2052 - A Global Forecast for the Next Forty Years

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12 scenarios for the 21st century
Limits Scenario 1: Resource crisis

1: Population
2: Food output
3: Industrial output
4: Pollution level
5: Nonrenewable resources

Source: Meadows, Randers and Meadows, LTG 30 year update, 2004
**Limits Scenario 9: Sustainability**

1: Population

2: Food output

3: Industrial output

4: Pollution level

5: Nonrenewable resources

Source: Meadows, Randers and Meadows, LTG 30 year update, 2004
My perspective: A small and fragile world
Overshoot: Emissions is twice absorption

Source: Global Carbon Project, Carbon Budget 2009
For all numerical data and the forecast model, consult the book website www.2052.info
The five regions used in the 2052 forecast

<table>
<thead>
<tr>
<th>Region</th>
<th>Population 2010 (billion people)</th>
<th>GDP 2010 (trillion $ pr year)</th>
<th>GDP per person 2010 (1000 $ pr person-year)</th>
</tr>
</thead>
<tbody>
<tr>
<td>US</td>
<td>0.3</td>
<td>13</td>
<td>41</td>
</tr>
<tr>
<td>China</td>
<td>1.3</td>
<td>10</td>
<td>7</td>
</tr>
<tr>
<td>OECD-less-US (1)</td>
<td>0.7</td>
<td>22</td>
<td>30</td>
</tr>
<tr>
<td>BRISE (2)</td>
<td>2.4</td>
<td>14</td>
<td>6</td>
</tr>
<tr>
<td>ROW (3)</td>
<td>2.1</td>
<td>8</td>
<td>4</td>
</tr>
<tr>
<td><strong>Sum world</strong></td>
<td><strong>6.9</strong></td>
<td><strong>67</strong></td>
<td><strong>10</strong></td>
</tr>
</tbody>
</table>

(1) Old industrial world, including EU, Japan, Canada, Australia, New Zealand etc  
(2) Brazil, Russia, India, South Africa and the ten biggest emerging economies  
(3) The remaining ca 140 countries of the world
World population will peak in 2040

Figure 4-1 Population – World 1970 to 2050

Source: Jorgen Randers, 2052, Chelsea Green, Vermont, May 2012
World GDP growth will slow down

Figure 4-3b: Gross Domestic product – World 1970 to 2050

Definition: GDP = Population aged 15 to 65 years multiplied with Gross labour productivity

Source: Jorgen Randers, 2052, Chelsea Green, Vermont, May 2012
Share of GDP in investment will grow

Figure 4-4: Production and Consumption – World 1970 to 2050

Source: Jorgen Randers, 2052, Chelsea Green, Vermont, May 2012
Energy use will peak in 2040

Figure 5-1: Energy Use – World 1970 to 2050

Energy intensity = Energy use per unit of GDP (scale →)

World energy use (← scale)

World GDP (scale →→)

Source: Jorgen Randers, 2052, Chelsea Green, Vermont, May 2012
Fossil fuels will prevail

**Figure 5-2: Energy Uses – World 1970 to 2052**

Source: Jorgen Randers, 2052, Chelsea Green, Vermont, May 2012
World CO₂ emissions will peak in 2030

Figure 5-3: CO2 Emissions from Energy Use – World 1970 to 2050.

Source: Jorgen Randers, 2052, Chelsea Green, Vermont, May 2012
Temperature and sea-level will rise

Figure 5-4: Climate Change – World 1970 to 2050

Source: Jorgen Randers, 2052, Chelsea Green, Vermont, May 2012
Food will satisfy demand – but not need

Figure 6-1: Food Production – World 1970 to 2050

Source: Jorgen Randers, 2052, Chelsea Green, Vermont, May 2012
Figure 6-2: Biological Capacity – World 1970 to 2050

- **Total biocapacity** (←scale)
- **Non-energy footprint** (←scale)
- **Unused biocapacity per person** (scale →)

Source: Jorgen Randers, *2052*, Chelsea Green, Vermont, May 2012
Average disposable income – 1970 to 2050

(in 2005 PPP $ per person-year)

Source: Jorgen Randers, 2052, Chelsea Green, Vermont, May 2012
Main conclusion from 2052

- World population and economy will grow more slowly towards 2052 than most people expect - but still fast enough to trigger a climate crisis

- World society will spend much money repairing climate damage after it has occurred - instead of spending it up front reducing climate gas emissions
Democratic decision making takes time
What should be done? – Globally

1. Slow population growth: Have fewer children, particularly in the rich world

2. Reduce the footprint: Eliminate fossil fuels, first in the rich world

3. Help the poor: Build a climate-friendly energy system in the poor world

4. Temper short-termism: Establish supra-national institutions

5. Establish new goals for rich society: Higher wellbeing in a world without growth
What is the role of standardisation?

1. Be a supplement to national regulation and supranational institutions in an effort to reduce greenhouse gas emissions

2. Help introduce solutions that are better – even if they are more expensive than the alternative

3. Establish goals for energy intensity (energy per GDP) and climate intensity (CO2 per energy) and ensure systematic progress towards these goals

4. At all levels, just like in past efforts to increase quality
I don’t like what I see!