

Miguel Gomez

I'm a lousy employee.

# My Engineering Creed

- Do what you like, like what you do.
  - Consulting leads to engineering enlightenment.
  - Consulting leads to unintended opportunities.

# My Opportunities

- 1992
  - Upgraded PC and found memory doesn't fit. Started a memory adapter company.
- 1999
  - Implemented a TCP/IP stack in hardware. Helped start a network company.
- 2006
  - Designed a power supply, started a solar company.

# Missed Opportunities

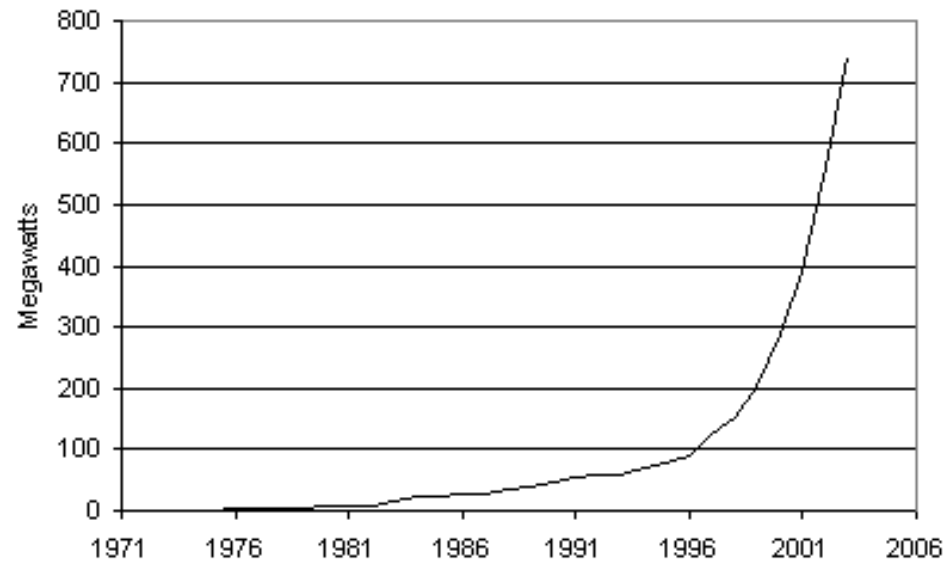
- 1994
  - Helped a friend switch IP addresses on Sun workstations.
  - He came up with the idea of Network Address Translation, built a company around it and sold it to Cisco in 1 year for 32 million.
  - He is now investing in my solar venture.

# How have I Discovered the Great Ideas?

- Not through brainstorming.
- Not through the news.
- But by running smack into the problem several times before recognizing it.
- Then I run hard before the market window closes.

# Why Solar

World Photovoltaic Shipments, 1971-2003



Source: Paul Maycock

- Solar will be a 50 billion dollar industry in 2010.

# Why Solar

- **Country Year Incentive**
- **Japan 1992 New Sunshine Program:** Established to introduce renewable energy throughout the country. Targets were set and a net metering law enacted.
- **Japan 1994 70,000 Roofs Program:** Initially, 50 percent of PV installation costs were subsidized and the annual budget (for R&D and market incentives) was \$18.3 million. In 2003, the subsidy was reduced to 15 percent and the budget allocation increased to \$186 million.
- **United States 1997 Million Solar Roofs Initiative:** National program designed to facilitate the installation of solar energy systems on one million U.S. buildings by 2010.
- **Germany 1998 100,000 Roofs Program:** Provided 10-year loans with reduced interest rates to buyers of PV systems. It ended early, in 2003, when all targets were met.
- **Germany 1999 Renewable Energy Sources Act (Feed-In Tariff):** Customer applications receive 56¢ per kWh for solar-generated electricity sold back to the grid.
- **Italy 2001 10,000 Roofs Program:** Regions offer different investment subsidies to promote building-integrated photovoltaic applications.
- **Japan 2003 Renewable Power Portfolio Standard:** Requires that renewable energy be provided at a constant percentage of the electric power supply. This legislation aims for renewable energy to be 3.2 percent of the total by 2010.
- **China 2004** Allocation of \$1.21 billion to adopt solar and wind energy for power generation in remote areas of West China.
- **Sources:** Arnulf Jager-Waldau, **PV Status Report 2003** (Ispra, Italy: September 2003); Paul Maycock, "China PV Booming," **Photovoltaic News**, May 2004; Jane Pulaski and Larry Sherwood, "Power Roofs," **Solar Today**, July/August 2004, pp.36-39; Janet L. Sawin, **Mainstreaming Renewable Energy in the 21st Century**, Worldwatch Paper 169 (Washington, DC: Worldwatch Institute, May 2004).

# Why Solar

- Energy costs vs. solar costs cross over in 5 years.
- Cost of solar silicon: \$250/Kg.
- Contract cost of silicon: \$30/Kg.
- Silicon sets the cost of solar energy.



# Winners and losers

- Winners:
  - Silicon wafer manufactures.
  - 97 wafer manufactures world wide.
- Potential losers:
  - Late to market panel manufactures.
  - Over 400 panel manufactures world wide.

# What is ActSolar

- A solar array management company.



# How do I fund my ideas?

- Contract engineering
- Expert Witness patent work.
- Spoils of previous start-up successes.
- If it wasn't for consulting work I would never have started.