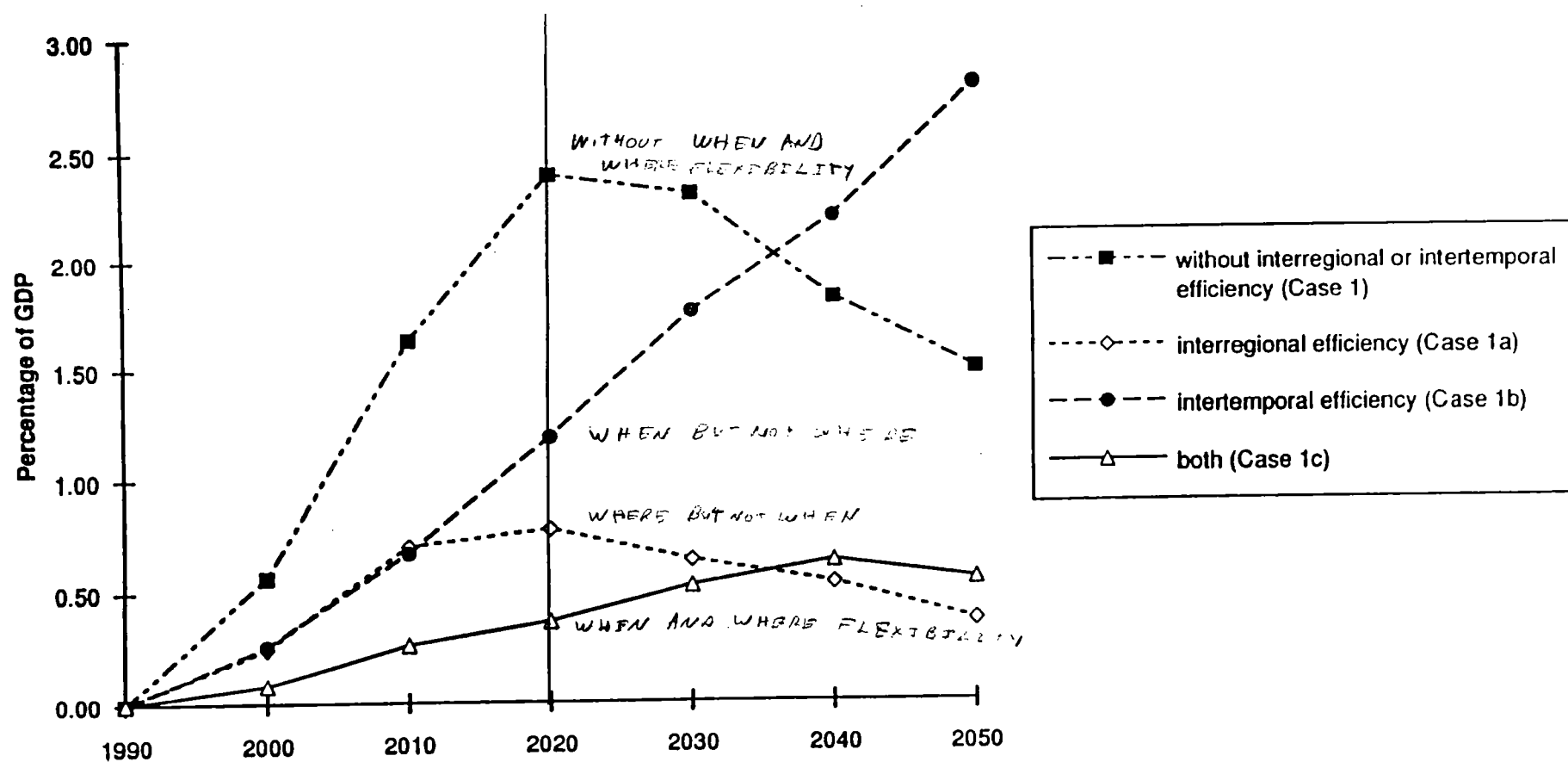


Figure 7. OECD GDP Losses under Alternative Assumptions about Economic Efficiency
(based on average of model results)



that by hanging carbon dioxide in 1990. Few at Britain is switched from o is Germany, in a lot of filthy r with the east. have done well. are nowhere near (see table). an Union is now in- icult target. It wants mit themselves legally by 15% from their 1990 EU accepts that poorer e treated more leniently: gal, for instance, could let rise by 30-40%. But if Ire- his sort of rise, what leeway owed the really poor? The Council reckons that poor l account for half of all car- : emissions by 2020. ted States, with the backing of ada and Japan, argues again- targets. On June 25th, before

From mess to messier

Carbon-dioxide emissions, m tonnes

	1990	Projected	
		2000	% change 1990-2000
Switzerland	44	42	-5
Britain	584	563	-4
Germany	983	945	-4
Netherlands	162	163	1
Denmark	53	55	4
Sweden	53	55	4
Belgium	109	113	4
Norway	32	34	6
Japan	1,068	1,128	6
Austria	59	65	10
France	379	417	10
Italy	408	447	10
United States	4,895	5,449	11
New Zealand	25	28	12
Canada	432	492	14
Ireland	33	38	15
Greece	73	89	22
Australia	265	328	24
Portugal	42	53	26
Spain	217	273	26
Finland	54	69	28
Turkey	138	238	72

Source: IEA

tries are le general, they are w agendas that might growth to comfort we particular, they compla not lived up to the prom. to help poor countries be ga ther straight cash or technolog

Some green help goes to th vironmental Facility, a \$2 b managed by the World Bank. tries would like to see the amoun and disbursements made less a The contributors are balking. Wha private finance, ask the rich. All ver answer the poor, but most investmen to a dozen countries. This would ch. counter the rich, if the less favoured o got their economic houses in order. Easi with more aid, say the poor. Then everyone goes to lunch.

So were the earth summits a waste? Not entirely. While deforestation, overfishing, greenhouse emissions, species extinction and water supply have all got worse since 1992, water quality has improved, and so have health and life expectancy. Fertility rates and emissions of lead, soot and chlorofluorocarbons are down.

There has also been some quiet progress, thanks in part to the heightened envi-

Recycling tax rev.

Symptoms effects of carbon
tax OF:

\$15/ton in SR

\$40/ton after 20 yrs

3 necessary tax rates raising p:
Coal ^{in SR} 322 after 20 yrs 84 2
oil 112 28 ?
nat. gas 147 37 ?
gasoline 42 10 ?

=> tax rev 2206 850-853

recycle by lump sum ?
corporate tax cuts ?
ITC

The Efficiency Value of Carbon Tax Revenues ^{Bd. reduction}

By Robert Shackleton, Michael Shelby, Alex Cristofaro, Roger Brinner, Joyce Yanchar, Lawrence Goulder, Dale Jorgenson, Peter Wilcoxon, Peter Pauly and Robert Kaufmann

The views expressed in this paper are those of the authors and do not represent the views of the U.S. Environmental Protection Agency.

Draft November 5, 1992

Comments welcome. Please send comments to

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From Literature

COMPARISON OF ESTIMATES OF US GDP AND WELFARE EFFECTS OF CARBON POLICIES

Policy	Carbon tax Lump sum recycling	Same	Same	Same	Same	Same	Same	Same	Same	Same	Auction Permits lump sum recycling to consumers starts in 2000
Target	Stabilize CO2 emissions at 1990 levels by 2020, tax starts in 2000	Same	Same	Same	Same	Same	\$15/ton starting in 1990, rises 5%/yr to \$39.80 in 2010	Same	Same	Same	Stabilize GHG at 1990 levels by 2010
Model(s)	CRTM	OECD, FOSSIL 12, ERM	MWC	DGEM	Goulder	GLOBAL 2100	DRI	LINK	Jorgenson Wilcoxon	Goulder	DRI paper
Source	Gaskins, AER, May 93, pp. 319, 321	Same	Same	Same	Same	Same	Shakelton, et.al. pp. 3, 15-6	Same	Same	Same	June 7 workshop pp, 3, 12

Effects=====											
Carbon Tax	\$150/ton (\$1990)	\$75/ton (\$1990)	\$75/ton (\$1990)	\$25/ton (\$1990)	\$25/ton (\$1990)	\$25/ton (\$1990)	\$39.80/ton (\$1990)	Same	Same	Same	\$125/ton by 2010 (\$1995)
Revenue	NA	NA	NA	NA	NA	NA	\$85 bil in 2010	Same	Same	Same	\$176.9 bil by 2010 (\$1995)
Change GDP	-0.50% in 2010	-0.25% in 2010	-0.50% in 2010	-0.60% in 2010	-0.30% in 2010	-0.75% in 2010	Chg.PV= -0.58% at 3% dr	Chg.PV= -0.46% at 3% dr	Chg.PV= -0.62% at 3% dr	Chg.PV= -0.24% at 3% dr	-0.75% in 2010
Change Welfare	NA	NA	NA	NA	NA	NA	NA	NA	Chg.PV= -0.83% at 7% dr*	Chg. PV= NA -0.44% at 7% dr*	NA
Notes										* social time pref.	social time pref.

Paper by Shakelton et al says that a tax reaching \$40/ton of carbon after 20 yrs
 = ΔP of 84% coal
 28% oil
 37% nat gas
 10% gasoline = 12%

20% in 1990
 = 24%

from Richels, Brander, Grunspacht
and Wisbey
August 1995 for CETA, EPPA, MERGE,
MINICAM models

Figure 7. OECD GDP Losses under Alternative Assumptions about Economic Efficiency
(based on average of model results)

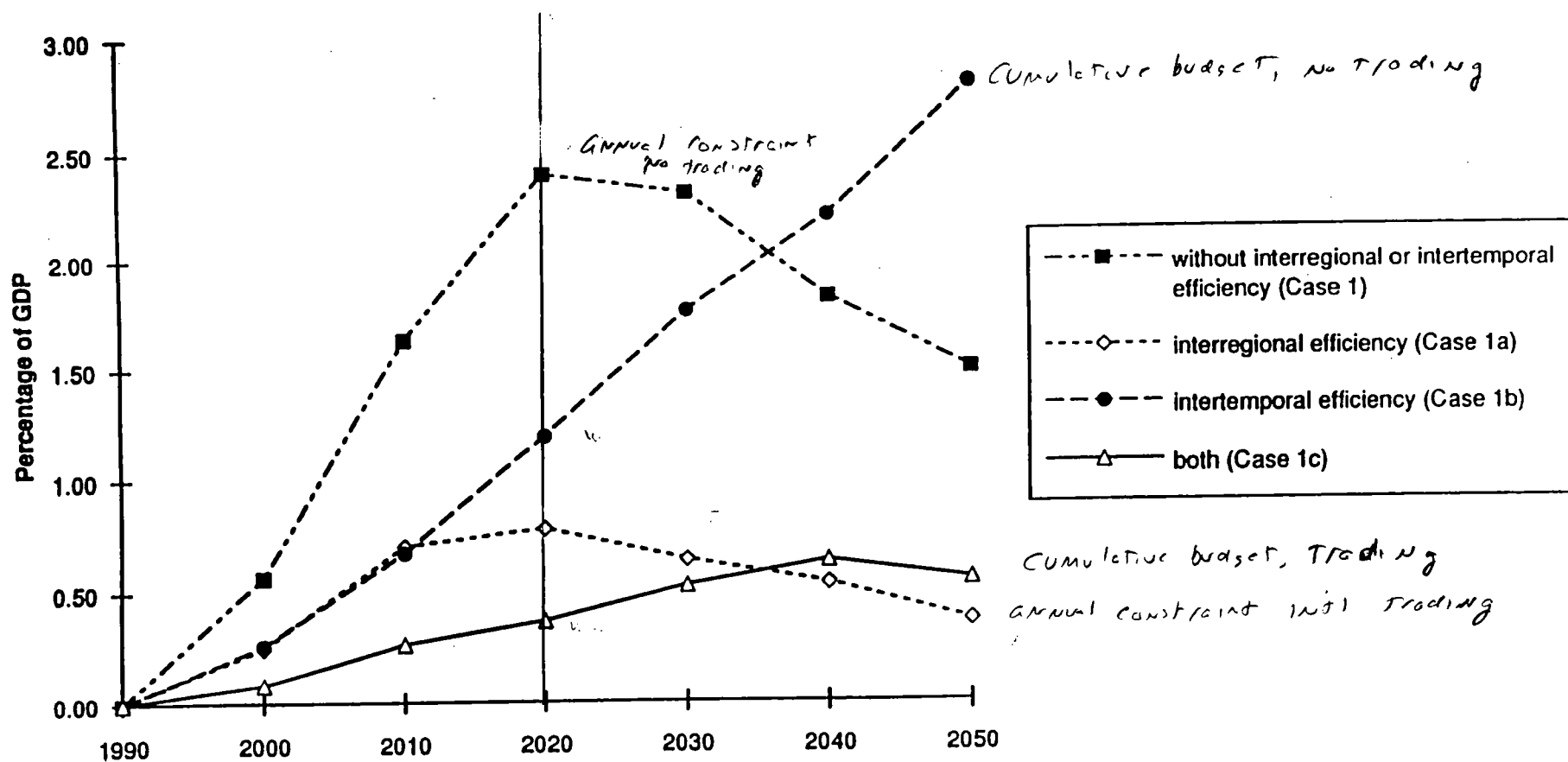


Table 6 Model classification and examples applied to CO₂ abatement costing

Sectoral division: Models/authors	Bottom-up				Top-down			
	Equilibrium (resource allocation)		Energy market/macro-economic		Growth		General	
	Partial	Linked	Partial	Linked	Partial	Linked	Partial	General
National	OTA NAS Mills (& many others)	MARKAL ETA-MACRO MARKAL-MACRO	DGEM (Jorgensen & Wilcoxon) Goulder Bergman Glomrod Proost & Van Regemorter	GDMEEM (N. Goto)	e.g. electricity market models Ingham & Ulph	LINK MDM (Barker) ORANI (Marks)		
Regional	EFOM	MIDAS				MIDAS-HERMES	QUEST HERMES G-CUBED (McKibben & Wilcoxon) DRI—Europe	
Global	Goldemberg	ERB	GREEN Whalley & Wigle WEDGE	(Optimizing) DICE (Nordhaus) (Non-optimizing) Anderson & Bird	e.g. International oil market models			

