

**Outline of DNE21+ Model
- Population, GDP Estimates-**

March 25, 2008

1. Population

- Statistics from United Nations 2006 are used. (UN, World Population Prospects: The 2006 Revision. <http://esa.un.org/unpp/>) (Figure 1)
- The global population is assumed to be 8.3 billion in 2030 and 9.2 billion in 2050.

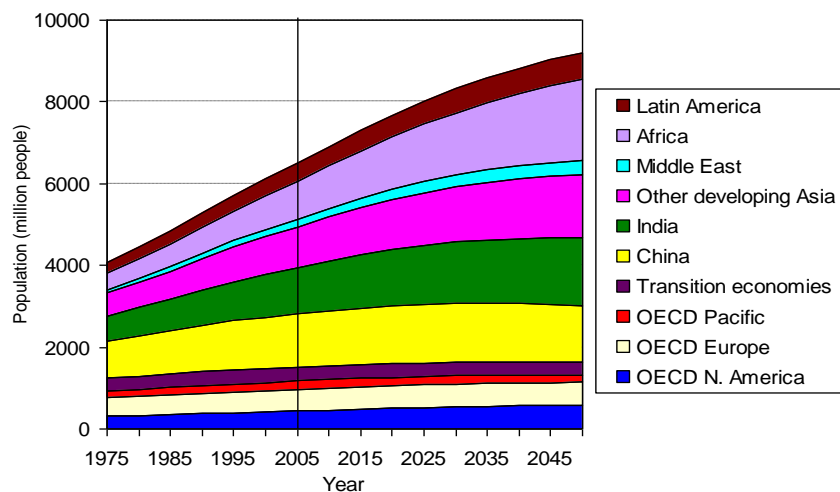


Fig.1 Population projections

2. GDP

- Actual figures were used to 2005 (IEA, Energy Balances of OECD/Non-OECD Countries, 2007. However this is based on WB, World Development Indicator)
- World Bank statistics for 2007 estimate GDP growth rate until 2030 for 9 regions (WB, Global Economic Prospects 2007—Managing the Next Wave of Globalization, 2006 http://www-wds.worldbank.org/external/default/main?pagePK=64193027&piPK=64187937&theSitePK=523679&menuPK=64187510&searchMenuPK=64187283&theSitePK=523679&entityID=000112742_20061206155022&searchMenuPK=64187283&theSitePK=523679). The distribution in the 9 regions is adjusted with respect to historical results in order to correspond with the World Bank statistics from 2007 for GDP growth rates in 9 regions. Then United Nations estimates 2006 are used to convert to an initial per capita GDP growth rate.

- Up to 2050, GDP growth rates for four regions in the IPCC SRES B2 scenario (OECD90, former Soviet Union and Eastern Europe, Asia, Other) were used and then are converted to an initial per capita GDP growth rate.
- The per capita GDP results for 2005 and the per capita GDP growth rate above are used to estimate per capita GDP to 2030 in the WB base and to 2050 in the IPCC SRES B2 base.
- This is combined with the population scenarios (UN 2006 Estimates) in order to estimate GDP for each country (each region). (Figure 2)
- The worldwide per capita GDP growth rate is 2.07%/yr for 2008-2015, 1.96%/yr for 2008-2030 and 1.90%/yr for 2008-2050.
- Global real GDP growth rate is 3.19%/yr for 2008-2015, 2.91%/yr for 2008-2030 and 2.64%/yr for 2008-2050.
- Japan's real GDP growth rate is 2.30%/yr for 2008-2015, 2.01%/yr for 2008-2030 and 1.33%/yr for 2008-2050.

