Terrestrial Mammal Biomass 10,000 Years Ago

Wild Mammals 99%

Humans <1%
Terrestrial Mammal Biomass 1900

- Cattle: 40%
- Other Livestock: 21%
- Humans: 22%
- Wild Mammals: 17%

Source: Vaclav Smil 2016
Terrestrial Mammal Biomass 2000

- Cattle: 44%
- Other Livestock: 22%
- Humans: 31%
- Wild Mammals: 3%

Source: Vaclav Smil 2016
Terrestrial Mammal Biomass 2015

- Cattle: 45%
- Other Livestock: 22%
- Humans: 32%
- Wild Mammals: 1.5%

Source: Vaclav Smil 2016
HOW'S IT GOIN'?
### Criteria for a convivial science/technology

<table>
<thead>
<tr>
<th><strong>CONVIVIAL SCIENCE/NATURAL PROCESSES</strong></th>
<th><strong>CONVENTIONAL INDUSTRIAL SOCIETY</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Driven by solar energy</td>
<td>Driven mainly by stored fuel, fossil or biomass</td>
</tr>
<tr>
<td>2. Works in cycles</td>
<td>Works linearly</td>
</tr>
<tr>
<td>3. All materials are recycled, there is no waste</td>
<td>Resources are consumed to waste</td>
</tr>
<tr>
<td>4. Competition and Co-operation in ecosystems</td>
<td>Conquest by over-riding natural systems</td>
</tr>
<tr>
<td>5. No great excesses</td>
<td>Large excesses</td>
</tr>
<tr>
<td>6. Increases biological diversity</td>
<td>Decreases diversity</td>
</tr>
<tr>
<td>7. Global stability</td>
<td>Global changes</td>
</tr>
<tr>
<td>8. Multiple feed-back controls, mostly negative</td>
<td>Little feed-back control, mostly positive</td>
</tr>
</tbody>
</table>
Two Sciences

- **CONVENTIONAL** is the dominant history
- **CONVIVIAL** is the new enlightenment