mization and simulation. Table 6 classifies the major models discussed in this paper according to this scheme, which has a pragmatic focus on the factors of greatest importance to abatement costing. Other classification approaches by Boero et al (71), and Beaver (60, 61) have similar elements but differ in detail.

6. NUMERICAL ASSUMPTIONS AND SENSITIVITIES

Assumptions drive model results. Critical parameters can be usefully (though not exclusively) divided into those that govern the overall scale of the system and reference missions, and those that directly affect the relative cost of emissions reductions. GNP and population growth rates, income elasticities and the rate of "autonomous end-use energy-intensity improvement" ("AEEI") primarily affect the baseline scale; background fossil-fuel prices strongly affect both the baseline emissions and abatement costs; the cost of low-carbon technologies and price elasticities largely drive abatement costs though they also affect baseline emissions.

6.1 Population and GNP Growth Rates

The demand for energy is driven by population and per capita energy demand, and all economic models at least assume that the latter is driven by per capita GNP. It is consequently much more difficult to restrict the growth in emissions for a developing country with a high population and economic growth rate, such as India, than for a more slowly growing developed economy, for example, Germany, which has a static or declining population.

The uncertainties in future global population are reflected in abatement studies; estimates for the year 2025 for example include 9.5 billion for the NAS (47) and 8.2 billion for Edmonds & Bams (81). However, the latter study found that there was little impact from a reduction in population growth for approximately 15 years, that is until labor force and therefore GNP was affected. Projections suggest that the increase in global GNP will be much greater and more uncertain than population growth, and so differences in GNP projections account for a greater part of variation in baseline emissions.

Different baseline GNP and energy demand assumptions across studies complicate comparisons of the GNP loss associated with a target CO₂ reduction. In models that derive GNP from labor productivity, this is correspondingly critical. For example, in the United States in 2020, GNP baseline estimates range from \$7.5 to \$11.5 trillion [CSIS (91) and Edmonds & Bams (82), respectively]; the low costs of CO₂ stabilization in the

GL CC

NEED
Equivalent of \$100 / ton
carbon tax

It could be smaller with trading !!

to reduce emissions to 1990 level

$\frac{\text{Energy}}{\text{GDP}}$ different countries
different prices

Alina

Tim Wirth told Garry
Don't worry

GLA

if no political consent for any of the
options being discussed

Kyoto
Admiral was not
Sure anything can be done.

~~GLA~~

Ray

What do the models

JNF
cc: RP

Post-It* Fax Note 7671		Date 10/18	# of pages 5
To Alicia Mennell		From Ray Serritoni	
Co./Dept. CEA		Co.	
Phone # 395-		Phone # 622-1301	
Fax # 395-6958		Fax # -1294	

10/29 FYI.

10/29 draft — not yet sent

To: Jeffrey R. Shafer
From: Joshua Gotbaum
Re: Climate Change Deputies Meeting, Oct. 24

Last week's Deputies' meeting raised important policy questions that deserve our continued attention. Rather than providing detailed notes about the meeting proper (I assume that Bill Schuerch, who attended the meeting, has briefed you on this), this memo will list my concerns about some of the policy questions raised.

In December, the U.S. will embark on a new round of negotiations on a climate treaty that could result in the most costly environmental program ever undertaken here. Richard Schmalensee of MIT, long prominent in the economics of climate change, puts the cost of stabilization in the US (20 years after controls are imposed) at one to four percent of GDP; that is, GDP in each year would be reduced by one to four percent from the baseline. For comparison, the US now spends about two percent of GDP on all environmental programs combined.

Choice of targets. Tim Wirth, who presented the State Department's brief, acknowledged the importance of flexibility in meeting a climate target. He pointed to language in recent U.S. statements calling for, among other things, carbon emissions trading, as a way of lowering the cost of climate programs. Treasury naturally supports more efficient ways of achieving a given goal. We remain concerned, however, that not enough attention is being paid to the goal itself.

Recommendation: The U.S. should not discuss the choice of climate targets at the Conference of the Parties in Geneva this December.

Costs and benefits of different targets. Alicia Munnell attempted to raise the question of costs and benefits of different greenhouse targets, making the point that the choice of a target should bear some relation to the costs and benefits of the alternatives, and asking that the Deputies be given some idea of the costs of the alternatives under consideration. Katie McGinty asserted that costs were irrelevant in the Deputies' decision, that it was the job of policymakers to decide on a policy; that costs should be considered only in implementing a policy. Dan Terullo responded that the process must be iterative, and that of course policymakers should be given information on the costs of the alternatives. We agree. We believe it would be dangerous and irresponsible to attempt to make policy decisions without considering the costs of alternatives.

Recommendation: The Deputies should not be asked to make policy decisions without adequate briefing on the measurable consequences of the alternatives.

Other concerns. Tim Wirth stated that "The science [about global warming] is for real. The

debate is over." While recent evidence has narrowed the remaining areas of disagreement, is certainly not true that we can set a course now once and for all, putting aside further considerations of science. Climate change policy will not be one decision, but rather a series of decisions taken over many decades, modified by evidence that surfaces in the meantime. The challenge today is to identify short-term strategies in the face of long-term uncertainty. The question is not, what is the best course over the next 100 years, but rather, what is the best course for the next few years, knowing that a prudent hedging strategy will allow time to learn and change course.

The U.S. should be wary about signing onto an early-action control path, as some countries have been urging. Such a path is expensive for three reasons: it requires the premature retirement of the capital stock, it fails to take advantage of technological changes, and it crowds out other productive investment. We will greatly increase the ultimate costs of any control program if we fail to acknowledge that new information will continue to become available, that technology will continue to change, that investment funds have alternative uses, and that hedging strategies can dramatically lower the total cost of any control program.

Recommendation: The U.S. should urge caution on early-action proposals.

Wirth also said three times that, "Diplomacy has at all times followed the science." This seems to me a serious misreading of what has taken place. We should recognize that the political decisions taken so far are just that -- political decisions, the result of the usual pulling and hauling of a political forum. This is not necessarily bad. But it would be a delusion to believe that decisions concerning gigantic resource reallocations made by consensus among 174 countries have been firmly rooted in science.

10/8 draft

To: Larry Summers
From: Joshua Gotbaum
Re: Climate Change Meeting with Tim Wirth

In July, at the second Conference of the Parties in Geneva, Tim Wirth announced a new U.S. position in the climate change negotiations: He called for binding targets and timetables to control greenhouse emissions in the medium term (2005 to 2010), and later added the U.S. to the other "Annex I" (developed) countries who had pledged to negotiate a new set of targets in 1997. U.S. negotiators plan to spend the next 15 months in detailed negotiations.

Treasury has not participated in policy development. As best we can tell, economic considerations do not seem to be primary. The costs of control even to current levels could be 1-4% of GDP and will vary substantially depending upon whether controls (a) apply to both developed and less-developed nations, and permit (b) trading of emissions rights across regions and (c) "banking" across time periods.

(There also appears to have been relatively limited review of the potential benefits of these controls. Many economists believe the costs of modest warming will be relatively small; some believe they net effects will be positive. Obviously, many in the environmental and scientific community strenuously disagree.)

Both elements of the business community (auto manufacturers and energy producers) and some in the environmental community who are sensitive to cost issues and the use of market-oriented control mechanisms (e.g., the Environmental Defense Fund) have urged Treasury to take a more active interest. Treasury was not invited to the NEC meetings leading up to this announcement. We were permitted to comment on a draft of Wirth's written statement, but were told that the basic policy decisions had already been made, so there was no use in challenging them. As we understand it Wirth's later pledge to negotiate further reduction targets was not cleared by the NEC at all.

Since the Geneva announcement, Wirth asked Ev Ehrlich to supervise an analysis of the economic effects of alternative control strategies. Ev has asked Treasury's office of Economic Policy and Tax Policy participate. It is unclear what role the analysis will play.

We are attempting to find out the views of other agencies on these issues.

Date: April 1,1997

To: Jeff Frankel

From: Jason Shogren
Tom Rhoads

RE: U.S. carbon emissions compared to 1990 levels

The following table provides an overview of U.S. carbon emissions.

Carbon Emissions (MMTC)--Total					
	1990	1995	Change from 1990 (%)	2000	Change from 1990 (%)
AEO97	1339	1424	6.3	1543	15.2
IEO96	1337	1413	5.7	1490	11.4
DRI	1338	1413	5.6	1516	13.3
SGM	1282	1401	9.3	1500	17.0
Markal Macro	1338	1424	6.4	1550	15.8

Rank	Country/Region	CO2 Emissions (000 metric tons)	% Global Total	Cumulative Percent
	World	22,339,408	100.00%	100.00%
1	United States	4,881,349	21.85%	21.85%
2	China	2,667,982	11.94%	33.79%
3	Russian Federation	2,103,132	9.41%	43.21%
4	Japan	1,093,470	4.89%	48.10%
5	Germany	878,136	3.93%	52.03%
6	India	769,440	3.44%	55.48%
7	Ukraine	611,342	2.74%	58.21%
8	United Kingdom	566,246	2.53%	60.75%
9	Canada	409,862	1.83%	62.58%
10	Italy	407,701	1.83%	64.41%
11	France	362,076	1.62%	66.03%
12	Poland, Rep	341,892	1.53%	67.56%
13	Mexico	332,852	1.49%	69.05%
14	Kazakhstan, Rep	297,982	1.33%	70.38%
15	South Africa	290,291	1.30%	71.68%
16	Korea, Rep	289,833	1.30%	72.98%
17	Australia	267,937	1.20%	74.18%
18	Korea, Dem People's	253,750	1.14%	75.32%
19	Iran, Islamic Rep	235,478	1.05%	76.37%
20	Spain	223,196	1.00%	77.37%
21	Saudi Arabia	220,620	0.99%	78.36%
22	Brazil	217,074	0.97%	79.33%
23	Indonesia	184,585	0.83%	80.16%
24	Turkey	145,490	0.65%	80.81%
25	Netherlands	139,027	0.62%	81.43%
26	Czech Rep	135,608	0.61%	82.04%
27	Uzbekistan, Rep	123,253	0.55%	82.59%
28	Romania	122,103	0.55%	83.13%
29	Argentina	117,003	0.52%	83.66%
30	Venezuela	116,424	0.52%	84.18%
31	Thailand	112,477	0.50%	84.68%
32	Belarus, Rep	102,028	0.46%	85.14%
33	Belgium	101,768	0.46%	85.59%
34	Nigeria	96,513	0.43%	86.03%
35	Egypt	83,997	0.38%	86.40%
36	Algeria	79,172	0.35%	86.76%
37	Greece	73,859	0.33%	87.09%
38	Pakistan	71,902	0.32%	87.41%
39	United Arab Emirates	70,616	0.32%	87.73%
40	Malaysia	70,492	0.32%	88.04%
41	Iraq	64,527	0.29%	88.33%
42	Azerbaijan	63,878	0.29%	88.62%
43	Colombia	61,493	0.28%	88.89%
44	Norway	60,247	0.27%	89.16%