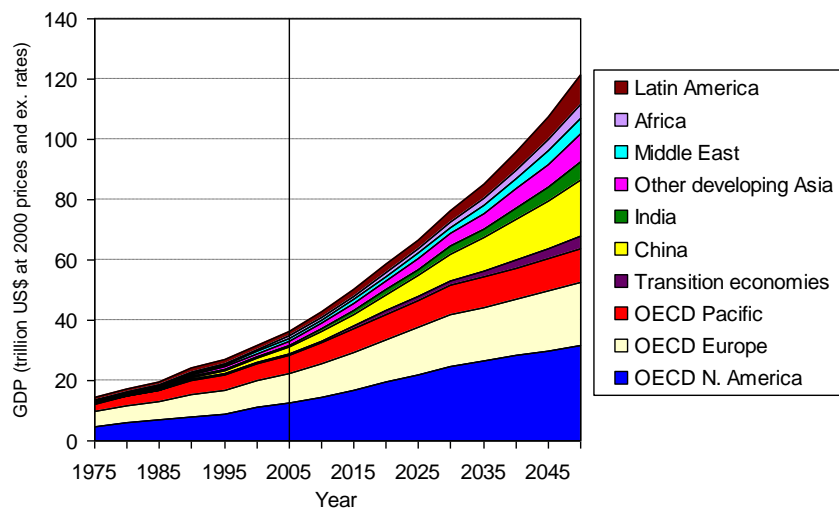


Fig.2 GDP projections

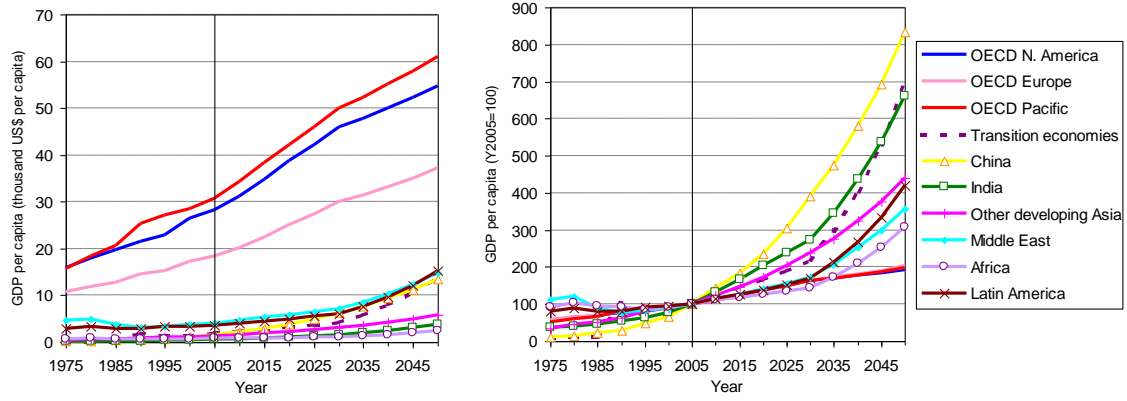


Fig.3 Per capita GDP projections

Table 1 Population projections (billion people)

		2000	2005	2010	2020	2030	2040	2050
0	United States	289.0	304.1	319.0	347.1	370.9	390.6	407.2
1	Canada	30.7	32.3	33.8	36.6	39.1	41.1	42.8
2	United Kingdom	59.2	60.6	61.9	64.4	66.5	68.0	69.1
3	France	59.6	61.4	62.9	65.3	67.0	68.2	68.7
4	Germany	82.3	82.7	82.4	81.2	79.3	76.9	74.1
5	Italy	57.7	58.7	59.1	58.6	57.6	56.3	54.6
6	Spain, Portugal	50.5	53.9	55.8	57.2	57.3	57.1	56.4
7	Belgium, Netherlands, Denmark	31.5	32.2	32.5	33.0	33.6	33.7	33.5
8	North Europe	14.0	14.3	14.6	15.1	15.5	15.7	15.8
9	Other EU	23.3	24.0	24.7	25.4	25.9	26.2	26.2
10	Norway, Iceland	4.8	4.9	5.1	5.4	5.7	5.9	6.1
11	Greenland (Denmark)	0.1	0.1	0.1	0.1	0.1	0.1	0.1
12	Other Western Europe	7.8	8.0	8.1	8.4	8.7	8.9	9.0
13	Japan	127.0	127.9	127.8	124.5	118.3	110.7	102.5
14	Australia	19.1	20.3	21.4	23.4	25.3	26.8	28.0
15	New Zealand	3.9	4.1	4.3	4.6	4.9	5.1	5.2
16	Other Oceania	8.0	8.8	9.7	11.2	12.8	14.2	15.3
17	China	1254.8	1297.1	1335.2	1404.4	1441.0	1431.4	1392.4
18	North Korea, Mongolia	25.4	26.2	26.7	27.8	28.6	28.6	28.1
19	Viet Nam, Cambodia, Laos	97.1	104.6	112.2	127.0	139.3	148.6	154.4
20	Korea	46.8	47.9	48.7	49.2	48.4	46.0	42.3
21	Malaysia, Singapore	27.3	30.0	32.5	37.0	40.5	43.0	44.7
22	Indonesia	212.5	227.1	240.9	263.6	282.0	294.9	300.3
23	Thailand	60.7	63.0	65.1	68.0	69.2	68.9	67.4
24	Philippines	76.2	84.6	93.0	108.7	122.4	132.9	140.5
25	Brunei	0.3	0.4	0.4	0.5	0.6	0.6	0.7
26	Chinese Taipei	22.2	23.4	24.2	25.5	26.5	26.4	26.0
27	India	1046.2	1134.4	1220.2	1379.2	1505.7	1596.7	1658.3
28	Pakistan, Afghanistan	165.1	183.1	203.7	249.3	293.5	334.9	371.6
29	Myanmar	45.9	48.0	50.1	53.8	56.7	58.3	58.7
30	Other Asia	183.4	200.4	217.1	250.6	281.2	306.8	326.1
31	Iran	66.1	69.4	74.3	84.2	91.2	96.7	100.2
32	Saudi Arabia	20.8	23.6	26.4	32.1	37.3	41.6	45.0

