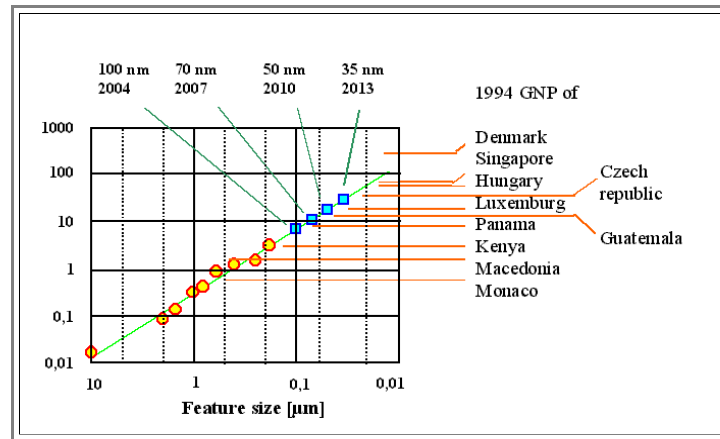


## Costs of Chip Production

### Illustration

This graph shows the development of the costs for developing a new chip generation (including the investments needed for building the factory) in comparison to the gross national product (GNP) of some nations.



There is an exponential increase in cost!

- While a **1 Mbit DRAM** (**1,0 µm** technology, about **1990** vintage) could be had for as little as **\$ 2.000.000.-**, the **1 Gbit DRAM** (**0,1 µm** technology, available in about **2003**) will run up a bill of about **\$ 7.000.000.000.-**
- Compare this to the gross national product of some countries and you will see that "globalization" is more than a catch word for high-tech products!

Here the latest news that fits right in with the table above

- From **Oct. 2002**

#### Intel Opens \$2B New Mexico Fab

Online staff -- 10/23/2002 **Semiconductor International**  
Electronic News

Intel Corp. today announced the opening of a **\$2 billion dollar** expansion to its manufacturing facility in Rio Rancho, N.M., adding 200,000 square feet of clean room space.

Designated Fab 11X, the plant will produce microprocessors on 300mm wafers using 0.13-micron process technology and will transition to 90nm process technology in 2003, Intel said.

"As computing and communications devices converge, the need for increasingly complex components with more capabilities will grow," said Paul Otellini, Intel's president and COO. "This facility will help us meet that growing demand. The combination of the 300mm wafers and 90-nanometer process technology will also reduce the costs of manufacturing, increase productivity and improve the availability of the world's most advanced semiconductor products."

In addition, Intel said that from an environmental perspective, water and chemical use will be more efficient at the plant, claiming that when compared to a 200mm facility, Fab 11X will produce 48 percent less volatile organic compound emissions, use 42 percent less ultra pure water and will use about 40 percent less energy.

- From **Oct. 2003**

#### **Semiconductor International**, Oct. 2003

It seems that hardly a day passes without a new announcement about the cost or economics of 300 mm wafer fabs: "\$7.0 billion dollars estimated revenue to support a 300mm fab,"<sup>1</sup> "**Leading-edge fab costs soar to \$4 billion**,"<sup>2</sup> "Prices for 300 mm wafers remain too high, says analyst,"<sup>3</sup> "Revamping 200mm fabs will have a significant cost advantage over new 300mm facilities for some products for some time."<sup>4</sup>

- From **July 2005**

#### **Solid State Technology**, Aug. 2005

Intel Corp., Santa Clara, CA, announced on July 25 that it will build its sixth and newest 300mm/45nm fab at the site of its Chandler, AZ operation. Construction will begin immediately on the **\$3.0 billion**, 1.0 million sq. ft Fab 32 facility, with production slated for 2H07. Intel operates four 300mm fabs in the US and Ireland, with a fifth expected to begin operations later this year -- a \$2 billion conversion of an existing 200mm fab, also in Chandler.