45	Hungary	59,910	0.27%	89.43%
46	Sweden	56,796	0.25%	89.68%
47	Austria	56,572	0.25%	89.94%
48	Bulgaria	54,359	0.24%	90.18%
49	Denmark	53,897	0.24%	90.42%
50	Singapore	49,790	0.22%	90.64%
51	Philippines	49,698	0.22%	90.87%
52	Portugal	47,181	0.21%	91.08%
53	Switzerland	43,701	0.20%	91.27%
54	Syrian Arab Rep	42,407	0.19%	91.46%
55	Turkmenistan, Rep	42,257	0.19%	91.65%
56	Israel	41,605	0.19%	91.84%
57	Finland	41,176	0.18%	92.02%
58	Libya	39,520	0.18%	92.20%
59	Yugoslavia, Fed Rep	38,197	0.17%	92.37%
60	Slovak Rep	36,999	0.17%	92.54%
61	Chile	34,738	0.16%	92.69%
62	Ireland	30,851	0.14%	92.83%
63	Cuba	28,623	0.13%	92.96%
64	Morocco	27,344	0.12%	93.08%
65	New Zealand	26,179	0.12%	93.20%
66	WORLD	22,339	0.10%	93.30%
67	Peru	22,277	0.10%	93.40%
68	Lithuania, Rep	22,006	0.10%	93.50%
69	Viet Nam	21,522	0.10%	93.59%
70	Estonia, Rep	20,885	0.09%	93.69%
71	Trinidad and Tobago	20,643	0.09%	93.78%
72	Ecuador	18,888	0.08%	93.86%
73	Zimbabwe	18,675	0.08%	93.95%
74	Bangladesh	17,217	0.08%	94.02%
75	Croatia, Rep	16,210	0.07%	94.10%
76	Kuwait	15,971	0.07%	94.17%
77	Kyrgyz Rep	15,374	0.07%	94.24%
78	Bosnia and Herzegovi	15,055	0.07%	94.30%
79	Latvia, Rep	14,781	0.07%	94.37%
80	Moldova, Rep	14,209	0.06%	94.43%
81	Georgia, Rep	13,839	0.06%	94.50%
82	Tunisia	13,560	0.06%	94.56%
83	Jordan	11,311	0.05%	94.61%
84	Lebanon	11,051	0.05%	94.66%
85	Dominican Rep	10,248	0.05%	94.70%
86	Yemen, Rep	10,083	0.05%	94.75%
87	Oman	10,036	0.04%	94.79%
88	Mongolia	9,281	0.04%	94.83%
89	Jamaica	8,042	0.04%	94.87%
90	Bolivia	6,632	0.03%	94.90%
91	Cote d'Ivoire	6,309	0.03%	94.93%
92	Guatemala	5,657	0.03%	94.95%
93	Gabon	5,569	0.02%	94.98%

94	Slovenia, Rep	5,503	0.02%	95.00%
95	Kenya	5,342	0.02%	95.03%
96	Uruguay	5,038	0.02%	95.05%
97	Sri Lanka	4,972	0.02%	95.07%
98	Angola	4,525	0.02%	95.09%
99	Myanmar	4,386	0.02%	95.11%
100	Panama	4,228	0.02%	95.13%
101	Armenia	4,199	0.02%	95.15%
102	Zaire	4,181	0.02%	95.17%
103	Macedonia, former Yu	4,100	0.02%	95.19%
104	Congo	3,972	0.02%	95.20%
105	Tajikistan, Rep	3,972	0.02%	95.22%
106	Albania	3,968	0.02%	95.24%
107	Costa Rica	3,807	0.02%	95.26%
108	Ghana	3,781	0.02%	95.27%
109	El Salvador	3,550	0.02%	95.29%
110	Sudan	3,462	0.02%	95.30%
111	Honduras	3,059	0.01%	95.32%
112	Ethiopia	2,906	0.01%	95.33%
113	Mauritania	2,869	0.01%	95.34%
114	Senegal	2,810	0.01%	95.36%
115	Paraguay	2,620	0.01%	95.37%
116	Nicaragua	2,495	0.01%	95.38%
117	Zambia	2,481	0.01%	95.39%
118	Papua New Guinea	2,257	0.01%	95.40%
119	Cameroon	2,231	0.01%	95.41%
120	Botswana	2,173	0.01%	95.42%
121	Tanzania	2,103	0.01%	95.43%
122	Suriname	2,008	0.01%	95.44%
123	Iceland	1,777	0.01%	95.45%
124	Afghanistan, Islamic S	1,392	0.01%	95.45%
125	Mauritius	1,356	0.01%	95.46%
126	Nepal	1,297	0.01%	95.47%
127	Niger	1,085	0.00%	95.47%
128	Guinea	1,026	0.00%	95.47%
129	Mozambique	997	0.00%	95.48%
130	Uganda	953	0.00%	95.48%
131	Madagascar	945	0.00%	95.49%
132	Guyana	835	0.00%	95.49%
133	Haiti	784	0.00%	95.50%
134	Togo	733	0.00%	95.50%
135	Fiji	711	0.00%	95.50%
136	Malawi	652	0.00%	95.50%
137	Benin	612	0.00%	95.51%
138	Burkina Faso	557	0.00%	95.51%
139	Cambodia	476	0.00%	95.51%
140	Rwanda	451	0.00%	95.51%
141	Mali	443	0.00%	95.52%
142	Sierra Leone	432	0.00%	95.52%

143	Liberia	278	0.00%	95.52%
144	Lao People's Dem Re	271	0.00%	95.52%
145	Swaziland	267	0.00%	95.52%
146	Belize	264	0.00%	95.52%
147	Chad	253	0.00%	95.52%
148	Central African Rep	216	0.00%	95.52%
149	Guinea-Bissau	209	0.00%	95.53%
150	Gambia, The	198	0.00%	95.53%
151	Burundi	191	0.00%	95.53%
152	Solomon Islands	161	0.00%	95.53%
153	Bhutan	132	0.00%	95.53%
154	Equatorial Guinea	117	0.00%	95.53%
155	Somalia	15	0.00%	95.53%

Rank	Country/Region	CO2 Emissions (000 metric tons)	CO2 from Land Use (000 metric tons)	Total CO2 (000 metric tons)	% Global Total	Cumulative Percent
	WORLD	22,339,408	4,100,000	26,439,408	100.00%	100.00%
1	United States	4,881,349	X	4,881,349	18.46%	18.46%
2	China	2,667,982	150,000	2,817,982	10.66%	29.12%
3	Russian Federation	2,103,132	X	2,103,132	7.95%	37.08%
4	Brazil	217,074	1,100,000	1,317,074	4.98%	42.06%
5	Japan	1,093,470	X	1,093,470	4.14%	46.19%
6	Germany	878,136	X	878,136	3.32%	49.51%
7	India	769,440	65,000	834,440	3.16%	52.67%
8	Ukraine	611,342	X	611,342	2.31%	54.98%
9	Indonesia	184,585	410,000	594,585	2.25%	57.23%
10	United Kingdom	566,246	X	566,246	2.14%	59.37%
11	Canada	409,862	X	409,862	1.55%	60.92%
12	Italy	407,701	X	407,701	1.54%	62.46%
13	Mexico	332,852	63,000	395,852	1.50%	63.96%
14	France	362,076	X	362,076	1.37%	65.33%
15	Poland, Rep	341,892	X	341,892	1.29%	66.62%
16	South Africa	290,291	14,000	304,291	1.15%	67.78%
17	Kazakhstan, Rep	297,982	X	297,982	1.13%	68.90%
18	Korea, Rep	289,833	1,500	291,333	1.10%	70.00%
19	Venezuela	116,424	170,000	286,424	1.08%	71.09%
20	Zaire	4,181	280,000	284,181	1.07%	72.16%
21	Malaysia	70,492	210,000	280,492	1.06%	73.22%
22	Australia	267,937	X	267,937	1.01%	74.24%
23	Korea, Dem People's	253,750	700	254,450	0.96%	75.20%
24	Iran, Islamic Rep	235,478	10,000	245,478	0.93%	76.13%
25	Spain	223,196	X	223,196	0.84%	76.97%
26	Saudi Arabia	220,620	60	220,680	0.83%	77.81%
27	Thailand	112,477	92,000	204,477	0.77%	78.58%
28	Argentina	117,003	85,000	202,003	0.76%	79.34%
29	Colombia	61,493	110,000	171,493	0.65%	79.99%
30	Philippines	49,698	110,000	159,698	0.60%	80.60%
31	Bolivia	6,632	140,000	146,632	0.55%	81.15%
32	Turkey	145,490	X	145,490	0.55%	81.70%
33	Netherlands	139,027	X	139,027	0.53%	82.23%
34	Czech Rep	135,608	X	135,608	0.51%	82.74%
35	Myanmar	4,386	130,000	134,386	0.51%	83.25%
36	Uzbekistan, Rep	123,253	X	123,253	0.47%	83.71%
37	Romania	122,103	X	122,103	0.46%	84.18%
38	Nigeria	96,513	24,000	120,513	0.46%	84.63%
39	Peru	22,277	96,000	118,277	0.45%	85.08%
40	Belarus, Rep	102,028	X	102,028	0.39%	85.47%
41	Belgium	101,768	X	101,768	0.38%	85.85%
42	Ecuador	18,888	72,000	90,888	0.34%	86.19%
43	Algeria	79,172	6,900	86,072	0.33%	86.52%
44	Pakistan	71,902	14,000	85,902	0.32%	86.84%
45	Egypt	83,997	X	83,997	0.32%	87.16%

46	Greece	73,859	X	73,859	0.28%	87.44%
47	United Arab Emirates	70,616	X	70,616	0.27%	87.71%
48	Chile	34,738	33,000	67,738	0.26%	87.96%
49	Iraq	64,527	24	64,551	0.24%	88.21%
50	Azerbaijan	63,878	X	63,878	0.24%	88.45%
51	Viet Nam	21,522	40,000	61,522	0.23%	88.68%
52	Norway	60,247	X	60,247	0.23%	88.91%
53	Hungary	59,910	X	59,910	0.23%	89.14%
54	Sweden	56,796	X	56,796	0.21%	89.35%
55	Austria	56,572	X	56,572	0.21%	89.57%
56	Gabon	5,569	51,000	56,569	0.21%	89.78%
57	Bulgaria	54,359	X	54,359	0.21%	89.99%
58	Denmark	53,897	X	53,897	0.20%	90.19%
59	Singapore	49,790	X	49,790	0.19%	90.38%
60	Portugal	47,181	X	47,181	0.18%	90.56%
61	Switzerland	43,701	X	43,701	0.17%	90.72%
62	Syrian Arab Rep	42,407	790	43,197	0.16%	90.89%
63	Turkmenistan, Rep	42,257	X	42,257	0.16%	91.05%
64	Israel	41,605	X	41,605	0.16%	91.20%
65	Sudan	3,462	38,000	41,462	0.16%	91.36%
66	Finland	41,176	X	41,176	0.16%	91.52%
67	Libya	39,520	76	39,596	0.15%	91.66%
68	Yugoslavia, Fed Rep	38,197	X	38,197	0.14%	91.81%
69	Paraguay	2,620	35,000	37,620	0.14%	91.95%
70	Lao People's Dem Re	271	37,000	37,271	0.14%	92.09%
71	Papua New Guinea	2,257	35,000	37,257	0.14%	92.23%
72	Slovak Rep	36,999	X	36,999	0.14%	92.37%
73	Zambia	2,481	34,000	36,481	0.14%	92.51%
74	Nicaragua	2,495	33,000	35,495	0.13%	92.65%
75	Cambodia	476	35,000	35,476	0.13%	92.78%
76	Morocco	27,344	4,700	32,044	0.12%	92.90%
77	Cuba	28,623	3,200	31,823	0.12%	93.02%
78	Ireland	30,851	X	30,851	0.12%	93.14%
79	Cameroon	2,231	28,000	30,231	0.11%	93.25%
80	Guatemala	5,657	21,000	26,657	0.10%	93.35%
81	New Zealand	26,179	X	26,179	0.10%	93.45%
82	Panama	4,228	21,000	25,228	0.10%	93.55%
83	Bangladesh	17,217	7,700	24,917	0.09%	93.64%
84	Tanzania	2,103	22,000	24,103	0.09%	93.73%
85	Zimbabwe	18,675	5,300	23,975	0.09%	93.82%
86	Central African Rep	216	23,000	23,216	0.09%	93.91%
87	Honduras	3,059	19,000	22,059	0.08%	94.00%
88	Lithuania, Rep	22,006	X	22,006	0.08%	94.08%
89	Madagascar	945	21,000	21,945	0.08%	94.16%
90	Trinidad and Tobago	20,643	1,200	21,843	0.08%	94.24%
91	Ghana	3,781	18,000	21,781	0.08%	94.33%
92	Cote d'Ivoire	6,309	15,000	21,309	0.08%	94.41%
93	Estonia, Rep	20,885	X	20,885	0.08%	94.49%
94	Angola	4,525	16,000	20,525	0.08%	94.56%