33	Bahrain, Oman, Qatar, UAE, Yemen	25.1	29.2	33.7	43.5	5.3.6	63.8	73.7
34	Other Middle East	62.4	70.4	78.4	95.6	112.0	126.7	139.4
35	Turkey	68.2	73.0	77.7	86.1	92.5	96.8	98.9
36	North Africa	140.8	152.2	164.5	188.8	209.0	224.9	236.3
37	South Africa	45.4	47.9	49.3	51.3	53.2	54.6	55.6
38	South East Africa	270.5	307.9	350.2	442.7	539.0	635.7	727.7
39	Other S.S.Africa	364.3	413.9	468.0	587.7	717.0	850.1	978.4
40	Mexico	99.7	104.3	110.3	120.6	128.1	132.2	132.3
41	Other Central America	70.1	75.5	81.0	92.4	102.4	110.1	115.2
42	Brazil	174.2	186.8	199.0	220.0	236.5	247.8	254.1
43	Venezuela, Guyana, Suriname	25.7	28.1	30.3	34.9	38.6	41.5	43.4
44	Paraguay, Uruguay, Argentina	45.6	48.0	50.6	55.5	59.6	62.7	64.9
45	Other South America	103.4	110.8	117.7	131.4	142.6	150.3	154.5
46	Russia	147.4	144.0	140.3	132.4	123.9	115.8	117.8
47	Other Annex I of FUSSR	56.1	54.0	52.1	48.3	44.3	40.4	36.5
48	Belarus	10.1	9.8	9.5	9.0	8.3	7.7	7.0
49	Kazakhstan	15.0	15.2	15.8	16.7	17.1	17.4	17.3
50	Other FUSSR	56.3	59.0	62.3	69.0	73.5	76.3	77.5
51	OECD E.Europe	58.9	58.5	58.0	56.7	54.3	51.1	47.5
52	Other Annex I of East Europe	42.0	41.3	40.5	38.7	36.4	33.8	30.9
53	Other E.Europe	23.8	23.5	23.5	23.5	23.1	22.4	21.5
	World Total	6124.1	6514.8	6906.6	7667.1	8317.7	8823.5	9191.3

Table 2 GDP projections (billion US\$ at 2000 prices, MER)