95	Congo	3,972	14,000	17,972	0.07%	94.63%
96	Costa Rica	3,807	14,000	17,807	0.07%	94.70%
97	Croatia, Rep	16,210	X	16,210	0.06%	94.76%
98	Mozambique	997	15,000	15,997	0.06%	94.82%
99	Kuwait	15,971	X	15,971	0.06%	94.88%
100	Kyrgyz Rep	15,374	X	15,374	0.06%	94.94%
101	Jamaica	8,042	7,200	15,242	0.06%	95.00%
102	Bosnia and Herzegovi	15,055	X	15,055	0.06%	95.05%
103	Dominican Rep	10,248	4,800	15,048	0.06%	95.11%
104	Latvia, Rep	14,781	X	14,781	0.06%	95.17%
105	Moldova, Rep	14,209	X	14,209	0.05%	95.22%
106	Tunisia	13,560	640	14,200	0.05%	95.27%
107	Georgia, Rep	13,839	X	13,839	0.05%	95.33%
108	Malawi	652	11,000	11,652	0.04%	95.37%
109	Jordan	11,311	97	11,408	0.04%	95.41%
110	Lebanon	11,051	91	11,142	0.04%	95.46%
111	Guinea	1,026	10,000	11,026	0.04%	95.50%
112	Ethiopia	2,906	8,000	10,906	0.04%	95.54%
113	Nepal	1,297	9,000	10,297	0.04%	95.58%
114	Yemen, Rep	10,083	X	10,083	0.04%	95.62%
115	Oman	10,036	X	10,036	0.04%	95.65%
116	Liberia	278	9,600	9,878	0.04%	95.69%
117	Mongolia	9,281	480	9,761	0.04%	95.73%
118	Sri Lanka	4,972	4,300	9,272	0.04%	95.76%
119	Mali	443	8,400	8,843	0.03%	95.80%
120	Guyana	835	6,900	7,735	0.03%	95.83%
121	Senegal	2,810	4,700	7,510	0.03%	95.85%
122	Chad	253	7,100	7,353	0.03%	95.88%
123	Suriname	2,008	5,100	7,108	0.03%	95.91%
124	Kenya	5,342	1,400	6,742	0.03%	95.93%
125	Uruguay	5,038	1,300	6,338	0.02%	95.96%
126	Uganda	953	5,000	5,953	0.02%	95.98%
127	Slovenia, Rep	5,503	X	5,503	0.02%	96.00%
128	Botswana	2,173	3,200	5,373	0.02%	96.02%
129	Bhutan	132	4,500	4,632	0.02%	96.04%
130	Armenia	4,199	X	4,199	0.02%	96.06%
131	Macedonia, former Yu	4,100	X	4,100	0.02%	96.07%
132	El Salvador	3,550	520	4,070	0.02%	96.09%
133	Tajikistan, Rep	3,972	X	3,972	0.02%	96.10%
134	Albania	3,968	X	3,968	0.02%	96.12%
135	Burkina Faso	557	3,400	3,957	0.01%	96.13%
136	Benin	612	3,200	3,812	0.01%	96.15%
137	Equatorial Guinea	117	3,000	3,117	0.01%	96.16%
138	Mauritania	2,869	1	2,870	0.01%	96.17%
139	Togo	733	2,100	2,833	0.01%	96.18%
140	Afghanistan, Islamic S	1,392	1,100	2,492	0.01%	96.19%
141	Sierra Leone	432	1,800	2,232	0.01%	96.20%
142	Fiji	711	1,400	2,111	0.01%	96.21%
143	Guinea-Bissau	209	1,800	2,009	0.01%	96.21%

144	Solomon Islands	161	1,800	1,961	0.01%	96.22%
145	Namibia	X	1,800	1,800	0.01%	96.23%
146	Iceland	1,777	X	1,777	0.01%	96.23%
147	Mauritius	1,356	9	1,365	0.01%	96.24%
148	Haiti	784	470	1,254	0.00%	96.24%
149	Belize	264	980	1,244	0.00%	96.25%
150	Niger	1,085	X	1,085	0.00%	96.25%
151	Swaziland	267	370	637	0.00%	96.25%
152	Rwanda	451	170	621	0.00%	96.26%
153	Somalia	15	430	445	0.00%	96.26%
154	Gambia, The	198	130	328	0.00%	96.26%
155	Burundi	191	130	321	0.00%	96.26%
156	Eritrea	X	X	X		
157	Lesotho	X	X	X		

Country/Region	CO2 Emissions (000 metric tons)	Per Capita CO2 Emissions (metric tons)	% Global Emissions	Cumulative Percent
United Arab Emirates	70,616	42.28	0.32%	0.32%
United States	4,881,349	19.13	21.85%	22.17%
Singapore	49,790	17.99	0.22%	22.39%
Kazakhstan, Rep	297,982	17.48	1.33%	23.72%
Trinidad & Tobago	20,643	16.3	0.09%	23.82%
Australia	267,937	15.24	1.20%	25.02%
Canada	409,862	14.99	1.83%	26.85%
Russian Federation	2,103,132	14.11	9.41%	36.26%
Norway	60,247	14.03	0.27%	36.53%
Saudi Arabia	220,620	13.85	0.99%	37.52%
Estonia, Rep	20,885	13.19	0.09%	37.62%
Czech Rep	135,608	13.04	0.61%	38.22%
Ukraine	611,342	11.72	2.74%	40.96%
Korea, Dem People's Re	253,750	11.21	1.14%	42.09%
Germany	878,136	10.96	3.93%	46.03%
Turkmenistan, Rep	42,257	10.96	0.19%	46.21%
Denmark	53,897	10.44	0.24%	46.46%
Belgium	101,768	10.19	0.46%	46.91%
Belarus, Rep	102,028	9.89	0.46%	47.37%
United Kingdom	566,246	9.78	2.53%	49.90%
Netherlands	139,027	9.16	0.62%	50.53%
Poland, Rep	341,892	8.9	1.53%	52.06%
Ireland	30,851	8.87	0.14%	52.19%
Japan	1,093,470	8.79	4.89%	57.09%
Azerbaijan	63,878	8.76	0.29%	57.37%
Finland	41,176	8.21	0.18%	57.56%
Libya	39,520	8.1	0.18%	57.74%
Israel	41,605	8.1	0.19%	57.92%
Kuwait	15,971	8.1	0.07%	57.99%
New Zealand	26,179	7.58	0.12%	58.11%
South Africa	290,291	7.29	1.30%	59.41%
Austria	56,572	7.29	0.25%	59.66%
Greece	73,859	7.25	0.33%	59.99%
Italy	407,701	7.03	1.83%	61.82%
Slovak Rep	36,999	7	0.17%	61.99%
Iceland	1,777	6.85	0.01%	61.99%
Sweden	56,796	6.56	0.25%	62.25%
Korea, Rep	289,833	6.56	1.30%	63.54%
Switzerland	43,701	6.38	0.20%	63.74%
France	362,076	6.34	1.62%	65.36%
Oman	10,036	6.12	0.04%	65.41%
Bulgaria	54,359	6.08	0.24%	65.65%
Lithuania, Rep	22,006	5.86	0.10%	65.75%
Venezuela	116,424	5.75	0.52%	66.27%
Uzbekistan, Rep	123,253	5.75	0.55%	66.82%
Hungary	59,910	5.72	0.27%	67.09%

Spain	223,196	5.72	1.00%	68.09%
Latvia, Rep	14,781	5.53	0.07%	68.15%
Romania	122,103	5.24	0.55%	68.70%
Portugal	47,181	4.8	0.21%	68.91%
Suriname	2,008	4.58	0.01%	68.92%
Gabon	5,569	4.51	0.02%	68.95%
Mongolia	9,281	4.03	0.04%	68.99%
Lebanon	11,051	3.88	0.05%	69.04%
Iran, Islamic Rep	235,478	3.81	1.05%	70.09%
Mexico	332,852	3.77	1.49%	71.58%
Malaysia	70,492	3.74	0.32%	71.90%
Yugoslavia, Fed Rep	38,197	3.63	0.17%	72.07%
Argentina	117,003	3.52	0.52%	72.59%
Kyrgyz Rep	15,374	3.41	0.07%	72.66%
Bosnia and Herzegovina	15,055	3.37	0.07%	72.73%
Croatia, Rep	16,210	3.33	0.07%	72.80%
Iraq	64,527	3.33	0.29%	73.09%
Moldova, Rep	14,209	3.26	0.06%	73.15%
Jamaica	8,042	3.26	0.04%	73.19%
Syrian Arab Rep	42,407	3.19	0.19%	73.38%
Algeria	79,172	3	0.35%	73.73%
Slovenia, Rep	5,503	2.75	0.02%	73.76%
Cuba	28,623	2.64	0.13%	73.89%
Jordan	11,311	2.64	0.05%	73.94%
Chile	34,738	2.56	0.16%	74.09%
Georgia, Rep	13,839	2.53	0.06%	74.15%
Turkey	145,490	2.49	0.65%	74.80%
China	2,667,982	2.27	11.94%	86.75%
Thailand	112,477	2.02	0.50%	87.25%
Macedonia, former Yug	4,100	1.98	0.02%	87.27%
Colombia	61,493	1.83	0.28%	87.54%
Zimbabwe	18,675	1.76	0.08%	87.63%
Ecuador	18,888	1.72	0.08%	87.71%
Congo	3,972	1.69	0.02%	87.73%
Panama	4,228	1.69	0.02%	87.75%
Botswana	2,173	1.65	0.01%	87.76%
Tunisia	13,560	1.61	0.06%	87.82%
Uruguay	5,038	1.61	0.02%	87.84%
Egypt	83,997	1.54	0.38%	88.22%
Brazil	217,074	1.39	0.97%	89.19%
Mauritania	2,869	1.36	0.01%	89.20%
Dominican Rep	10,248	1.36	0.05%	89.25%
Belize	264	1.32	0.00%	89.25%
Mauritius	1,356	1.25	0.01%	89.26%
Albania	3,968	1.21	0.02%	89.27%
Costa Rica	3,807	1.21	0.02%	89.29%
Armenia	4,199	1.21	0.02%	89.31%
Morocco	27,344	1.03	0.12%	89.43%
Guyana	835	1.03	0.00%	89.44%

Peru	22,277	0.99	0.10%	89.54%
Indonesia	184,585	0.95	0.83%	90.36%
Fiji	711	0.95	0.00%	90.37%
Bolivia	6,632	0.88	0.03%	90.39%
India	769,440	0.88	3.44%	93.84%
Nigeria	96,513	0.84	0.43%	94.27%
Yemen, Rep	10,083	0.81	0.05%	94.32%
Philippines	49,698	0.77	0.22%	94.54%
Tajikistan, Rep	3,972	0.7	0.02%	94.56%
El Salvador	3,550	0.66	0.02%	94.57%
Nicaragua	2,495	0.62	0.01%	94.58%
Guatemala	5,657	0.59	0.03%	94.61%
Paraguay	2,620	0.59	0.01%	94.62%
Pakistan	71,902	0.59	0.32%	94.94%
Honduras	3,059	0.55	0.01%	94.96%
Papua New Guinea	2,257	0.55	0.01%	94.97%
Cote d'Ivoire	6,309	0.48	0.03%	94.99%
Solomon Islands	161	0.48	0.00%	95.00%
Angola	4,525	0.44	0.02%	95.02%
Senegal	2,810	0.37	0.01%	95.03%
Equatorial Guinea	117	0.33	0.00%	95.03%
Swaziland	267	0.33	0.00%	95.03%
Zambia	2,481	0.29	0.01%	95.04%
Sri Lanka	4,972	0.29	0.02%	95.06%
Viet Nam	21,522	0.29	0.10%	95.16%
Gambia, The	198	0.22	0.00%	95.16%
Ghana	3,781	0.22	0.02%	95.18%
Guinea-Bissau	209	0.22	0.00%	95.18%
Kenya	5,342	0.22	0.02%	95.20%
Cameroon	2,231	0.18	0.01%	95.21%
Guinea	1,026	0.18	0.00%	95.22%
Togo	733	0.18	0.00%	95.22%
Niger	1,085	0.15	0.00%	95.23%
Sudan	3,462	0.15	0.02%	95.24%
Bangladesh	17,217	0.15	0.08%	95.32%
Benin	612	0.11	0.00%	95.32%
Liberia	278	0.11	0.00%	95.32%
Sierra Leone	432	0.11	0.00%	95.32%
Zaire	4,181	0.11	0.02%	95.34%
Haiti	784	0.11	0.00%	95.35%
Myanmar	4,386	0.11	0.02%	95.37%
Burkina Faso	557	0.07	0.00%	95.37%
Central African Rep	216	0.07	0.00%	95.37%
Madagascar	945	0.07	0.00%	95.37%
Malawi	652	0.07	0.00%	95.38%
Mozambique	997	0.07	0.00%	95.38%
Rwanda	451	0.07	0.00%	95.38%
Tanzania	2,103	0.07	0.01%	95.39%
Afghanistan, Islamic Sta	1,392	0.07	0.01%	95.40%

Bhutan	132	0.07	0.00%	95.40%
Lao People's Dem Rep	271	0.07	0.00%	95.40%
Nepal	1,297	0.07	0.01%	95.41%
Burundi	191	0.04	0.00%	95.41%
Chad	253	0.04	0.00%	95.41%
Ethiopia	2,906	0.04	0.01%	95.42%
Mali	443	0.04	0.00%	95.42%
Uganda	953	0.04	0.00%	95.43%
Cambodia	476	0.04	0.00%	95.43%
Somalia	15	0	0.00%	95.43%
Eritrea	X	X	#VALUE!	#VALUE!
Lesotho	X	X	#VALUE!	#VALUE!
Namibia	X	X	#VALUE!	#VALUE!

Rank	Country/Region	Total CO2 (000 metric tons)	GDP (PPP) (million Int\$)	Emissions/GDP (tons/000 \$)	% global Emissions	Cumulative Percent
1	Zaire	284181	19049	14.92	1.07%	1.07%
2	Gabon	56569	3943	14.35	0.21%	1.29%
3	Central African Rep	23216	1950	11.91	0.09%	1.38%
4	Bolivia	146632	14288	10.26	0.55%	1.93%
5	Guyana	7735	1135	6.81	0.03%	1.96%
6	Suriname	7108	1102	6.45	0.03%	1.99%
7	Nicaragua	35495	5669	6.26	0.13%	2.12%
8	Zambia	36481	7360	4.96	0.14%	2.26%
9	Lao People's Dem Rep	37271	7592	4.91	0.14%	2.40%
10	Papua New Guinea	37257	7923	4.70	0.14%	2.54%
11	Liberia	9878	2272	4.35	0.04%	2.58%
12	Myanmar	134386	31582	4.26	0.51%	3.09%
13	Korea, Dem People's Re	254450	60990	4.17	0.96%	4.05%
14	Bhutan	4632	1118	4.14	0.02%	4.07%
15	Kazakhstan, Rep	297982	82590	3.61	1.13%	5.19%
16	Paraguay	37620	12116	3.10	0.14%	5.34%
17	Congo	17972	6012	2.99	0.07%	5.40%
18	Guinea	11026	3694	2.98	0.04%	5.45%
19	Angola	20525	6947	2.95	0.08%	5.52%
20	United Arab Emirates	70616	25381	2.78	0.27%	5.79%
21	Turkmenistan, Rep	42257	16556	2.55	0.16%	5.95%
22	Romania	122103	48388	2.52	0.46%	6.41%
23	Chad	7353	2955	2.49	0.03%	6.44%
24	Solomon Islands	1961	789	2.49	0.01%	6.45%
25	Ecuador	90888	36685	2.48	0.34%	6.79%
26	Panama	25228	10208	2.47	0.10%	6.89%
27	Guinea-Bissau	2009	832	2.41	0.01%	6.89%
28	Honduras	22059	9274	2.38	0.08%	6.98%
29	Azerbaijan	63878	27016	2.36	0.24%	7.22%
30	Sudan	41462	18304	2.27	0.16%	7.38%
31	Cameroon	30231	13667	2.21	0.11%	7.49%
32	Madagascar	21945	10148	2.16	0.08%	7.57%
33	Estonia, Rep	20885	9906	2.11	0.08%	7.65%
34	Malaysia	280492	133586	2.10	1.06%	8.71%
35	Jamaica	15242	7273	2.10	0.06%	8.77%
36	Ukraine	611342	296347	2.06	2.31%	11.08%
37	South Africa	304291	150608	2.02	1.15%	12.23%
38	Peru	118277	58791	2.01	0.45%	12.68%
39	Malawi	11652	6092	1.91	0.04%	12.73%
40	Mongolia	9761	5319	1.84	0.04%	12.76%
41	Poland, Rep	341892	187577	1.82	1.29%	14.06%
42	Brazil	1317074	754804	1.74	4.98%	19.04%
43	Trinidad & Tobago	21843	12679	1.72	0.08%	19.12%
44	Russian Federation	2103132	1223573	1.72	7.95%	27.07%
45	Uzbekistan, Rep	123253	72104	1.71	0.47%	27.54%
46	Venezuela	286424	172419	1.66	1.08%	28.62%

47	Belarus, Rep	102028	62594	1.63	0.39%	29.01%
48	Zimbabwe	23975	15419	1.55	0.09%	29.10%
49	Viet Nam	61522	39838	1.54	0.23%	29.33%
50	Saudi Arabia	220680	143679	1.54	0.83%	30.17%
51	Tanzania	24103	15912	1.51	0.09%	30.26%
52	China	2817982	2141180	1.32	10.66%	40.92%
53	Mali	8843	6737	1.31	0.03%	40.95%
54	Botswana	5373	4202	1.28	0.02%	40.97%
55	Cote d'Ivoire	21309	16882	1.26	0.08%	41.05%
56	Mauritania	2870	2282	1.26	0.01%	41.06%
57	Indonesia	594585	478799	1.24	2.25%	43.31%
58	Costa Rica	17807	14403	1.24	0.07%	43.38%
59	Mozambique	15997	13369	1.20	0.06%	43.44%
60	Lithuania, Rep	22006	18637	1.18	0.08%	43.52%
61	Iraq	64551	54787	1.18	0.24%	43.77%
62	Philippines	159698	137734	1.16	0.60%	44.37%
63	Colombia	171493	148368	1.16	0.65%	45.02%
64	Togo	2833	2517	1.13	0.01%	45.03%
65	Ghana	21781	19921	1.09	0.08%	45.11%
66	Belize	1244	1142	1.09	0.00%	45.12%
67	Libya	39596	36531	1.08	0.15%	45.27%
68	Singapore	49790	46213	1.08	0.19%	45.45%
69	Algeria	86072	80271	1.07	0.33%	45.78%
70	Argentina	202003	191699	1.05	0.76%	46.54%
71	Nigeria	120513	115579	1.04	0.46%	47.00%
72	Kyrgyz Rep	15374	14959	1.03	0.06%	47.06%
73	Hungary	59910	59327	1.01	0.23%	47.29%
74	Iran, Islamic Rep	245478	258602	0.95	0.93%	48.21%
75	Guatemala	26657	28135	0.95	0.10%	48.31%
76	Kuwait	15971	17557	0.91	0.06%	48.37%
77	Bulgaria	54359	60299	0.90	0.21%	48.58%
78	Jordan	11408	13241	0.86	0.04%	48.62%
79	Australia	267937	321126	0.83	1.01%	49.64%
80	United States	4881349	5925080	0.82	18.46%	68.10%
81	Norway	60247	73148	0.82	0.23%	68.33%
82	Latvia, Rep	14781	18246	0.81	0.06%	68.38%
83	Greece	73859	91259	0.81	0.28%	68.66%
84	Moldova, Rep	14209	17875	0.79	0.05%	68.72%
85	Chile	67738	85948	0.79	0.26%	68.97%
86	Cuba	31823	43907	0.72	0.12%	69.09%
87	Oman	10036	13975	0.72	0.04%	69.13%
88	Ireland	30851	43187	0.71	0.12%	69.25%
89	Thailand	204477	286533	0.71	0.77%	70.02%
90	Senegal	7510	10601	0.71	0.03%	70.05%
91	Korea, Rep	291333	415320	0.70	1.10%	71.15%
92	Dominican Rep	15048	21555	0.70	0.06%	71.21%
93	Canada	409862	596557	0.69	1.55%	72.76%
94	Syrian Arab Rep	43197	63326	0.68	0.16%	72.92%
95	Germany	878136	1315229	0.67	3.32%	76.24%

96	Egypt	83997	125842	0.67	0.32%	76.56%
97	Israel	41605	64245	0.65	0.16%	76.72%
98	Benin	3812	5948	0.64	0.01%	76.73%
99	Burkina Faso	3957	6183	0.64	0.01%	76.75%
100	Ethiopia	10906	17245	0.63	0.04%	76.79%
101	United Kingdom	566246	941413	0.60	2.14%	78.93%
102	India	834440	1437124	0.58	3.16%	82.09%
103	Mexico	395852	692795	0.57	1.50%	83.58%
104	Georgia, Rep	13839	24388	0.57	0.05%	83.64%
105	Belgium	101768	181190	0.56	0.38%	84.02%
106	Sierra Leone	2232	3984	0.56	0.01%	84.03%
107	Denmark	53897	96579	0.56	0.20%	84.23%
108	Fiji	2111	3973	0.53	0.01%	84.24%
109	Netherlands	139027	263549	0.53	0.53%	84.77%
110	Finland	41176	78627	0.52	0.16%	84.92%
111	Uganda	5953	11504	0.52	0.02%	84.95%
112	Turkey	145490	285592	0.51	0.55%	85.50%
113	Portugal	47181	95107	0.50	0.18%	85.67%
114	New Zealand	26179	53395	0.49	0.10%	85.77%
115	Morocco	32044	70474	0.45	0.12%	85.89%
116	Japan	1093470	2473223	0.44	4.14%	90.03%
117	Tunisia	14200	32192	0.44	0.05%	90.08%
118	Spain	223196	511794	0.44	0.84%	90.93%
119	Italy	407701	954749	0.43	1.54%	92.47%
120	Austria	56572	132669	0.43	0.21%	92.68%
121	Nepal	10297	24586	0.42	0.04%	92.72%
122	Iceland	1777	4253	0.42	0.01%	92.73%
123	Pakistan	85902	214098	0.40	0.32%	93.05%
124	Sweden	56796	158987	0.36	0.21%	93.27%
125	Gambia, The	328	940	0.35	0.00%	93.27%
126	France	362076	1043232	0.35	1.37%	94.64%
127	Yemen, Rep	10083	30305	0.33	0.04%	94.68%
128	El Salvador	4070	12286	0.33	0.02%	94.69%
129	Uruguay	6338	21087	0.30	0.02%	94.72%
130	Switzerland	43701	150960	0.29	0.17%	94.88%
131	Swaziland	637	2259	0.28	0.00%	94.88%
132	Tajikistan, Rep	3972	14475	0.27	0.02%	94.90%
133	Armenia	4199	16477	0.25	0.02%	94.92%
134	Kenya	6742	29024	0.23	0.03%	94.94%
135	Niger	1085	4711	0.23	0.00%	94.95%
136	Sri Lanka	9272	49170	0.19	0.04%	94.98%
137	Haiti	1254	6794	0.18	0.00%	94.99%
138	Mauritius	1365	8672	0.16	0.01%	94.99%
139	Bangladesh	24917	215385	0.12	0.09%	95.08%
140	Rwanda	621	7071	0.09	0.00%	95.09%
141	Burundi	321	4149	0.08	0.00%	95.09%
142	Somalia	445	8849	0.05	0.00%	95.09%
143	Equatorial Guinea	3117	X		0.01%	
144	Eritrea	X	X			