		2000	2005	2010	2020	2030	2040	2050
0	United States	9764.8	10995.8	12725.7	17227.2	21838.4	24422.5	26977.0
1	Canada	724.9	822.4	948.8	1279.7	1622.6	1809.5	1996.3
2	United Kingdom	1442.2	1626.8	1828.8	2368.5	2903.3	3148.6	3392.1
3	France	1324.3	1425.7	1608.4	2075.1	2528.9	2733.2	2914.3
4	Germany	1900.2	1961.8	2152.2	2638.8	3060.7	3147.8	3215.8
5	Italy	1097.3	1132.8	1255.4	1550.6	1805.7	1876.0	1929.2
6	Spain, Portugal	692.4	796.0	908.2	1159.7	1378.6	1461.4	1530.7
7	Belgium, Netherlands, Denmark	775.4	826.6	920.1	1162.1	1400.9	1493.2	1570.7
8	North Europe	363.9	409.7	460.0	593.2	722.9	777.1	834.0
9	Other EU	456.4	536.4	610.9	791.5	965.1	1044.2	1118.3
10	Norway, Iceland	175.5	195.4	222.0	293.3	367.4	405.1	440.8
11	Greenland (Denmark)	1.6	1.8	2.0	2.7	3.2	3.4	3.6
12	Other Western Europe	251.4	265.2	297.6	383.6	470.3	509.9	550.1
13	Japan	4649.6	4994.1	5599.1	6764.5	7692.8	7643.6	7504.2
14	Australia	399.6	469.8	549.9	750.0	973.9	1096.7	1218.7
15	New Zealand	52.7	62.7	73.0	97.8	124.7	137.9	149.8
16	Other Oceania	5.3	6.1	9.2	16.8	30.1	49.1	76.7
17	China	1367.2	2097.9	3088.1	5367.3	9109.1	13420.7	18787.6
18	North Korea, Mongolia	11.8	11.8	16.6	27.2	43.9	64.7	92.4
19	Viet Nam, Cambodia, Laos	38.3	54.3	80.7	143.2	246.3	387.0	583.9
20	Korea	511.7	637.9	721.8	908.2	1074.1	1504.7	2015.0
21	Malaysia, Singapore	183.0	224.7	315.1	535.9	882.1	1327.8	1927.2
22	Indonesia	165.6	208.5	274.0	419.5	704.1	1086.6	1609.0
23	Thailand	122.7	157.1	193.5	265.4	424.0	623.1	885.4
24	Philippines	75.4	93.7	142.9	262.2	463.2	741.9	1140.5
25	Brunei	4.3	4.8	6.5	11.4	19.1	31.4	49.7
26	Chinese Taipei	307.9	355.5	449.5	692.6	865.8	927.0	983.2
27	India	460.2	644.1	920.5	1609.7	2346.7	3968.9	6240.3
28	Pakistan, Afghanistan	87.1	110.0	149.7	234.3	353.4	598.0	969.6
29	Myanmar	9.8	15.2	20.1	28.4	39.4	59.9	87.6
30	Other Asia	69.5	88.0	116.1	169.7	241.1	382.2	582.8
31	Iran	101.3	132.6	165.8	231.2	307.5	480.6	707.0
32	Saudi Arabia	188.4	229.1	292.9	437.0	624.3	1025.0	1576.4

33	Bahrain, Oman, Qatar, UAE, Yemen	125.7	172.3	223.9	334.4	478.4	797.7	1247.1
34	Other Middle East	232.0	263.1	333.8	483.7	678.1	1124.2	1747.8
35	Turkey	199.3	246.2	313.1	456.8	646.5	996.6	1447.4
36	North Africa	241.9	299.0	372.9	329.0	723.7	1148.0	1716.1
37	South Africa	132.9	139.7	190.8	241.0	303.6	495.7	796.5
38	South East Africa	73.0	94.1	120.1	176.3	249.3	468.0	845.7
39	Other S.S.Africa	143.5	178.6	225.2	324.9	455.5	845.1	1515.1
40	Mexico	580.8	636.2	759.8	1015.1	1318.4	2004.1	2848.1
41	Other Central America	155.0	177.6	216.0	294.6	391.8	637.0	1066.0
42	Brazil	601.7	670.5	796.5	1076.3	1414.1	2358.1	3816.5
43	Venezuela, Guyana, Suriname	130.1	145.4	179.9	251.2	339.0	572.0	934.5
44	Paraguay, Uruguay, Argentina	311.9	343.3	432.6	586.1	777.4	1295.1	2108.3
45	Other South America	236.6	287.9	349.2	473.4	624.5	1042.4	1684.0
46	Russia	259.7	349.9	442.0	565.5	717.7	1248.8	2048.8
47	Other Annex I of FUSSR	56.0	81.3	99.0	122.3	149.7	257.3	416.4
48	Belarus	12.7	18.3	22.3	27.7	34.0	38.1	92.9
49	Kazakhstan	18.3	30.0	39.0	34.6	73.7	139.0	244.1
50	Other FUSSR	29.2	44.3	58.4	84.1	116.6	223.2	395.5
51	OECD E.Europe	276.0	325.4	403.0	519.3	655.5	1148.4	1886.8
52	Other Annex I of East Europe	107.8	136.5	169.6	215.2	269.0	468.5	763.0
53	Other E.Europe	22.2	27.8	35.1	46.4	60.2	108.8	184.1
	World Total	31728.2	36281.5	42907.1	58376.1	76110.2	95844.8	121464.3