145	Lesotho	X	1942			
146	Namibia	X	4596			
147	Albania	3968	X		0.02%	
148	Bosnia and Herzegovina	15055	X		0.06%	
149	Croatia, Rep	16210	X		0.06%	
150	Czech Rep	135608	X		0.51%	
151	Macedonia, former Yug	4100	X		0.02%	
152	Slovak Rep	36999	X		0.14%	
153	Slovenia, Rep	5503	X		0.02%	
154	Yugoslavia, Fed Rep	38197	X		0.14%	
155	Afghanistan, Islamic Sta	2492	X		0.01%	
156	Cambodia	35476	X		0.13%	
157	Lebanon	11142	X		0.04%	

		Total CO2	CO2 Emissions	PPP	% Global	Cumulative
		(land and emissions)		GDP	Total	Percent
Rank	Country/Region	(000 metric tons)	(000 metric tons)	(million Int\$)		
1	United States	4881349	4,881,349	5,925,080	18.46%	18.46%
2	Japan	1093470	1,093,470	2,473,223	4.14%	22.60%
3	China	2817982	2,667,982	2,141,180	10.66%	33.26%
4	India	834440	769,440	1,437,124	3.16%	36.41%
5	Germany	878136	878,136	1,315,229	3.32%	39.73%
6	Russian Federation	2103132	2,103,132	1,223,573	7.95%	47.69%
7	France	362076	362,076	1,043,232	1.37%	49.06%
8	Italy	407701	407,701	954,749	1.54%	50.60%
9	United Kingdom	566246	566,246	941,413	2.14%	52.74%
10	Brazil	1317074	217,074	754,804	4.98%	57.72%
11	Mexico	395852	332,852	692,795	1.50%	59.22%
12	Canada	409862	409,862	596,557	1.55%	60.77%
13	Spain	223196	223,196	511,794	0.84%	61.61%
14	Indonesia	594585	184,585	478,799	2.25%	63.86%
15	Korea, Rep	291333	289,833	415,320	1.10%	64.97%
16	Australia	267937	267,937	321,126	1.01%	65.98%
17	Ukraine	611342	611,342	296,347	2.31%	68.29%
18	Thailand	204477	112,477	286,533	0.77%	69.06%
19	Turkey	145490	145,490	285,592	0.55%	69.61%
20	Netherlands	139027	139,027	263,549	0.53%	70.14%
21	Iran, Islamic Rep	245478	235,478	258,602	0.93%	71.07%
22	Bangladesh	24917	17,217	215,385	0.09%	71.16%
23	Pakistan	85902	71,902	214,098	0.32%	71.49%
24	Argentina	202003	117,003	191,699	0.76%	72.25%
25	Poland, Rep	341892	341,892	187,577	1.29%	73.55%
26	Belgium	101768	101,768	181,190	0.38%	73.93%
27	Venezuela	286424	116,424	172,419	1.08%	75.01%
28	Sweden	56796	56,796	158,987	0.21%	75.23%
29	Switzerland	43701	43,701	150,960	0.17%	75.39%
30	South Africa	304291	290,291	150,608	1.15%	76.54%
31	Colombia	171493	61,493	148,368	0.65%	77.19%
32	Saudi Arabia	220680	220,620	143,679	0.83%	78.03%
33	Philippines	159698	49,698	137,734	0.60%	78.63%
34	Malaysia	280492	70,492	133,586	1.06%	79.69%
35	Austria	56572	56,572	132,669	0.21%	79.91%
36	Egypt	83997	83,997	125,842	0.32%	80.22%
37	Nigeria	120513	96,513	115,579	0.46%	80.68%
38	Denmark	53897	53,897	96,579	0.20%	80.88%
39	Portugal	47181	47,181	95,107	0.18%	81.06%
40	Greece	73859	73,859	91,259	0.28%	81.34%
41	Chile	67738	34,738	85,948	0.26%	81.60%
42	Kazakhstan, Rep	297982	297,982	82,590	1.13%	82.72%
43	Algeria	86072	79,172	80,271	0.33%	83.05%
44	Finland	41176	41,176	78,627	0.16%	83.21%
45	Norway	60247	60,247	73,148	0.23%	83.43%

46	Uzbekistan, Rep	123253	123,253	72,104	0.47%	83.90%
47	Morocco	32044	27,344	70,474	0.12%	84.02%
48	Israel	41605	41,605	64,245	0.16%	84.18%
49	Syrian Arab Rep	43197	42,407	63,326	0.16%	84.34%
50	Belarus, Rep	102028	102,028	62,594	0.39%	84.73%
51	Korea, Dem People's R	254450	253,750	60,990	0.96%	85.69%
52	Bulgaria	54359	54,359	60,299	0.21%	85.90%
53	Hungary	59910	59,910	59,327	0.23%	86.12%
54	Peru	118277	22,277	58,791	0.45%	86.57%
55	Iraq	64551	64,527	54,787	0.24%	86.81%
56	New Zealand	26179	26,179	53,395	0.10%	86.91%
57	Sri Lanka	9272	4,972	49,170	0.04%	86.95%
58	Romania	122103	122,103	48,388	0.46%	87.41%
59	Singapore	49790	49,790	46,213	0.19%	87.60%
60	Cuba	31823	28,623	43,907	0.12%	87.72%
61	Ireland	30851	30,851	43,187	0.12%	87.84%
62	Viet Nam	61522	21,522	39,838	0.23%	88.07%
63	Ecuador	90888	18,888	36,685	0.34%	88.41%
64	Libya	39596	39,520	36,531	0.15%	88.56%
65	Tunisia	14200	13,560	32,192	0.05%	88.62%
66	Myanmar	134386	4,386	31,582	0.51%	89.12%
67	Yemen, Rep	10083	10,083	30,305	0.04%	89.16%
68	Kenya	6742	5,342	29,024	0.03%	89.19%
69	Guatemala	26657	5,657	28,135	0.10%	89.29%
70	Azerbaijan	63878	63,878	27,016	0.24%	89.53%
71	United Arab Emirates	70616	70,616	25,381	0.27%	89.80%
72	Nepal	10297	1,297	24,586	0.04%	89.84%
73	Georgia, Rep	13839	13,839	24,388	0.05%	89.89%
74	Dominican Rep	15048	10,248	21,555	0.06%	89.94%
75	Uruguay	6338	5,038	21,087	0.02%	89.97%
76	Ghana	21781	3,781	19,921	0.08%	90.05%
77	Zaire	284181	4,181	19,049	1.07%	91.13%
78	Lithuania, Rep	22006	22,006	18,637	0.08%	91.21%
79	Sudan	41462	3,462	18,304	0.16%	91.37%
80	Latvia, Rep	14781	14,781	18,246	0.06%	91.42%
81	Moldova, Rep	14209	14,209	17,875	0.05%	91.48%
82	Kuwait	15971	15,971	17,557	0.06%	91.54%
83	Ethiopia	10906	2,906	17,245	0.04%	91.58%
84	Cote d'Ivoire	21309	6,309	16,882	0.08%	91.66%
85	Turkmenistan, Rep	42257	42,257	16,556	0.16%	91.82%
86	Armenia	4199	4,199	16,477	0.02%	91.83%
87	Tanzania	24103	2,103	15,912	0.09%	91.92%
88	Zimbabwe	23975	18,675	15,419	0.09%	92.02%
89	Kyrgyz Rep	15374	15,374	14,959	0.06%	92.07%
90	Tajikistan, Rep	3972	3,972	14,475	0.02%	92.09%
91	Costa Rica	17807	3,807	14,403	0.07%	92.16%
92	Bolivia	146632	6,632	14,288	0.55%	92.71%
93	Oman	10036	10,036	13,975	0.04%	92.75%
94	Cameroon	30231	2,231	13,667	0.11%	92.86%

95	Mozambique	15997	997	13,369	0.06%	92.92%
96	Jordan	11408	11,311	13,241	0.04%	92.97%
97	Trinidad & Tobago	21843	20,643	12,679	0.08%	93.05%
98	El Salvador	4070	3,550	12,286	0.02%	93.06%
99	Paraguay	37620	2,620	12,116	0.14%	93.21%
100	Uganda	5953	953	11,504	0.02%	93.23%
101	Senegal	7510	2,810	10,601	0.03%	93.26%
102	Panama	25228	4,228	10,208	0.10%	93.35%
103	Madagascar	21945	945	10,148	0.08%	93.44%
104	Estonia, Rep	20885	20,885	9,906	0.08%	93.52%
105	Honduras	22059	3,059	9,274	0.08%	93.60%
106	Somalia	445	15	8,849	0.00%	93.60%
107	Mauritius	1365	1,356	8,672	0.01%	93.61%
108	Papua New Guinea	37257	2,257	7,923	0.14%	93.75%
109	Lao People's Dem Rep	37271	271	7,592	0.14%	93.89%
110	Zambia	36481	2,481	7,360	0.14%	94.03%
111	Jamaica	15242	8,042	7,273	0.06%	94.08%
112	Rwanda	621	451	7,071	0.00%	94.09%
113	Angola	20525	4,525	6,947	0.08%	94.16%
114	Haiti	1254	784	6,794	0.00%	94.17%
115	Mali	8843	443	6,737	0.03%	94.20%
116	Burkina Faso	3957	557	6,183	0.01%	94.22%
117	Malawi	11652	652	6,092	0.04%	94.26%
118	Congo	17972	3,972	6,012	0.07%	94.33%
119	Benin	3812	612	5,948	0.01%	94.34%
120	Nicaragua	35495	2,495	5,669	0.13%	94.48%
121	Mongolia	9761	9,281	5,319	0.04%	94.51%
122	Niger	1085	1,085	4,711	0.00%	94.52%
124	Iceland	1777	1,777	4,253	0.01%	94.52%
125	Botswana	5373	2,173	4,202	0.02%	94.55%
126	Burundi	321	191	4,149	0.00%	94.55%
127	Sierra Leone	2232	432	3,984	0.01%	94.55%
128	Fiji	2111	711	3,973	0.01%	94.56%
129	Gabon	56569	5,569	3,943	0.21%	94.78%
130	Guinea	11026	1,026	3,694	0.04%	94.82%
131	Chad	7353	253	2,955	0.03%	94.85%
132	Togo	2833	733	2,517	0.01%	94.86%
133	Mauritania	2870	2,869	2,282	0.01%	94.87%
134	Liberia	9878	278	2,272	0.04%	94.91%
135	Swaziland	637	267	2,259	0.00%	94.91%
136	Central African Rep	23216	216	1,950	0.09%	95.00%
138	Belize	1244	264	1,142	0.00%	95.00%
139	Guyana	7735	835	1,135	0.03%	95.03%
140	Bhutan	4632	132	1,118	0.02%	95.05%
141	Suriname	7108	2,008	1,102	0.03%	95.07%
142	Gambia, The	328	198	940	0.00%	95.07%
143	Guinea-Bissau	2009	209	832	0.01%	95.08%
144	Solomon Islands	1961	161	789	0.01%	95.09%

	Equatorial Guinea	3117	117	X		
	Eritrea	X	X	X		
	Albania	3968	3,968	X		
	Bosnia and Herzegovin	15055	15,055	X		
	Croatia, Rep	16210	16,210	X		
	Czech Rep	135608	135,608	X		
	Macedonia, former Yu	4100	4,100	X		
	Slovak Rep	36999	36,999	X		
	Slovenia, Rep	5503	5,503	X		
	Yugoslavia, Fed Rep	38197	38,197	X		
	Afghanistan, Islamic St	2492	1,392	X		
	Cambodia	35476	476	X		
	Lebanon	11142	11,051	X		
123	Namibia	X	X	4,596		
137	Lesotho	X	X	1,942		

Country/Region	CO2 Emissions 000 metric tons)	Per Capita CO2 Emission (metric tons)	CO2 Emissions from Land Use (000 metric tons)	Total CO2 (000 metric tons)	GDP PPP (million Int\$)	Per Capita GDP PPP; Intl \$	Avg '83-'93 PPP Growt (%)	1990 Populatio (millions)	1990-1995 Pop Chang (%)	1993 Energ Production (petajoules)	1993 Energy Consumptio (petajoules)	993 per capita Consumption (gigajoules)
WORLD	22,339,408	4.1	4,100,000	26,439,408	X	X	X	5,284,832	1.6	337,518	325,296	59
AFRICA	715,773	X	730,000	1,445,773	X	X	X	632,669	2.8	21,308	8,805	13
Algeria	79,172	3	6,900	86,072	80,271	3,076	1.6	24,935	2.3	4,584	1,183	44
Angola	4,525	0.44	16,000	20,525	6,947	3,076	3.7	9,194	3.7	1,066	26	3
Benin	612	0.11	3,200	3,812	5,948	1,245	1.2	4,633	3.1	13	7	1
Botswana	2,173	1.65	3,200	5,373	4,202	3,406	6.4	1,276	3.1	X	X	X
Burkina Faso	557	0.07	3,400	3,957	6,183	651	3.3	8,987	2.8	X	8	1
Burundi	191	0.04	130	321	4,149	710	4.5	5,503	3.0	1	3	0
Cameroon	2,231	0.18	28,000	30,231	13,667	1,122	-0.4	11,526	2.8	270	36	3
Central African Rep	216	0.07	23,000	23,216	1,950	634	0.8	2,927	2.5	0	3	1
Chad	253	0.04	7,100	7,353	2,955	504	5.3	5,553	2.7	X	1	0
Congo	3,972	1.69	14,000	17,972	6,012	2,538	1.0	2,232	3.0	365	24	10
Cote d'Ivoire	6,309	0.48	15,000	21,309	16,882	1,315	-0.6	11,974	3.5	18	109	8
Egypt	83,997	1.54	X	83,997	125,842	2,274	2.1	56,312	2.2	2,435	1,226	20
Equatorial Guinea	117	0.33	3,000	3,117	X	X	X	352	2.6	0	2	5
Eritrea	X	X	X	X	X	X	X	3,082	2.7	X	X	X
Ethiopia	2,906	0.04	8,000	10,906	17,245	405	0.1	47,423	3.0	7	45	1
Gabon	5,569	4.51	51,000	56,569	3,943	3,983	-0.2	1,146	2.8	637	32	26
Gambia, The	198	0.22	130	328	940	1,019	5.1	923	3.8	X	3	3
Ghana	3,781	0.22	18,000	21,781	19,921	1,249	5.4	15,020	3.0	22	67	4
Guinea	1,026	0.18	10,000	11,026	3,694	604	3.5	5,755	3.0	1	15	2
Guinea-Bissau	209	0.22	1,800	2,009	832	827	2.4	964	2.1	X	3	3
Kenya	5,342	0.22	1,400	6,742	29,024	1,176	4.5	23,613	3.6	21	90	3
Lesotho	X	X	X	X	1,942	1,027	2.5	1,792	2.7	X	X	X
Liberia	278	0.11	9,600	9,878	2,272	1,001	-1.7	2,575	3.3	1	5	2
Libya	39,520	8.1	76	39,596	36,531	9,649	X	4,545	3.5	3,054	457	91
Madagascar	945	0.07	21,000	21,945	10,148	757	0.5	12,571	3.2	1	15	1
Malawi	652	0.07	11,000	11,652	6,092	607	5.1	9,367	3.5	3	11	1
Mali	443	0.04	8,400	8,843	6,737	708	3.2	9,212	3.2	1	7	1
Mauritania	2,869	1.36	1	2,870	2,282	1,083	1.5	2,003	2.5	0	39	18
Mauritius	1,356	1.25	9	1,365	8,672	8,025	6.6	1,057	1.1	0	21	19
Morocco	27,344	1.03	4,700	32,044	70,474	2,777	4.1	24,334	2.1	21	297	11
Mozambique	997	0.07	15,000	15,997	13,369	898	-0.2	14,187	2.4	1	14	1
Namibia	X	X	1,800	X	4,596	3,231	2.8	1,349	2.7	X	X	X
Niger	1,085	0.15	X	1,085	4,711	629	-0.5	7,731	3.4	5	15	2
Nigeria	96,513	0.84	24,000	120,513	115,579	1,132	1.2	96,154	3.0	4,140	705	7
Rwanda	451	0.07	170	621	7,071	961	2.1	6,986	2.6	1	7	1
Senegal	2,810	0.37	4,700	7,510	10,601	1,411	2.4	7,327	2.5	X	38	5
Sierra Leone	432	0.11	1,800	2,232	3,984	914	0.0	3,999	2.4	X	6	1
Somalia	15	0	430	445	8,849	1,040	2.8	8,677	1.3	X	X	X
South Africa	290,291	7.29	14,000	304,291	150,608	3,885	1.4	37,066	2.2	4,146	3,578	79

Sheet1

Sudan	3,462	0.15	38,000	41,462	18,304	725	0.9	24,585	2.7	3	48	2
Swaziland	267	0.33	370	637	2,259	2,950	4.1	744	2.8	X	X	X
Tanzania	2,103	0.07	22,000	24,103	15,912	663	8.2	25,600	3.0	2	30	1
Togo	733	0.18	2,100	2,833	2,517	669	2.4	3,531	3.2	0	9	2
Tunisia	13,560	1.61	640	14,200	32,192	3,807	3.7	8,080	1.9	209	218	25
Uganda	953	0.04	5,000	5,953	11,504	654	-1.2	17,949	3.4	3	16	1
Zaire	4,181	0.11	280,000	284,181	19,049	526	2.6	37,436	3.2	78	73	2
Zambia	2,481	0.29	34,000	36,481	7,360	877	1.0	8,150	3.0	38	51	6
Zimbabwe	18,675	1.76	5,300	23,975	15,419	1,479	2.3	9,903	2.6	160	208	19
EUROPE	6,866,494	X	11,000	6,877,494	X	X	X	721,734	0.2	92,937	108,523	148
Albania	3,968	1.21	X	3,968	X	X	X	3,289	0.9	44	43	13
Austria	56,572	7.29	X	56,572	132,669	16,989	2.7	7,705	0.7	263	966	123
Belarus, Rep	102,028	9.89	X	102,028	62,594	6,130	X	10,212	-0.1	122	1,249	123
Belgium	101,768	10.19	X	101,768	181,190	18,091	2.8	9,951	0.3	470	1,976	197
Bosnia and Herzegovina	15,055	3.37	X	15,055	X	X	X	4,308	-4.4	14	29	8
Bulgaria	54,359	6.08	X	54,359	60,299	6,774	2.5	8,991	-0.5	376	965	109
Croatia, Rep	16,210	3.33	X	16,210	X	X	X	4,517	-0.1	179	263	58
Czech Rep	135,608	13.04	X	135,608	X	X	1.3	10,306	0.0	1,439	1,659	161
Denmark	53,897	10.44	X	53,897	96,579	18,730	1.8	5,140	0.2	525	762	148
Estonia, Rep	20,885	13.19	X	20,885	9,906	6,326	X	1,575	-0.6	121	214	138
Finland	41,176	8.21	X	41,176	78,627	15,619	1.7	4,986	0.5	324	1,014	200
France	362,076	6.34	X	362,076	1,043,232	18,232	2.5	56,718	0.4	4,746	9,153	159
Germany	878,136	10.96	X	878,136	1,315,229	20,197	X	79,365	0.6	6,178	13,724	170
Greece	73,859	7.25	X	73,859	91,259	8,877	2.4	10,238	0.4	352	989	95
Hungary	59,910	5.72	X	59,910	59,327	5,780	-1.1	10,365	-0.5	533	990	97
Iceland	1,777	6.85	X	1,777	4,253	16,324	2.4	255	1.1	25	54	205
Ireland	30,851	8.87	X	30,851	43,187	12,259	4.0	3,503	0.3	152	428	121
Italy	407,701	7.03	X	407,701	954,749	16,724	2.6	57,023	0.1	1,226	6,749	118
Latvia, Rep	14,781	5.53	X	14,781	18,246	6,891	X	2,671	-0.9	14	187	72
Lithuania, Rep	22,006	5.86	X	22,006	18,637	5,025	X	3,711	-0.1	138	368	99
Macedonia, former Yugosl	4,100	1.98	X	4,100	X	X	X	2,046	1.1	86	139	66
Moldova, Rep	14,209	3.26	X	14,209	17,875	4,085	X	4,362	0.3	1	234	53
Netherlands	139,027	9.16	X	139,027	263,549	17,373	2.8	14,952	0.7	3,112	3,306	216
Norway	60,247	14.03	X	60,247	73,148	17,094	2.1	4,241	0.5	6,365	904	210
Poland, Rep	341,892	8.9	X	341,892	187,577	4,907	0.1	38,119	0.1	3,878	4,056	106
Portugal	47,181	4.8	X	47,181	95,107	9,638	5.6	9,868	-0.1	35	603	61
Romania	122,103	5.24	X	122,103	48,388	2,130	2.9	23,207	-0.3	1,345	1,762	77
Russian Federation	2,103,132	14.11	X	2,103,132	1,223,573	8,320	X	147,913	-0.1	43,550	30,042	203
Slovak Rep	36,999	7	X	36,999	X	X	X	5,256	0.4	186	672	126
Slovenia, Rep	5,503	2.75	X	5,503	X	X	X	1,918	0.3	86	194	100
Spain	223,196	5.72	X	223,196	511,794	12,986	4.2	39,272	0.2	1,204	3,359	85
Sweden	56,796	6.56	X	56,796	158,987	18,387	1.7	8,559	0.5	950	1,660	191
Switzerland	43,701	6.38	X	43,701	150,960	21,631	2.5	6,834	1.1	386	985	139
Ukraine	611,342	11.72	X	611,342	296,347	5,768	X	51,637	-0.1	4,501	8,058	156
United Kingdom	566,246	9.78	X	566,246	941,413	16,302	2.7	57,411	0.3	9,663	9,518	164
Yugoslavia, Fed Rep	38,197	3.63	X	38,197	X	X	-1.3	10,156	1.3	347	381	36

N. & C. AMERICA	5,715,466	X	190,000	5,905,466	X	X	X	423,658	1.4	87,427	97,154	220
Belize	264	1.32	980	1,244	1,142	5,739	6.4	189	2.6	X	4	20
Canada	409,862	14.99	X	409,862	596,557	20,970	3.0	27,791	1.2	13,195	9,198	319
Costa Rica	3,807	1.21	14,000	17,807	14,403	4,522	4.2	3,035	2.4	14	63	19
Cuba	28,623	2.64	3,200	31,823	43,907	4,266	X	10,598	0.8	43	369	34
Dominican Rep	10,248	1.36	4,800	15,048	21,555	2,918	2.3	7,110	1.9	6	148	20
El Salvador	3,550	0.66	520	4,070	12,286	2,274	2.2	5,172	2.2	21	72	13
Guatemala	5,657	0.59	21,000	26,657	28,135	2,888	3.0	9,197	2.9	22	72	7
Haiti	784	0.11	470	1,254	6,794	1,069	0.3	6,486	2.0	1	9	1
Honduras	3,059	0.55	19,000	22,059	9,274	1,792	3.1	4,879	3.0	8	43	8
Jamaica	8,042	3.26	7,200	15,242	7,273	3,053	1.8	2,366	0.7	0	104	43
Mexico	332,852	3.77	63,000	395,852	692,795	7,867	3.6	84,511	2.1	8,067	4,941	55
Nicaragua	2,495	0.62	33,000	35,495	5,669	1,542	-3.6	3,676	3.7	20	52	13
Panama	4,228	1.69	21,000	25,228	10,208	4,102	0.2	2,398	1.9	8	61	24
Trinidad & Tobago	20,643	16.3	1,200	21,843	12,679	10,145	-1.6	1,236	1.1	470	267	209
United States	4,881,349	19.13	X	4,881,349	5,925,080	23,220	2.6	249,924	1.0	65,547	81,751	317
SOUTH AMERICA	605,029	X	1,800,000	2,405,029	X	X	X	293,131	1.7	15,355	10,095	33
Argentina	117,003	3.52	85,000	202,003	191,699	5,921	-0.9	32,547	1.2	2,411	2,019	60
Bolivia	6,632	0.88	140,000	146,632	14,288	2,066	1.5	6,573	2.4	164	86	12
Brazil	217,074	1.39	1,100,000	1,317,074	754,804	4,912	2.3	148,477	1.7	2,491	3,800	24
Chile	34,738	2.56	33,000	67,738	85,948	6,326	6.3	13,154	1.6	222	539	39
Colombia	61,493	1.83	110,000	171,493	148,368	4,254	4.0	32,300	1.7	1,812	829	24
Ecuador	18,888	1.72	72,000	90,888	36,685	3,420	1.9	10,264	2.2	784	245	22
Guyana	835	1.03	6,900	7,735	1,135	1,426	-1.7	796	0.9	0	15	18
Paraguay	2,620	0.59	35,000	37,620	12,116	2,655	3.4	4,317	2.8	113	51	11
Peru	22,277	0.99	96,000	118,277	58,791	2,620	-0.7	21,588	1.9	325	314	14
Suriname	2,008	4.58	5,100	7,108	1,102	2,787	-4.3	400	1.1	15	24	58
Uruguay	5,038	1.61	1,300	6,338	21,087	6,736	3.3	3,094	0.6	26	77	24
Venezuela	116,424	5.75	170,000	286,424	172,419	8,449	2.9	19,502	2.3	6,990	2,083	100
ASIA	7,118,317	X	1,300,000	8,418,317	X	X	X	3,186,446	1.6	113,332	95,679	28
Afghanistan, Islamic State	1,392	0.07	1,100	2,492	X	X	X	15,045	5.8	9	22	1
Armenia	4,199	1.21	X	4,199	16,477	4,750	0.0	3,352	1.4	11	49	14
Azerbaijan	63,878	8.76	X	63,878	27,016	4,257	X	7,117	1.2	714	546	74
Bangladesh	17,217	0.15	7,700	24,917	215,385	1,908	5.5	108,118	2.2	217	313	3
Bhutan	132	0.07	4,500	4,632	1,118	870	X	1,544	1.2	6	2	1
Cambodia	476	0.04	35,000	35,476	X	X	X	28,841	3.0	0	7	1
China	2,667,982	2.27	150,000	2,817,982	2,141,180	1,838	4.7	1,155,305	1.1	31,359	29,679	25
Georgia, Rep	13,839	2.53	X	13,839	24,388	4,495	X	5,418	0.1	28	159	29
India	769,440	0.88	65,000	834,440	1,437,124	1,633	5.2	850,638	1.9	8,088	9,338	10
Indonesia	184,585	0.95	410,000	594,585	478,799	2,601	5.0	182,812	1.6	7,145	2,658	14
Iran, Islamic Rep	235,478	3.81	10,000	245,478	258,602	4,161	1.7	58,946	2.7	8,448	3,264	51
Iraq	64,527	3.33	24	64,551	54,787	3,347	-9.0	18,078	2.5	1,476	933	48
Israel	41,605	8.1	X	41,605	64,245	12,783	4.2	4,660	3.8	1	505	96
Japan	1,093,470	8.79	X	1,093,470	2,473,223	19,920	4.3	123,537	0.3	3,466	17,505	141
Jordan	11,311	2.64	97	11,408	13,241	4,039	1.1	4,259	4.9	0	147	30
Kazakhstan, Rep	297,982	17.48	X	297,982	82,590	4,929	X	16,670	0.5	4,025	3,381	199

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Rank	Country/Region	Per Capita Gross Domestic Product (PPP; Intl \$)	Total CO2 (000 metric tons)	% Global Emissions	Cumulative Percent
1	United States	23,220	4,881,349	18.46%	18.46%
2	Switzerland	21,631	43,701	0.17%	18.63%
3	Canada	20,970	409,862	1.55%	20.18%
4	Germany	20,197	878,136	3.32%	23.50%
5	Japan	19,920	1,093,470	4.14%	27.63%
6	Denmark	18,730	53,897	0.20%	27.84%
7	Australia	18,500	267,937	1.01%	28.85%
8	Sweden	18,387	56,796	0.21%	29.07%
9	France	18,232	362,076	1.37%	30.44%
10	Belgium	18,091	101,768	0.38%	30.82%
11	Netherlands	17,373	139,027	0.53%	31.35%
12	Norway	17,094	60,247	0.23%	31.58%
13	Austria	16,989	56,572	0.21%	31.79%
14	Singapore	16,736	49,790	0.19%	31.98%
15	Italy	16,724	407,701	1.54%	33.52%
16	Iceland	16,324	1,777	0.01%	33.53%
17	United Kingdom	16,302	566,246	2.14%	35.67%
18	United Arab Emirate	15,784	70,616	0.27%	35.93%
19	Finland	15,619	41,176	0.16%	36.09%
20	New Zealand	15,502	26,179	0.10%	36.19%
21	Spain	12,986	223,196	0.84%	37.03%
22	Israel	12,783	41,605	0.16%	37.19%
23	Ireland	12,259	30,851	0.12%	37.31%
24	Trinidad and Tobago	10,145	21,843	0.08%	37.39%
25	Libya	9,649	39,596	0.15%	37.54%
26	Portugal	9,638	47,181	0.18%	37.72%
27	Korea, Rep	9,565	291,333	1.10%	38.82%
28	Saudi Arabia	9,390	220,680	0.83%	39.66%
29	Greece	8,877	73,859	0.28%	39.93%
30	Oman	8,650	10,036	0.04%	39.97%
31	Kuwait	8,561	15,971	0.06%	40.03%
32	Venezuela	8,449	286,424	1.08%	41.12%
33	Russian Federation	8,320	2,103,132	7.95%	49.07%
34	Mauritius	8,025	1,365	0.01%	49.08%
35	Mexico	7,867	395,852	1.50%	50.57%
36	Malaysia	7,191	280,492	1.06%	51.63%
37	Latvia, Rep	6,891	14,781	0.06%	51.69%
38	Bulgaria	6,774	54,359	0.21%	51.90%
39	Uruguay	6,736	6,338	0.02%	51.92%
40	Estonia, Rep	6,326	20,885	0.08%	52.00%
41	Chile	6,326	67,738	0.26%	52.25%
42	Belarus, Rep	6,130	102,028	0.39%	52.64%
43	Argentina	5,921	202,003	0.76%	53.40%
44	Hungary	5,780	59,910	0.23%	53.63%
45	Ukraine	5,768	611,342	2.31%	55.94%

46	Belize	5,739	1,244	0.00%	55.95%
47	Fiji	5,288	2,111	0.01%	55.96%
48	Lithuania, Rep	5,025	22,006	0.08%	56.04%
49	Thailand	5,018	204,477	0.77%	56.81%
50	Syrian Arab Rep	4,955	43,197	0.16%	56.98%
51	Kazakhstan, Rep	4,929	297,982	1.13%	58.10%
52	Brazil	4,912	1,317,074	4.98%	63.08%
53	Poland, Rep	4,907	341,892	1.29%	64.38%
54	Turkey	4,893	145,490	0.55%	64.93%
55	Armenia	4,750	4,199	0.02%	64.94%
56	Turkmenistan, Rep	4,527	42,257	0.16%	65.10%
57	Costa Rica	4,522	17,807	0.07%	65.17%
58	Georgia, Rep	4,495	13,839	0.05%	65.22%
59	Cuba	4,266	31,823	0.12%	65.34%
60	Azerbaijan	4,257	63,878	0.24%	65.59%
61	Colombia	4,254	171,493	0.65%	66.23%
62	Iran, Islamic Rep	4,161	245,478	0.93%	67.16%
63	Panama	4,102	25,228	0.10%	67.26%
64	Moldova, Rep	4,085	14,209	0.05%	67.31%
65	Jordan	4,039	11,408	0.04%	67.35%
66	Gabon	3,983	56,569	0.21%	67.57%
67	South Africa	3,885	304,291	1.15%	68.72%
68	Tunisia	3,807	14,200	0.05%	68.77%
69	Ecuador	3,420	90,888	0.34%	69.12%
70	Botswana	3,406	5,373	0.02%	69.14%
71	Kyrgyz Rep	3,372	15,374	0.06%	69.20%
72	Iraq	3,347	64,551	0.24%	69.44%
73	Uzbekistan, Rep	3,344	123,253	0.47%	69.91%
74	Algeria	3,076	86,072	0.33%	70.23%
75	Angola	3,076	20,525	0.08%	70.31%
76	Korea, Dem People's	3,067	254,450	0.96%	71.27%
77	Jamaica	3,053	15,242	0.06%	71.33%
78	Swaziland	2,950	637	0.00%	71.33%
79	Dominican Rep	2,918	15,048	0.06%	71.39%
80	Guatemala	2,888	26,657	0.10%	71.49%
81	Suriname	2,787	7,108	0.03%	71.52%
82	Sri Lanka	2,783	9,272	0.04%	71.55%
83	Tajikistan, Rep	2,783	3,972	0.02%	71.57%
84	Morocco	2,777	32,044	0.12%	71.69%
85	Yemen, Rep	2,769	10,083	0.04%	71.73%
86	Paraguay	2,655	37,620	0.14%	71.87%
87	Solomon Islands	2,639	1,961	0.01%	71.88%
88	Peru	2,620	118,277	0.45%	72.32%
89	Indonesia	2,601	594,585	2.25%	74.57%
90	Congo	2,538	17,972	0.07%	74.64%
91	Mongolia	2,443	9,761	0.04%	74.68%
92	Egypt	2,274	83,997	0.32%	74.99%
93	El Salvador	2,274	4,070	0.02%	75.01%
94	Philippines	2,172	159,698	0.60%	75.61%

95	Romania	2,130	122,103	0.46%	76.08%
96	Bolivia	2,066	146,632	0.55%	76.63%
97	Papua New Guinea	1,972	37,257	0.14%	76.77%
98	Bangladesh	1,908	24,917	0.09%	76.87%
99	China	1,838	2,817,982	10.66%	87.52%
100	Pakistan	1,793	85,902	0.32%	87.85%
101	Honduras	1,792	22,059	0.08%	87.93%
102	Lao People's Dem R	1,753	37,271	0.14%	88.07%
103	India	1,633	834,440	3.16%	91.23%
104	Nicaragua	1,542	35,495	0.13%	91.36%
105	Zimbabwe	1,479	23,975	0.09%	91.45%
106	Guyana	1,426	7,735	0.03%	91.48%
107	Senegal	1,411	7,510	0.03%	91.51%
108	Cote d'Ivoire	1,315	21,309	0.08%	91.59%
109	Ghana	1,249	21,781	0.08%	91.67%
110	Benin	1,245	3,812	0.01%	91.69%
111	Nepal	1,240	10,297	0.04%	91.73%
112	Kenya	1,176	6,742	0.03%	91.75%
113	Nigeria	1,132	120,513	0.46%	92.21%
114	Cameroon	1,122	30,231	0.11%	92.32%
115	Mauritania	1,083	2,870	0.01%	92.33%
116	Haiti	1,069	1,254	0.00%	92.34%
117	Somalia	1,040	445	0.00%	92.34%
118	Gambia, The	1,019	328	0.00%	92.34%
119	Liberia	1,001	9,878	0.04%	92.38%
120	Rwanda	961	621	0.00%	92.38%
121	Sierra Leone	914	2,232	0.01%	92.39%
122	Mozambique	898	15,997	0.06%	92.45%
123	Zambia	877	36,481	0.14%	92.59%
124	Bhutan	870	4,632	0.02%	92.61%
125	Guinea-Bissau	827	2,009	0.01%	92.61%
126	Myanmar	772	134,386	0.51%	93.12%
127	Madagascar	757	21,945	0.08%	93.20%
128	Sudan	725	41,462	0.16%	93.36%
129	Burundi	710	321	0.00%	93.36%
130	Mali	708	8,843	0.03%	93.40%
131	Togo	669	2,833	0.01%	93.41%
132	Viet Nam	665	61,522	0.23%	93.64%
133	Tanzania	663	24,103	0.09%	93.73%
134	Uganda	654	5,953	0.02%	93.75%
135	Burkina Faso	651	3,957	0.01%	93.77%
136	Central African Rep	634	23,216	0.09%	93.86%
137	Niger	629	1,085	0.00%	93.86%
138	Malawi	607	11,652	0.04%	93.90%
139	Guinea	604	11,026	0.04%	93.95%
140	Zaire	526	284,181	1.07%	95.02%
141	Chad	504	7,353	0.03%	95.05%
142	Ethiopia	405	10,906	0.04%	95.09%
143	Equatorial Guinea	X	3,117	0.01%	95.10%

144	Albania	X	3,968	0.02%	95.12%
145	Bosnia and Herzegov	X	15,055	0.06%	95.17%
146	Croatia, Rep	X	16,210	0.06%	95.23%
147	Czech Rep	X	135,608	0.51%	95.75%
148	Macedonia, former Y	X	4,100	0.02%	95.76%
149	Slovak Rep	X	36,999	0.14%	95.90%
150	Slovenia, Rep	X	5,503	0.02%	95.92%
151	Yugoslavia, Fed Rep	X	38,197	0.14%	96.07%
152	Afghanistan, Islamic	X	2,492	0.01%	96.08%
153	Cambodia	X	35,476	0.13%	96.21%
154	Lebanon	X	11,142	0.04%	96.25%
155	Namibia	3,231 X			
156	Lesotho	1,027 X			
157	Eritrea	X X			